Impact of outreach on financial performance of microfinance institutions: A moderated mediation model of productivity, loan portfolio quality, and profit status

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Abstract

Agency theory posits that the profit orientation of firms influences their social and organisational performance. However, due to the extensive heterogeneity of lending organisations operating in the microfinance industry, there is no general agreement in the literature on how profit orientation affects social and organisational outcomes of microfinance institutions (MFIs). In this paper, we contribute to this debate by analysing whether the relationship between outreach and financial performance of MFIs is mediated by their productivity and loan portfolio quality, and, separately, whether this relationship is moderated by their profit orientation. To this end, a partial least squares (PLS) multi-group analysis is applied to a worldwide sample of 435 MFIs. First, we find substantial differences in the business model among non-profit-oriented and profit-oriented lenders, but the findings also reveal that both types of MFIs can increase their outreach while improving their financial outcomes. Essentially, the analysis shows a negative direct effect of outreach on financial performance for non-profit lenders, but we also find that this negative effect is positively mediated via productivity and portfolio quality of non-profit lenders which leads to a positive overall impact of outreach on financial performance. Hence, our findings do not support the mission drift hypothesis popular in the microfinance literature. On the contrary, the results suggest that non-profit-oriented lenders achieving higher levels of productivity and loan portfolio quality can additionally obtain better financial outcomes.

Keywords: *Profit orientation; Mission drift; Moderated mediation; Multi-group analysis; Partial least squares.*

JEL codes: G21, M16.

1. Introduction

The microfinance industry was born to supply banking services –mainly by lending small loans known as microcredits- to the poorest people who have no access to the traditional banking system. Since its inception, microfinance has been funded by governments and donors, and was considered a major instrument of development and poverty alleviation due to the fact that this sector funds the creation and growth of the very small businesses whose owners are people excluded socio-economically (Tavanti, 2013). Indeed, Mair & Marti (2006) consider that the microfinance is a social entrepreneurship industry since it integrates the creation of both economic and social values with a worldwide presence, which allows social change to be catalysed and/or social needs to be addressed (Carraher, Welsh & Svilokos, 2015).

Nevertheless, in recent years, donors have been sharply cutting their funds towards microfinance institutions (henceforth, MFIs), and a new trend (known as *"commercialization of microfinance"*) is emerging that forces MFIs to become financially self-sufficient (Mersland & Strøm, 2010). Nowithstanding, this increased focus on financial goals is steering MFIs away from their original mission, that of serving the poorest people, thereby raising the phenomenon known as *"mission drift"* (Copestake, 2007). Consequently, in the current context, the MFIs have to be managed in order to attain two essential objectives - known as the *"double bottom line"*, Morduch (1999)-: to serve the many poorest people (i.e., to have the greatest outreach) while becoming financially sustainable (Aggarwal, Goodell & Selleck, 2015; Quayes, 2012, 2015). As suggested by Battilana & Dorado (2010), "MFIs therefore are hybrid organisations that combine two separate logics: a *development* logic that guides their mission to help the poor, and a *banking* logic that requires profits sufficient to support ongoing operations and fulfil fiduciary obligations."

Accordingly, the recent literature has been dealing with the effects that the double bottom line is provoking on the performance of the MFIs, since certain researchers (e.g., Armendáriz & Szafarz,

2

2011; Cull, Demirgüç-Kunt & Morduch, 2011) suggest that financial and social objectives seem to be in conflict. Nevertheless, regardless of whether there is a trade-off between outreach (O) and financial performance (FP) of MFIs, there remains an open research question on which the literature continues to debate intensively.

On the one hand, the traditional banking argument supports a negative relationship between social and financial objectives, since poorer borrowers may have higher default rates and higher screening, monitoring and enforcement costs, which in turn increases the total cost per dollar lent (Copestake, 2007; Cull, Demirgüç-Kunt & Morduch, 2007; Hermes, Lensink & Meesters, 2011; Hudon, 2010; Morduch, 2000; Otero & Rhyne, 1994; Von Pischke, 1996). Conversely, on the other hand, others authors suggest that lending to people from the bottom of the pyramid (BoP) decreases the information costs, adverse selection, and moral hazard and increases the use of social collateral, mainly in the form of encouraging group lending and close relationships with the customers in order to become better acquainted with the local networks and mechanisms (Goldmark, 2001; Woolcock, 2001). Consequently, these researchers support a positive relationship between outreach and MFIs´ financial performance (Gutiérrez-Nieto, Serrano-Cinca & Molinero, 2007; Louis, Seret & Baesens, 2013; Mersland & Strøm, 2010; Quayes, 2012).

Based on the above two lines of thought, not only must the MFIs take into account the customers´ characteristics but also their own idiosyncrasy and mission when their social and financial performances are analysed. In this sense, the profit orientation of the MFI substantially determines their management model and business strategies, and thus their financial performance and outreach.

According to the agency theory (Fama & Jensen, 1983; Jensen & Meckling, 1976), the profit orientation of the MFI influences the relationship between their outreach and financial performance, although the effects may be opposing. In this vein, there are agency costs caused by the separation of ownership and control, which can be minimized depending on the composition of the ownership. Indeed, profit-oriented MFIs have owners with pecuniary incentives and are more able to reduce agency costs. As a result the ownerless non-profit organisations have higher agency costs (Mersland & Strøm, 2009). Nevertheless, agency theory also predicts that non-profit-oriented MFIs can have an offsetting benefit of reducing customer adverse selection and moral hazard (Mersland & Strøm, 2009),

since they may be closer to the customers and better able to tap into local information networks. Moreover, the principal-agent relationship applied to the MFI and its donors shows that donors may have more problems entrusting their money to profit-oriented MFIs, and, thus the agency costs should be lower for non-profit-oriented MFIs.

Finally, a derivation of the theory of ownership of enterprise framed by Hansmann (2009) suggests that non-profit organisations operate better in imperfect markets, such as the microfinance (Mersland & Strøm, 2009).

Hence, despite of the fact of that theory does not clearly find how profit orientation of MFIs influences in the relationship between outreach and financial performance of MFIs, it does uphold taking into account the organisational characteristics of the MFIs (such as the ownership and the profit orientation) in order to analyse the relationships between these two above key dimensions of these lending organisations.

In this framework, this study tests whether the relationship between outreach (O) and financial performance (FP) of the MFIs is mediated by their productivity (CPPS) and loan portfolio quality (PQ), and moderated by their profit orientation. By segmenting the sample into two sub-samples, profit-oriented MFIs and non-profit-oriented MFIs, we explore the differences between these groups in order to evidence if the management of both types of lending organisations must be based in different business strategies, or not.

To this end, partial least squares path modelling (hereinafter, PLS) is applied on a dataset collected from the Microfinance Information Exchange database (MIX Market), which contains a worldwide sample with 435 MFIs for the year 2014.

PLS is a highly suitable statistical technique for theory building (Chin, 2010). Given that there is neither general agreement in the microfinance literature concerning the sign of the relationship between O and FP nor regarding the indirect effects that CPPS and PQ may exert in the above relationship, PLS seems to be the most suitable analytical method for the establishment of a valid theory on these issues.

PLS is becoming a trendy model whose capabilities are being exploited by researchers across a wide range of disciplines. Research on accounting and finance by applying PLS can be found in

literature (Lee, Petter, Fayard & Robinson, 2011; Nitzl, 2016). Although the finance discipline hardly exploits the advantages of this methodology, Avkiran (2018) shows that PLS can be used in finance for prediction and exploration in complex models since this methodology is useful in identifying relationships between constructs. More specifically, PLS has a wide spectrum of practical applications to managerial challenges, and is considered one of the most salient methods in business research (Babin, Hair & Boles, 2008).

PLS is a non-parametric, multivariate approach based on iterative ordinary least squares (OLS) regression to estimate models with latent variables and their directed relationships. Latent constructs are directly unobservable phenomena but they can be measured indirectly through several indicators. PLS either uses correlation weights or regression weights to determine the scores that serve as proxies for the theoretically established constructs (Avkiran, 2018). This approach is especially useful for creating composite indicators based on multiple outputs expressed in different measurement units, and it allows for enterprise specific weighting of the different objectives. Indeed, in the microfinance literature there is a call to deal with composite variables since the measurement of the performance of hybridising organizations combine dual aspects: social and financial (Staessens, Kerstens, Bruneel & Cherchye, 2018). Our research makes a two-fold contribution to the extant literature. Firstly, in order to analyse the impact of outreach on the financial performance of the MFIs, our study includes two innovative variables: commercial productivity and loan portfolio quality. To date, the literature has only studied this relationship focused on direct effects, and has not yet explored the indirect relationships. Secondly, to deal with the wide heterogeneity of lending organisations that operate in microfinance, we also analyse the role of the profit orientation of the MFIs. Although the impact of profit status on the financial performance of the MFIs has already been studied, our contribution involves analysing the direct and mediating effects by means of multi-group PLS methodology.

This paper proceeds as follows. Section 2 provides an overview of the literature on financial performance and outreach of MFIs, and, at the same time, establishes the research hypotheses. Section 3 explores the data and methodology used. Section 4 summarizes the main empirical results and discusses the study's limitations and practical implications. Lastly, Section 5 concludes with the contribution of this research.

2. Literature review and hypotheses

2.1. *The dual mission of microfinance institutions: Outreach and financial performance*

Although, as affirmed by Agier & Szafarz (2013) and Serrano-Cinca & Gutiérrez-Nieto (2014), there is no widespread consensus on the ideal variable to measure the social performance (or outreach) of MFIs, several proxies of both dimensions of outreach, namely, the level of exclusion of the borrowers (i.e., depth of outreach) and scope of the population served (i.e., breadth of outreach) are suggested by the literature as a useful approximations (Assefa, Hermes & Meesters, 2013; Tchakoute-Tchuigoua, 2010).[1]

Based on these two dimensions of outreach (depth and breadth), a high heterogeneity of microfinance organisations arise that operate in one of these two mission groups: (i) commercial or profit-oriented MFIs; and, (ii) social or non-profit-oriented MFIs (Servin, Lensink & van den Berg, 2012). This duality that characterizes the MFIs is strongly linked to their profit orientation since owners with greater pecuniary incentives foster a business management that is more oriented towards commercial and financial objectives than socially committed property structures (such as social MFIs).

The researchers who advocate profit-oriented MFIs therefore suggest that greater outreach results in lower financial performance. From a theoretical view, they argue that lending microcredits to the poorest-of-the-poor is highly expensive due to the relatively high unit cost of the small loans as a consequence of their greater need for business training, technical advice, mentoring, and also personnel support, among others (Brau & Woller, 2004; Conning, 1999; Navajas, Schreiner, Meyer, Gonzalez-Vega & Rodriguez-Meza, 2000; Schreiner, 2002; Von Pischke, 1996). Accordingly, profit-oriented MFIs note that their target market is in the upper strata of the poverty pyramid, but not in the

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[1] Note that *depth of outreach* refers to reaching the poorest clients whilst *breadth of outreach* is the scope or magnitude of the impact that a MFI has in its target market.

BoP, since reaching the poorest people comes at a price: worse financial results (Louis et al., 2013). Indeed, Cull et al. (2007) find that lenders who try to become (or are) financially sustainable, focus on granting larger loans and thus, eventually target the less poor. These findings are in consonance with the strategy of the profit-oriented MFIs which emphasize reaching greater financial performance by means of the promotion of the economies of scale, diversification of credit risk between a large number of borrowers, efficiency, and technological innovations, whereby social goals remain on a secondary plane. That is, the researchers who are aligned to this approach, known as *"institutionalists"*, believe that serving a large number of non-BoP borrowers by means of a higher loan size is the only way to alleviate poverty while remaining financially self-sustainable (Montgomery & Weiss, 2011). In other words, profit-oriented MFIs advocate for a business model based on reaching a great breadth of outreach, instead of operating with a large depth of outreach, since commercial MFIs supply customers who are more profitable, that is, primarily urban, less poor, and male (Copestake, 2007; Cull et al., 2007).

In contrast to institutionalists, the so-called *"welfarist"* approach emerges. Welfarist authors support the non-profit-oriented MFIs and argue that social objectives have to prevail over economic results since they are the origin and primary mission for which the microfinance sector was created. Accordingly, the non-profit-oriented MFIs are focused on the BoP target market, and strive to reach as many people as possible (i.e., a great breadth of outreach), preferably women from rural areas, by lending very small loans (i.e., a great depth of outreach), usually under solidarity group-lending methodology. Indeed, welfarist researchers uphold that achieving a greater outreach does not necessarily cause a detriment in the financial performance of MFIs. For instance, Gutiérrez-Nieto, Serrano-Cinca & Molinero (2009) suggest that MFIs that perform well on the outreach dimension are also financially efficient. Along the same lines, Mersland & Strøm (2010) find that cost-effective MFIs grant smaller loans. Quayes (2012) and Louis et al. (2013) also show a positive relationship between outreach and financial self-sufficiency. Nevertheless, certain non-profit-oriented MFIs assume the role of mere channellers of funds donated by public administrations and private donors, and therefore depend on these funds to keep on development of their activity. As stated by Roberts

(2013), the business model of the majority of these MFIs is based on the reception of subsidies that are then lent to people at the BoP.

Therefore, since there is no general agreement in the microfinance literature regarding the relationship between outreach (O) and financial performance (FP), we follow the traditional banking literature that suggests that lending small loans to the poorest people results in lower financial performance due to the higher credit risk and relatively higher unit cost.

Hypothesis 1: There is a negative relationship between outreach of the MFIs and their financial performance, independent of their profit orientation.

2.2. Mediating role of loan portfolio quality and commercial productivity

Supporters of the welfarist approach argue that, due to their in-depth knowledge of the local social networks, their close and confident relationships with their poorest customers, and to the use of a solidarity group-lending methodology and social collateral (Paal & Wiseman, 2011; Quidt, Fetzer & Ghatak, 2016), the non-profit-oriented MFIs have lower information costs, adverse selection, and moral hazards, which enhances the quality of their loan portfolio and decreases the costs linked to the problems of information asymmetry (Feigenberg et al., 2013). We consider that both the loan portfolio quality (PQ) and the saving costs (or commercial productivity in the provision of the service, here after, CPPS) provide the theoretical foundations upon which to lay the business model of the non-profit-oriented MFIs. For this reason, both PQ and CPPS emerge as two relevant dimensions that must be considered when the relationship between O and FP is analysed, since they may strongly influence this relationship although the sign of the influence may differ depending on the profit orientation of the MFI.

Therefore, in order to analyse these assumptions in greater depth, the mediating effect via PQ and CPPS is also analysed in this paper.

2.2.1. The mediation via commercial productivity in the provision of the service

2.2.1.1. Relationship between outreach and commercial productivity

Whilst non-profit-oriented MFIs strive to maximize their outreach by lending a great number of very small loans to the people (preferably women) from the BoP (Cull et al., 2007), profit-oriented MFIs try to maximize their outreach through lending numerous larger loans to people from a higher strata than that of the BoP (Quayes, 2012). Consequently, since the objective of each of the two approaches is to maximize their outreach by lending a great number of microcredits, the differences arise in the loan size and the level of poverty of the customers. However, we expect that outreach and commercial productivity are positively related in both types of MFIs although due to different causes. On the one hand, employees of profit-oriented MFIs have a greater economic incentive to increase the loan portfolio under their management than employees from non-profit-oriented MFIs. On the other hand, the social commitment of the staff of non-profit-oriented MFIs is stronger, and therefore these employees become more involved in the actual lending process.

Thus, the first part of the second hypothesis states:

Hypothesis 2.1: Independent of the profit orientation of the MFIs, there is a positive relationship between the outreach of the MFIs and their commercial productivity.

2.2.1.2. Relationship between commercial productivity and financial performance

A positive relationship between the commercial productivity of any organisation and its financial results is widely accepted in the literature, which is also valid for the microfinance sector. In this case, no substantial differences in the relation between CPPS and FP depending on the profit orientation of MFIs are expected due to the lack of theoretical basis in this regard. Consequently, based on logic and previous research, the second part of our second hypothesis states:

Hypothesis 2.2: Independent of the profit orientation of the MFIs, there is a positive relationship between the commercial productivity of the MFIs and their financial performance.

To sum up, by considering the whole effect of both $H_{2.1}$ and $H_{2.2}$, we establish the second hypothesis (H_2), which tests the mediating role of O on FP via CPPS, assuming that CPPS provides a positive mediating effect for both non-profit-oriented and profit-oriented MFIs. Thus, the second hypothesis states:

Hypothesis 2: The relationship between the outreach of MFIs and their financial performance is positively mediated by the commercial productivity of these lending institutions, independent from the profit orientation of the MFIs.

2.2.2. The mediation via loan portfolio quality

2.2.2.1. Relationship between outreach and loan portfolio quality

According to the literature and the principles on which the microfinance is based, we expect that an increase of the outreach of the MFIs should have positive effects on their loan portfolio quality. Indeed, this is the model on which the microfinance industry was born, and is known worldwide as the "Grameen Model", promulgated by the Nobel Peace Prize-winner, Mohammed Yunus. His idea is reflected in this sentence: "when a small loan is lent to the poorest people, preferably women without requiring any collateral, it is borrowed based on trust conditions and, in the great majority of the cases, is repaid" (Agier & Szafarz, 2013; d´Espallier, Guérin & Mersland, 2011). Under the belief that depth of outreach and portfolio quality are positively linked, Yunus created the Grameen Bank in Bangladesh in 1983 which has substantially contributed towards reducing poverty of the poorest people from rural areas in that country (Khandker, Khalily & Khan, 1995; Sharma & Zeller, 1997). In this vein, several empirical research studies support the above assumptions, such as that by Agier & Szafarz (2013), Cull et al. (2007) and d´Espallier et al. (2011), who reveal that an increase in the monitoring tasks of MFIs carries out an improvement in their portfolio quality.

However, note that nothing is said about the breadth of outreach in the above presumptions of the "Grameen Model". The increase of the number of customers served is an objective of any organisation, even more so in the microfinance industry, where potential customers are left financially unattended, thereby leaving them deeper in their situation of poverty. We consider that non-profit-

oriented MFIs would have higher portfolio quality than profit-oriented MFIs since social MFIs have a greater depth of outreach because they are focused on BoP customers, preferably women, while commercial MFIs reach a higher stratum than BoP. In other words, the relationship between O and PQ is influenced by the profit orientation of the MFI, whereby it is expected that this relationship would be stronger for the profit-oriented MFIs.

The microfinance literature suggests that the differences between profit-oriented and non-profit-oriented MFIs regarding the O-PQ relationship arise from three main sources linked to the different levels of depth of outreach performed by each type of MFI. Firstly, there are the lower asymmetric information problems supported by non-profit-oriented MFIs. These institutions, in addition to providing loans, offer their customers training and advice services, which foster confident relationships and a deep knowledge of the local social networks and idiosyncrasy of the customers. This decreases the information costs, adverse selection, and moral hazard, while decreasing the loan portfolio credit risk assumed by lenders (Ghosh & Van Tassel, 2013).

The second cause is related to women borrowers. Women are mostly served by the social MFIs since targeting women is considered a burden to the sustainability of the MFIs, and therefore, in order for women to become a target market for commercial MFI, they must constitute a profitable market opportunity (d'Espallier, et al., 2013). However, the literature suggests that women invest in types of businesses that allow easier repayment, since they are more risk averse than men (Croson & Gneezy, 2009; Niederle & Vesterlund, 2007) and often perform less aggressive strategies and sustainable investment criteria (Apesteguia, Azmat & Iriberri, 2012). In this sense, d´Espallier et al. (2011) show that MFIs with a greater female focus exhibit better repayment performance and lower credit risk. Moreover, in developing countries,women have fewer credit opportunities than men (Duflo, 2012) and must repay their loans to ensure continued access to credit, that is, they have higher social collateral (Armendáriz & Morduch, 2010), which also favours the higher rates of repayment by women.

The third cause is linked to the solidarity group-lending and the social collateral, which are often used in BoP target by non-profit-oriented MFIs. The microfinance literature finds that the peer monitoring, group pressure, and social ties that arise in solidarity group-lending reduce delinquency (Al-Azzam, Hill & Sarangi, 2012; Cassar& Wydick, 2010). Some researchers (e.g., Woolcock, 2001)

affirm that social collateral behave better in BoP context since it works through higher negative effects on personal reputation and social standing than the non-repayments of the microcredits provoke on the borrowers, which is specially effective in less developed environments.

Accordingly, we assume that the relationship between outreach and loan portfolio quality (O-PQ) would be higher in non-profit-oriented than in profit-oriented MFIs. Consequently, we expect that there will be a substantial difference in the relationship between outreach and portfolio quality depending on the MFI´s profit orientation. Thus, the first part of our third hypothesis states:

Hypothesis 3.1.a: For non-profit-oriented MFIs, the higher outreach, the higher loan portfolio quality.

Hypothesis 3.1.b: For profit-oriented MFIs, the higher outreach, the lower loan portfolio quality.

2.2.2.2. Relationship between loan portfolio quality and financial performance

The financial performance of any financial lending institution is also highly influenced by the quality of its portfolio (Angbazo, 1997). When the portfolio quality is low, an adequate management of the financial institution may not result in high financial performance since there is a high probability of losing the money lent. Default losses not only reduce the profit of lenders but also substantially decrease their volume of equity, thereby leading to more capital requirements. The same step-by-step procedure occurs in the microfinance industry and, consequently, the control of the portfolio quality becomes a critical business factor in guaranteeing the survival and growth of MFIs. Accordingly, Mersland & Strøm (2009), and Quayes (2012) show that, in the field of microfinance, the relationship between the loan portfolio quality and financial performance of MFIs is also positive, without differences in function of profit orientation of MFIs. Therefore, we do not expect a different behaviour between non-profit-oriented and profit-oriented MFIs with respect to the relationship between PQ and FP, stating the second part of our third hypothesis:

Hypothesis 3.2: Independent of the profit orientation of the MFIs, there is a positive relationship between loan portfolio quality of the MFIs and their financial performance.

Lastly, by aggregating the $H_{3.1.a/b}$ and $H_{3.2}$ we define the third hypothesis (H_3). Due to the negative relationship between O and PQ for non-profit-oriented MFIs ($H_{3.1.a}$) and positive for the profit-oriented MFIs ($H_{3.1.b}$), we expect that the mediating role between O and FP via PQ is substantially different for both groups, which leads to the third hypothesis:

Hypothesis 3.a: For non-profit-oriented MFIs, the relationship between outreach and financial performance is positively mediated by the loan portfolio quality.

Hypothesis 3.b: For profit-oriented MFIs, the relationship between outreach and financial performance is negatively mediated by the loan portfolio quality.

2.2.3. The sequential mediation via commercial productivity and loan portfolio quality

Finally, we also analyse the influence of the commercial productivity (CPPS) of the MFIs on their loan portfolio quality (PQ). At a first glance, it seems reasonable to think that a higher commercial productivity may imply lower portfolio quality. Nevertheless, we assume a positive sign between them since, in order to improve the portfolio quality, lenders often use automatic credit risk management models (such as credit-scoring models) and systematic procedures (such as credit-risk committees) that bring on a greater number of credit applicants studied (i.e., increase productivity) while reducing the credit risk (i.e., increase the portfolio quality) of the lenders. That is, standard procedures and automatic management credit-risk tools increase both the commercial productivity and portfolio quality of the lenders. Furthermore, we also expect to find that this positive relationship is stronger for commercial MFIs than for social MFIs since the former often use credit risk models and management tools that are more advanced and efficient than the latter, and consequently they can analyse many applicants in less time. Conversely, social (or non-profit) MFIs often spend a longer period of time due to the intrinsic characteristics of banking services, such as inseparability, intangibility, and labour

intensity (Roth & Jackson, 1995), on familiarising themselves with their potential borrowers in order to know their real needs, exclusion situations and social networks. In other words, the lending process of the non-profit-oriented MFIs is based on a deep knowledge of the personal, family, and business contexts of each credit applicant, and also on the existing permanent business training and advice service during the life of the loan, which is more difficult to automatize and requires individualized attention.

Therefore, we hypothesize that CPPS positively influences PQ, and state the first part of our fourth hypothesis:

Hypothesis 4.1: Independent of the profit orientation of the MFIs, there is a positive relationship between commercial productivity of the MFIs and their loan portfolio quality.

According to the aforementioned argumentation, our presumption is that outreach (O) and financial performance (FP) are primarily mediated through the commercial productivity (CPPS) of MFIs, and secondarily through their loan portfolio quality (PQ), thereby forming a sequential mediation that generates a three-path mediation model (Fig. 1b) (for more methodological details see, Taylor, MacKinnon & Tein, 2008; Nitzl, Roldan & Cepeda, 2016). Hence, connecting the previously shown relationships between O-CPPS ($H_{2.2}$), CPPS-PQ ($H_{4.1}$), and PQ-FP ($H_{2.2}$), our fourth hypothesis states:

Hypothesis 4: The commercial productivity and loan portfolio quality of MFIs sequentially mediate the relationship between outreach and financial performance of these lending institutions.

3. Data and research methodology

3.1. Dataset

The data on MFIs was collected from the Microfinance Information Exchange (MIX Market). After the elimination of cases with missing data and extreme values, our sample includes information for 435 MFIs around the world for the year 2014.

Table 1 provides an overall vision of the dataset, and distinguishes between non-profit-oriented and profit-oriented MFIs, which enables a comparison of the two groups. Accordingly, Table 1 shows that

non-governmental organisations (NGOs) and credit union are the two most common legal statuses used by non-profit-oriented MFIs, with 67.6% and 19%, respectively. Conversely, non-banking financial institutions (NBFIs) (71%) and banks (21.50%) are the most used statuses for profit-oriented MFIs. Consequently, as mentioned before, the profit-oriented MFIs are aligned with legal statuses that involve better control and decision-making than those of non-profit-oriented organisations. In accordance with Schreiner´s thesis (2002), our descriptive statistics show that non-profit-oriented MFIs display a higher depth of outreach but lower breadth than do profit-oriented MFIs. Similarly, the vast majority of profit-oriented MFIs are regulated (79.30%), in accordance with the need for raising funds from the commercialization of deposits. In contrast, only 45.20% of non-profit-oriented MFIs are regulated, which might be explained by the fact that these types of institutions are often funded by donors and public administrations. In relation to the rate of financial self-sufficiency, Table 1 indicates that non-profit-oriented and profit-oriented MFIs have similar percentages of financial sustainability (83.10% and 84.40%, respectively). Finally, the distribution of MFIs across various regions is similar in terms of the profit orientation of MFIs.

TABLE 1 HERE

3.2. Measures

3.2.1. Outreach

Following the literature (e.g., Mersland, Randøy & Strøm, 2011; Tchakoute-Tchuigoua, 2010), we use the two widely-accepted dimensions of outreach in order to measure the social performance of the MFIs: depth and breadth of outreach. On the one hand, following Assefa et al. (2013) and due to the multidimensional nature of the depth of outreach, we employ the four most commonly used indicators. Firstly, for the measurement of the level of outreach to customers at the BoP, the microcredit size is employed (i.e., the average loan balance per borrower in US dollars, adjusted by GNI per capita). Secondly, the representation of women in the total customer portfolio (i.e., the percentage of female borrowers) is considered, since women are the principal target population (Armendáriz & Morduch, 2010). Thirdly, since the populations from rural areas are often financially unattended and have lower

15

levels of socio-economic development, high MFI activity in rural areas means higher social performance. Fourthly, the percentage of loan portfolio lending under group methodology is included, since the lending-group methodology is mainly used with the poorest applicants who have no collateral in the granting of the loan. On the other hand, in accordance with a general agreement in the literature (e.g., Louis et al., 2013), we employ the number of active borrowers as a measurement of breadth of outreach.

All these indicators are employed to form the outreach construct. A first step in modelling the construct involves considering whether it is reflective (mode A) or formative (mode B), (MacKenzie, Podsakoff & Jarvis, 2005). The choice depends primarily on whether the items are viewed as either indicators or as causes of the factor (Chin, 1998). In our model, the formative (mode B) method of measuring outreach is adopted since the indicators generate higher outreach.

3.2.2. Financial performance

Return on assets (ROA) and other ratios or measures that compare income and expenses, are often calculated in order to estimate the financial performance of firms (Campbell & Mínguez-Vera, 2008). In this study, in order to measure the financial performance of MFIs, we use ROA, Profit Margin, and a dummy variable that takes value 1 when the MFI is operationally self-sufficient and 0 otherwise, whereby a reflective (mode A) approach is assumed since a high FP value implies a greater value of each indicator.

3.2.3. Loan portfolio quality

Several ratios associated to the credit risk and the practice of restructuring and refinancing loans are employed here to evaluate the loan portfolio quality. In line with the microfinance literature (e.g., Bogan, 2012; Gutiérrez-Nieto et al., 2007; Mersland & Strøm, 2009), we use the percentage of the portfolio that is non-overdue for more than 30 days and the percentage that represents the gross loan portfolio with respect to the loans written off (inverse of the write-off ratio). Since all these items are clearly the consequence and not the cause of the MFI´s loan portfolio quality, the reflective (mode A) method is adopted.

3.2.4. The commercial productivity in the provision of the service

Since microfinance is a highly-intense labour activity, the productivity of the employees managing microcredits is measured by means of three indicators linked to the number of loans and to the time employed in the provision of their service to the customers: (i) loans outstanding per staff member; (ii) the inverse of cost per loan outstanding; and (iii) loans per loan officer. Following the same reasoning previously set out for this construct, a reflective (mode A) approach is also adopted.

The descriptive statistics of all these indicators are shown in Table 2.

<div align="center">TABLE 2 HERE</div>

3.3. Partial least squares path modelling

Partial Least Squares (PLS) (Chin, 1998; Chin & Newsted, 1999; Chin & Todd, 1995; Lohmöller, 1989) is an approach to Structural Equation Models (SEM) that allows researchers to analyse, concurrently combining factor analysis and linear regressions, the relationships simultaneously between theory-based latent variables and their indicator variables by measuring directly observable indicator variables (Hair, Hult, Ringle, & Sarstedt, 2014). In order to estimate the model parameters PLS maximizes the variance explained for endogenous constructs by means of OLS regressions, or in others words, PLS algorithm aims to minimize the residual variances of the dependent variables (Chin, 1998).

In addition to PLS-SEM, the literature proposes several SEM models, where the covariance-based SEM (CB-SEM) is widely used. Nevertheless, PLS-SEM approach is theoretically superior to CB-SEM since do not require the presumption of normal distribution of data and enables retention of more indicator variables, and consequently it is more appropriate for first stage theory testing (Astrachan, Patel & Wanzenried, 2014). As suggested by Dijkstra (2010), PLS relaxes the demand on data and specification of relationships set by CB-SEM and, at the same time, requieres fewer observations than CB-SEM, working with relatively small sample sizes (Cassel, Hackl & Westlund, 1999) (for a detailed comparison of statistical basis of PLS-SEM and CB-SEM, see Reinartz, Haenlein & Henseler, 2009).

PLS also presents several characteristics which make it attractive to researchers such as neither produce inadmissible solutions nor suffer factor indeterminacy (Fornell & Bookstein, 1982) and additionally, there is no need of independent observations or identical distributions of residuals (Chin & Newsted, 1999; Lohmöller, 1989). These features justify the successful implementation of PLS in a wide variety of research fields where it is difficult to directly measure a dimension, such as marketing, management, accounting, and finance.

To implement the PLS, it is necessary to follow a two-stage procedure which results in the building of two models (Lohmöller, 1989). In the first stage, the measurement model is built which includes the relationships between the latent variables and their indicators. To this end, the scores of the latent constructs are iteratively estimated (reliability and validity of the measurement model). In the second stage, the final estimates of coefficients (outer weights, loadings, and path coefficients) are calculated using the OLS regressions for each partial regression in the model. The result of this second stage is the structural model, that is, the part of the overall model that proposes relationships among the latent variables (Roldán & Sánchez-Franco, 2012). The importance of the structural model is to show the effects tested with the research hypotheses, and consequently, it is the core of the PLS model.

FIGURE 1 HERE

Additionally, due to the wide heterogeneity of MFIs that characterize the microfinance industry, and in order to analyse the influence of profit orientation on the hypothesis propounded in this work and to compare the differences in parameter estimates when the same model is applied to different but related sets of data (non-profit-oriented versus profit-oriented MFIs), a multi-group analysis method is also applied in PLS (Rigdon, Ringle & Sarstedt, 2010; Sarstedt, Henseler & Ringle, 2011). In fact, when a multi-group comparison is performed, it is testing the moderator effect of a non-continuous (i.e., discrete) variable on the PLS model since the differences in the model parameters between the different data groups are interpreted as moderating effects (Henseler & Fassot, 2010). Note that, when performing PLS path modelling on an aggregate data level, the act of ignoring the population

heterogeneity may bias the results and, thereby, yield inaccurate management conclusions (Sarstedt, Schwaiger & Ringle, 2009).

To perform our analysis, the PLS algorithm (Tenenhaus, Esposito-Vinzi, Chatelin, & Lauro, 2005) was applied using the SmartPLS software version 3.0.

4. Results and discussion

4.1. Measurement model

According to Roldán, Leal-Rodriguez & Leal (2012), the measurement model for reflective (mode A) constructs is assessed in terms of individual item reliability, construct reliability, convergent validity (Table 3), and discriminant validity (Table 4).

Firstly, individual item reliability is considered valid when an item has a factor loading greater than 0.7 (although certain authors accept a threshold of 0.60); this implies that the shared variance between the construct and its indicators is greater than the error variance (Carmines & Zeller, 1979). Secondly, the construct reliability is assessed using a measure of internal consistency: the composite reliability (CR). Following the recommendations of Nunnally (1978), a value of 0.7 is used as a benchmark for a modest level of reliability that is applicable in the early stages of research, even though values greater than 0.8 are required for basic research. Thirdly, the measure of average variance extracted (AVE) is applied in order to assess the convergent validity of each construct. AVE measures the percentage of variance of a construct that is explained by its indicators, and these values should be greater than 0.50 (Fornell & Larcker, 1981). Since all the constructs (for all, non-profit-oriented, and profit-oriented samples) are valid with the previously defined criteria, our model is correctly specified from a theoretical point of view.

TABLE 3 HERE

Nevertheless, it is also necessary to assess the discriminant validity of the constructs. To this end, we use both the traditional Fornell-Larcker criterion and the Heterotrait-Monotrait ratio of correlations (HTMT) even though Henseler, Ringle & Sarstedt (2015) suggest that HTMT is theoretically superior to the Fornell-Larcker criterion since HTMT achieves high specificity and sensitivity rates across all

simulation conditions. Under the Fornell-Larcker framework, AVE should be greater than the variance shared between the construct and other constructs in the model. Roldán & Sánchez-Franco (2012) and Roldán et al. (2012) suggest that in order to obtain adequate discriminant validity, the diagonal elements should be significantly greater than the off-diagonal elements in the corresponding rows and columns. As shown in Table 4, this condition is satisfied for all the constructs of the resulting models except for CPPS in entire and profit-oriented samples, which does not invalidate the discriminant validity of this construct that is confirmed by HTMT. By using the HTMT criterion (Table 4.b), this ratio must be lower than 0.85 to obtain adequate discriminant validity (according to the most conservative criterion). However, an HTMT value lower than 0.90 could also be accepted, and an inference criterion for HTMT could even be made by using a bootstrapping procedure. As shown in Table 4, all the constructs (for all, non-profit-oriented, and profit-oriented samples) have a HTMT value lower than 0.85 which indicates the existence of discriminant validity for all the constructs.

TABLE 4 HERE

4.2. Structural model

The evaluation of the structural model is based on the sign, magnitude and significance of the structural path coefficients, and on the R^2 values (Roldán & Sánchez-Franco, 2012). Additionally, as recommended by Henseler, Dijkstra, Sarstedt, Ringle, Diamantopoulos, Straub, Ketchen, Hair, Hult & Calantone (2014), we also report the standardized root mean square residual (SRMR) as an approximate measure of overall model fit. In order to ascertain the statistical significance of the path coefficients, a bootstrapping procedure is performed with 5,000 resamples (Hair, Ringle & Arstedt, 2011), which allows standard errors and generates the *t*-statistics. However, a percentile bootstrap 95% confidence interval is also employed, which has the advantage of being completely distribution-free (Chin, 2010). Note that, following the recommendations of Williams & MacKinnon (2008), the significance of all mediating relations are only tested by using the percentile bootstrap 95% confidence interval, which considers that the indirect effect is significantly different from zero with 95% confidence when the interval for a mediation hypothesis does not contain zero.

20

Finally, to test whether the differences from multi-group analysis (Henseler & Fassott, 2010) in the hypothesized relationships are statistically significant, we employ the non-parametric permutation-based approach (Chin & Dibbern, 2010). This permutation procedure is the preferred approach used by the literature to perform a multi-group comparison of PLS models, since it is based on an approximate randomization test where a subset of all possible data permutations between groups is made and it does not rely on distributional assumptions (Felipe, Leidner, Roldan & Leal-Rodríguez, 2019).

Nevertheless, before comparing path estimates across groups, it is necessary to ensure the measurement invariance of composites, which is empirically tested by means of the measurement invariance of composite models (MICOM) procedure (Henseler, Ringle & Sarstedt, 2016). On establishing this invariance, we can ensure that the effect of the profit orientation of MFIs, as a moderating variable, is restricted to the path coefficients of the structural model and not to the parameters of the outer model.

In accordance with Henseler et al. (2016), MICOM is a three-step procedure, composed of: (i) configural invariance; (ii) compositional invariance; and (iii) an assessment of equal means and variances.

According to the results from Table 5, the full measurement invariance of both groups can be ensured. Only two of the three control variables (GDP per capita and size) do not follow this criterion, which is completely justified due to the characteristics of the control variables themselves to measure country and MFI features that affect all MFIs of the microfinance industry in the same way. Thus, the comparison between non-profit-oriented and profit-oriented MFIs can also be supported from a statistical view by using the permutation test (Chin & Dibbern, 2010), included in Table 7.

TABLE 5 HERE

4.2.1. Direct effect

As Figure 2.b and Table 6 show, we find that the direct effect of outreach (O) on financial performance (FP) is negative for the non-profit-oriented MFIs ($c_{np}' = -0.131$, p-value = 0.090). In

21

contrast, for the profit-oriented MFIs there is no significant direct relationship ($c_p' = 0.135$, p-value = 0.230).

These findings confirm, for non-profit-oriented MFIs, the existence of a trade-off between outreach and financial performance, and they support the theoretical arguments that suggest that MFIs can become financially self-sufficient if they move away from serving the people at the BoP. Consequently, based on these results, the mission drift of non-profit-oriented MFIs, which champions focusing on unbanked wealthier individuals, is justified, although this implies that the primary objective of the microfinance, to finance the poorest-of-the-poor, is being dangerously neglected. These results are supported by previous research such as Copestake (2007), Cull et al. (2007), Hudon (2010), Morduch (2000), and Hermes et al. (2011), although the mission drift is not evidenced by Gutiérrez-Nieto et al. (2009), Louis et al. (2013), Mersland & Strøm (2010), and Quayes (2012).

TABLE 6 HERE

FIGURE 2 HERE

4.2.2. Mediating effects

Despite the previous findings, in order to broaden the understanding on the impact of O on FP, we also analyse the mediating effects via commercial productivity (CPPS) and loan portfolio quality (PQ) -$\mathbf{H_2}$: a_1b_1; $\mathbf{H_3}$: a_2b_2; $\mathbf{H_4}$: $a_1a_3b_2$-, and place special emphasis on the moderating role of profit orientation of the MFIs. To this end, we follow the procedures and recommendations proposed by Chin (2010), Preacher & Hayes (2008), and Taylor et al. (2008).

On the one hand, by analysing the importance of mediators, as depicted in Figure 2a, the total explanatory power of O on the FP is, in terms of R-squared, 5.2%, 4.3%, and 16.7%, for all, non-profit-oriented, and profit-oriented samples, respectively. Nonetheless, when the mediators are introduced (Figure 2b), the explanatory power of FP increases substantially up to 16.6%, 22.4%, and 16.4% (for all, non-profit-oriented, and profit-oriented samples, respectively), which suggests that the commercial productivity (CPPS) and loan portfolio quality (PQ) are substantially important in the

explanation of the impact of O on FP. Indeed, for the full model (Figure 2b), the SRMR is of 0.070 (all), 0.061 (non-profit-oriented MFIs), and 0.073 (profit MFIs), lower than the stricter threshold of 0.080, which indicates an adequate overall model fit (Henseler et al., 2014). This means that both the CPPS and the PQ provide a powerful mediation in the relationship between O and FP of the MFIs.

On the other hand, by studying the sign and significance of the mediations (see Table 7 and Figure 2b), we find that the three mediating influences (via CPPS, PQ and both CPPS+PQ) of O on FP are all positive for non-profit-oriented MFIs, which balance the negative direct influence (suppression effect). Accordingly, the three indirect effects indicate that, for the non-profit MFIs, a greater outreach effectively improves the financial performance by increasing the commercial productivity and loan portfolio quality of the lending organisations. Therefore, commercial productivity and loan portfolio quality act like suppressor variables (Conger, 1974) causing that the overall impact of O on FP is positive (see Figure 2a). Hence, by considering the mediating effects, our findings do not support the mission drift for non-profit-oriented MFIs. However, there is one negative mediating effect (via PQ) of the three options for the profit-oriented MFIs. These results show the wide differences between the business models of non-profit-oriented and profit-oriented MFIs, and are next confirmed and more in-depth analysed by the results of the multi-group analysis.

4.2.3. Multi-group analysis

Table 7 shows the results of multi-group analysis. As can be observed, the mediations via CPPS (H$_2$) and via PQ (H$_3$) are significant in terms of permutation test, which highlight the importance of the moderating role of the profit orientation of the MFIs to explore the effects of the outreach on the financial performance. The findings from multi-group analysis can be analysed following the three mediations.

Firstly, the indirect impact of O on FP via CPPS is formed of two effects. The first effect is that of O on CPPS, which is significantly positive for both groups. Nevertheless, this influence is greater for profit-oriented MFIs due to their greater loan size, which increases their productivity (CPPS) to a greater extent. The second is the effect of CPPS on FP, which is not significant for both groups. Consequently, in consonance with H$_2$, our findings provide evidence of the existence of an indirect

effect of O on FP via CPPS. This indirect effect is positive for non-profit-oriented MFIs and negative for profit-oriented MFIs. This difference may show up that the high productivity of profit-oriented MFIs is due to the use of the same commercial practises than the traditional banking industry (advanced credit scoring and pricing models, among others), which do not result (as it was a priori expected) in greater financial performance. In other words, profit-oriented MFIs do not use (or use to a lesser extent) the typical microfinance lending practices –i.e., mainly lending-groups or relational banking-, which increase both productivity (due to the lower time spent since there is a deeper customer´s knowledge) and financial performance (due to confidence relationships with the customers favour the financial outcomes via reducing customer acquisition and monitoring costs, and increasing the fidelity of its clients).

Secondly, the results of the indirect effect of O on FP via PQ are particularly relevant not only due to the high value of the *p*-value but also due to the significant and opposite signs for both non-profit-oriented and profit-oriented lending organisations. These findings support $H_{3.1.a}$ and $H_{3.1.b}$ and confirm the different credit risk management existing in microfinance according to the profit orientation of the MFI. Moreover, these results enhance the model performed by the non-profit-oriented MFIs which is mainly based on: their focus on the BoP market, their proximity to the customers, their in-depth knowledge of social networks, and their use of social collateral and solidarity group-lending, which substantially improve (path = 0.332^{**}) the loan portfolio quality. Conversely, the path coefficient O-PQ for the profit-oriented MFIs is negative (-0.553^{**}), which suggests that a higher credit risk is carried by serving the upper strata of poverty (not BoP) and dismissing the peculiarities of the microfinance industry, such as not using solidarity group-lending, not focusing on rural areas and women, and not lending small size loans.

Therefore, since the paths between PQ and FP are positive and significant for both groups, the opposite signs in the path O-PQ implies that when the profit-oriented MFIs are achieving greater outreach, their portfolio quality is, at the same time, deteriorating (and consequently their FP is decreasing). In contrast, non-profit-oriented MFIs can serve the poorest customers (i.e., perform a greater outreach) while improving their loan portfolio quality (and thus increasing their FP). These results support H_3 and may be largely explained by the lending methodology (based on solidarity

group lending, which distributes the credit risk between all the borrowers and, therefore the group auto-manages the participation of the borrowers) and commercial strategy (based on close relationships with the customers to better understand the local networks and mechanisms) often used by the non-profit-oriented MFIs. Both aspects (solidarity group-lending and a close relationship with the customers) help to considerably reduce the information costs, adverse selection, and moral hazards, and to increase the use of social collateral, which in turn provokes a decrease of loss default, and thus an increment of the portfolio quality. Therefore, unlike what happens in the case of profit-oriented MFIs, the non-profit-oriented MFIs obtain a positive effect on their financial performance via portfolio quality (PQ) when they perform a higher outreach. These results highlight the idiosyncrasy of the microfinance industry and how the profit orientation of the lenders and their different levels of outreach have a large influence on PQ, which is the most important business area of MFIs (Rosenberg, 2009).

Thirdly, by considering the effect of O on FP via the sequential mediation CPPS-PQ, our results show that neither is there a difference of sign (a positive and significant mediating influence on FP for both profit-oriented and non-profit-oriented MFIs) nor are there significant differences between groups (permutation p-value = 0.242).

In summary, the results from the multi-group analysis therefore provide evidence of the existence of largely opposite and statistically significant differences in: (i) the direct effect of O on FP; and (ii) two of their three mediating influences. These differences are supported by both the postulations of the agency theory and the Hansmann´s theory of ownership and thus, confirm the existence of a duality of lending organisations in the microfinance industry, and brings to light that the management and ways of doing business of the non-profit-oriented and profit-oriented MFIs are (or should be) radically different.

TABLE 7 HERE

4.2.4. Limitations and future lines of research

The limitations of our results should be considered when generalizing our conclusions. Nonetheless, these limitations also provide avenues for future research. The first limitation is given by the use of a cross-sectional model: this is due to the PLS methodology. Nevertheless, longitudinal research may capture how, over time, the changes in the outreach influence the financial performance of the MFIs, which would improve the robustness of the findings. To check the robustness of our empirical results - which strengths the implications of our findings- we run the model by using data from another year (year 2016[2]). Thereby, we can compare the results and confirm whether the profit orientation of the MFIs really determines alternative business models and management styles in microfinance. Appendix 1 shows the results of the empirical analysis for the year 2016. As can be observed in Table A.1. and Table A.2. the previous relationships remain unaltered and, therefore, our findings can be generalized**.**

A second limitation is the wide variety of MFIs within the global sample used in our study. Future research may analyse the differences between geographic zones. A comparison study may detect how cultural and institutional environments affect both the outreach and financial results of MFIs.

5. Conclusion

The literature has yet to provide a full comprehension of the mechanisms and variables involved in the relationship between O and FP of MFIs. To this end, we perform an in-depth analysis of this relationship by exploring: (i) the mediating effects, via PQ and CPPS, of O on FP; and (ii) the moderating role that the profit orientation of MFIs exerts on the previous relationships.

Our results show that the relationship between O and FP is mediated by the CPPS and PQ of the MFIs, and moderated by the profit orientation of the MFIs, which originates large differences in both direct and indirect effects between profit-oriented and non-profit-oriented MFIs. To the best of our knowledge, this is the first study in the microfinance literature that, by applying a multi-group PLS analysis, demonstrates the indirect mediation that both commercial productivity and portfolio quality perform on the relationship between O and FP of MFIs.

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[2] Last year currently available.

Essentially, our main finding is that the direct and mediating (via CPPS and PQ) effects of O on FP are the opposite to those for non-profit-oriented MFIs. The negative direct influence of O on FP, at first glance, justifies the mission drift of the non-profit-oriented MFIs and supports the commercialization of microfinance, which implies serving people situated in the upper strata of the poverty pyramid, but not those at the bottom of the socio-economic pyramid for whom the primary mission of microfinance was created. Nevertheless, this direct effect is suppressed by three positive mediating relationships via CPPS, PQ, and CPPS-PQ. Our results show that the mediations are strong enough to change the sign (from negative to positive) of the overall effect of O on FP, suggesting that, in contrast to that which occurs in the traditional banking industry, the act of serving people at the BoP stratum (as non-profit-oriented MFIs do) carries lower default risk (i.e., higher PQ) and higher productivity (i.e., higher CPPS), and consequently greater financial performance.

Not surprisingly, the direct and indirect (both via CPPS and PQ) relationships present significantly opposite signs for profit-oriented MFIs, thereby confirming the theoretically-argued duality (social or non-profit-oriented versus commercial or profit-oriented) of MFIs in the microfinance, which therefore require specific management-business practices and strategies to attain their goals. These results are indeed supported by both Hansmann´s theory of ownership and by the agency theory, which argue substantial differences in performance and management among non-profit-oriented and profit-oriented work organisations.

In closing, it remains to be mentioned that relevant implications for both researchers and practitioners arise from our findings. On the one hand, academics should take into account the mediating relationships, at least those via loan portfolio quality and productivity, when analysing the effect of O on FP, since, according to our results, these indirect influences are even more important than those on a direct path. Additionally, researchers must also consider the duality among non-profit-oriented and profit-oriented MFIs and, consequently, they must perform their analysis separately for each type of MFI. Furthermore, this study provides microfinance managers and policy makers with empirical support in making alternative decisions separately and specifically for non-profit-oriented and profit-oriented MFIs. More specifically, since the negative direct effect of outreach on financial performance cannot be distorted, our results encourage non-profit-oriented MFIs to maintain the

establishment of close relationships (by means of knowledge of social networks, personnel assistance, business tutoring, and continuous monitoring) with their customers, since this enables them to maximize both their portfolio quality and commercial productivity and, therefore also to increase their financial performance. This management strategy is in contradiction with that of traditional commercial banks and profit-oriented MFIs, which promote online customer relationship systems and applicant evaluations based on automatic credit risk (such as credit scoring), thereby highlighting again the particular idiosyncrasies of the microfinance industry.

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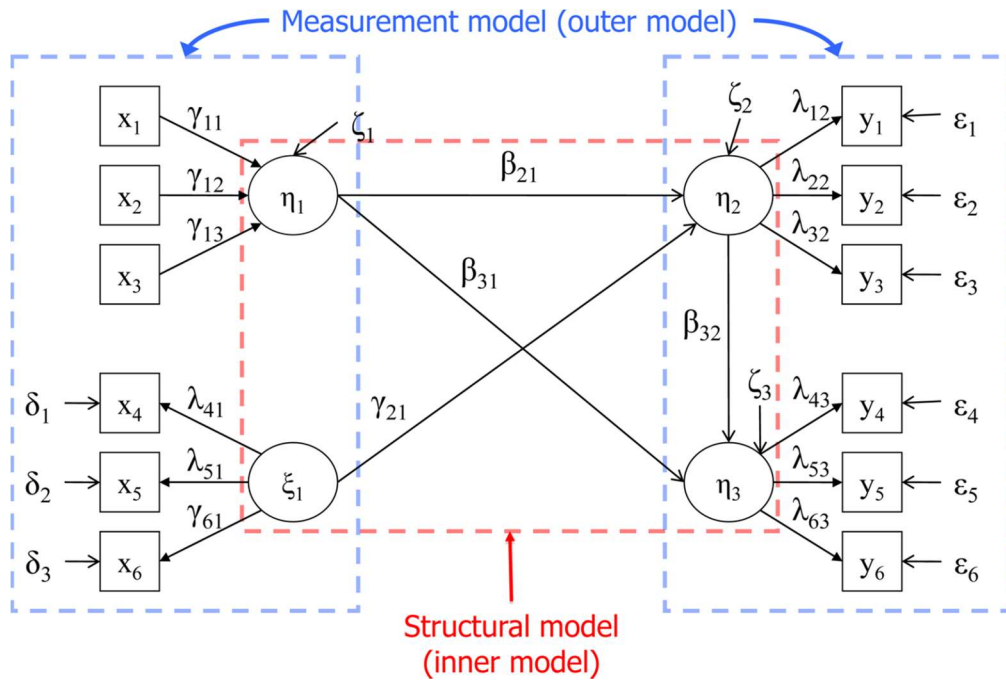
Figure 1. Graphic example of PLS (Roldán & Sánchez-Franco, 2012)

A. Model with total effect

Outreach (O)

$\mathbf{c_e = 0.052^*}$
$c_{np} = 0.043^*$
$c_p = 0.167^*$

Financial Performance (FP)
$\mathbf{R^2_e = 8.1\%}$
$R^2_{np} = 7.8\%$
$R^2_p = 11.3\%$

B. Model with a three-path mediated effect

Commercial Productivity Provision Service (CPPS)
$\mathbf{R^2_e = 50.7\%}$
$R^2_{np} = 38.4\%$
$R^2_n = 61.2\%$

$\mathbf{a_{3e} = 0.139}$
$a_{3np} = 0.065$
$a_{3p} = 0.475^*$

Loan Portfolio Quality (PQ)
$\mathbf{R^2_e = 4.1\%}$
$R^2_{np} = 13.2\%$
$R^2_p = 17.1\%$

(bold) e = entire sample
(normal) np = non-profit-oriented
(italics) p = profit-oriented

$\mathbf{a_{1e} = 0.795^{***}}$
$a_{1np} = 0.668^{***}$
$a_{1p} = 0.876^{***}$

$\mathbf{a_{2e} = -0.117}$
$a_{2np} = 0.332^{**}$
$a_{2p} = -0.553^{**}$

$\mathbf{b_{1e} = -0.154^*}$
$b_{1np} = 0.226^*$
$b_{1p} = -0.110$

$\mathbf{b_{2e} = 0.289^{**}}$
$b_{2np} = 0.249^*$
$b_{2p} = 0.375^*$

Outreach (O)

$\mathbf{c'_e = -0.077}$
$c'_{np} = -0.131$
$c'_p = 0.135$

Financial Performance (FP)
$\mathbf{R^2_e = 16.6\%}$
$R^2_{np} = 22.4\%$
$R^2_p = 16.4\%$

SRMR composite factor model e = 0.070
SRMR composite factor model np = 0.061
SRMR composite factor model p = 0.073

$\mathbf{H_1}$ = Outreach → Financial performance = c′
$\mathbf{H_2}$ = Outreach → Commercial productivity provision service → Financial performance = $a_1 b_1$
$\mathbf{H_3}$ = Outreach → Loan portfolio quality → Financial performance = $a_2 b_2$
$\mathbf{H_4}$ = Outreach → Commercial productivity provision service → Loan portfolio quality → Financial performance = $a_1 a_3 b_2$

*p<0.05; **p<0.01; ***p<0.001.

Figure 2. Structural model. (A) Model with total effect and (B) Model with a three-path mediated effect.

Table 1. Description of the dataset per profit orientation[*].

	Non-Profit-oriented MFIs (n = 209)	Profit-oriented MFIs (n = 226)
Legal status[***]	Bank 1.90%	Bank 21.50%
	NGO 67.60%	NGO 1.10%
	NBFI 10.50%	NBFI 71%
	Credit Union 19%	Credit Union 0.50%
	Rural Bank 0%	Rural Bank 2.70%
	Other 1%	Other 3.20%
Depth of outreach	Low end 44.80%	Low end 40.30%
	Breadth 52.20%	Breadth 47%
	High end 2%	High end 7.20%
	Small business 1%	Small business 5.50%
Breadth of outreach	Large 31.30%	Large 55.60%
	Medium 25.40%	Medium 19.10%
	Small 43.30%	Small 25.30%
Regulation	Yes 45.20%	Yes 79.30%
	No 54.80%	No 20.70%
FSS[**]	Yes 83.10%	Yes 84.40%
	No 16.90%	No 15.60%
Region	Africa 5.20%	Africa 5.40%
	East Asia & the Pacific 3.30%	East Asia & the Pacific 9.70%
	Eastern Europe & Central Asia 9.50%	Eastern Europe & Central Asia 20.40%
	Latin America & The Caribbean 61%	Latin America & The Caribbean 39.20%
	Middle East & North Africa 5.70%	Middle East & North Africa 1.10%
	South Asia 15.20%	South Asia 24.20%

[*] Due to missing values, the percentages sometimes fail to reach a total of 100%.
[**] NBFI = Non-banking financial institution. FSS = Financial Self-sufficiency.
[***] Banks and credit unions are considered commercial MFIs, whilst the remaining MFIs are classified as social MFIs.

Table 2. Descriptive statistics of the measures.

Indicators	Non-Profit-oriented MFIs (n = 209)					Profit-oriented MFIs (n = 226)				
	Mean	Std. dev.	Q1	Q2	Q3	Mean	Std. dev.	Q1	Q2	Q3
Percentage of women borrowers	0.646	0.229	0.455	0.602	0.866	0.668	0.263	0.449	0.636	0.946
Average loan balance per borrower, adjusted by GNI per capita (inverse)	0.002	0.002	0.0005	0.001	0.003	0.002	0.002	0.0005	0.001	0.004
Number of active borrowers	54,707.9	118,862.2	4,489.5	12,486	45,825.5	105,211.2	157,769.4	9,825.3	39,127	137,483.8
Percentage of gross loan portfolio in rural areas	0.568	0.299	0.335	0.570	0.822	0.576	0.275	0.416	0.584	0.776
Percentage of gross loan portfolio lent under solidarity group-lending	0.345	0.405	0.000	0.096	0.812	0.322	0.420	0.000	0.005	0.760
Return on assets	0.091	0.052	0.012	0.011	0.012	0.098	0.048	0.010	0.011	0.013
Operational sustainability	0.791	0.406	1.000	1.000	1.000	0.844	0.363	1.000	1.000	1.000
Profit margin	0.100	0.289	0.021	0.129	0.225	0.115	0.230	0.054	0.137	0.228
Portfolio non-overdue > 30 days	0.955	0.042	0.944	0.965	0.986	0.961	0.046	0.945	0.976	0.992
Gross loan portfolio divided by the loans written off	0.983	0.028	0.979	0.991	0.998	0.973	0.046	0.971	0.991	0.998
Loans outstanding per staff member	148.15	134.08	88	120	158	140.59	106.79	57	108	186
Costs per loan outstanding (Inverse)	0.013	0.018	0.004	0.006	0.010	0.016	0.022	0.003	0.006	0.016
Loans per loan officer	331.23	190.41	217	279.50	390.75	317.58	272.36	148	246.50	362.25
Gross Domestic Product (GDP) growth (annual %)	3.112	5.047	0.610	3.702	5.184	2.704	6.186	0.237	3.411	5.826
Assets ($MM)	55.416	157.234	2.500	7.800	40.000	202.673	449.550	11.000	35.000	160.000
Loan interest rate (real)	0.245	0.134	0.143	0.215	0.354	0.275	0.195	0.137	0.226	0.342

Table 3. Measurement model results.

Item description	Non-profit-oriented MFIs (n = 209)				Profit-oriented MFIs (n = 226)				Total Sample (n = 435)			
	Loading	Weight	Composite reliability (CR)	Average variance extracted (AVE)	Loading	Weight	Composite reliability (CR)	Average variance extracted (AVE)	Loading	Weight	Composite reliability (CR)	Average variance extracted (AVE)
Outreach (O) (mode B-formative construct)			**n. a.**	**n. a.**			**n. a.**	**n. a.**			**n. a.**	**n. a.**
o1: Percentage of women borrowers	0.937	0.652			0.745	0.327			0.785	0.361		
o2: Average loan balance per borrower, adjusted per GNI per capita (inverse)	0.584	0.203			0.643	0.343			0.593	0.326		
o3: Number of active borrowers	0.418	0.177			0.726	0.479			0.662	0.447		
o4: Percentage of gross loan portfolio in rural areas	0.298	0.233			0.405	0.055			0.382	0.151		
o5: Percentage of gross loan portfolio lent under solidarity group-lending	0.759	0.168			0.786	0.210			0.751	0.226		
Financial performance (FP) (mode A-reflective construct)			**0.936**	**0.830**			**0.937**	**0.831**			**0.932**	**0.822**
fp1: Return on assets	0.930	0.316			0.934	0.335			0.911	0.285		
fp2: Operational sustainability (dummy variable)	0.854	0.343			0.848	0.355			0.862	0.376		
fp3: Profit margin	0.947	0.436			0.950	0.406			0.944	0.441		
Loan portfolio quality (PQ) (mode A-reflective construct)			**0.776**	**0.635**			**0.791**	**0.656**			**0.779**	**0.640**
pq1: Portfolio non-overdue > 30 days	0.851	0.701			0.855	0.682			0.872	0.724		
pq2: Gross loan portfolio divided by the loans written off	0.739	0.547			0.762	0.547			0.721	0.511		

	1	2	3	4	5	6	7	8	9	10	11	12
Commercial productivity in the provision of the service (CPPS) (mode A-reflective construct)			**0.754**	**0.548**			**0.893**	**0.735**			**0.824**	**0.616**
cpps1: Loans outstanding per staff member	0.887	0.562			0.916	0.455			0.904	0.543		
cpps2: Costs per loan outstanding (inverse)	0.882	0.562			0.808	0.370			0.817	0.466		
cpps3: Loans per loan officer	0.637	0.020			0.844	0.337			0.602	0.214		

Table 4. Discriminant validity assessment.

a. Fornell-Larcker criterion.

	O	FP	PQ	CPPS
O	**n. a.** n. a. *n. a.*			
FP	**0.080** 0.080 *0.034*	**0.906** 0.911 *0.912*		
PQ	**-0.006** 0.375 *-0.137*	**0.324** 0.290 *0.396*	**0.800** 0.797 *0.810*	
CPPS	**0.795** 0.668 *0.876*	**0.154** 0.248 *0.055*	**0.046** 0.287 *-0.010*	**0.785** 0.739 *0.857*

O: Outreach; FP: Financial performance; PQ: Loan portfolio quality; CPPS: Commercial productivity in the provision of the service. The diagonal elements (underlined) are the square root of the AVEs; off-diagonal elements are the correlations among constructs. n. a.: Non-applicable
(bold) e = entire sample
(normal) np = non-profit-oriented MFIs
(italics) p = profit-oriented MFIs

b. Heterotrait-Monotrait -HTMT- ratio criterion.

	O	FP	PQ	CPPS
O				
FP				
PQ	**n. a.** n. a. *n. a.*	**0.479** 0.444 *0.576*		
CPPS	**n. a.** n. a. *n. a.*	**0.175** 0.303 *0.105*	**0.314** 0.504 *0.282*	**n. a.** n. a. *n. a.*

O: Outreach; FP: Financial performance; PQ: Loan portfolio quality; CPPS: Commercial productivity in the provision of the service. n. a.: Non-applicable
(bold) e = entire sample
(normal) np = non-profit-oriented MFIs
(italics) p = profit-oriented MFIs

Table 5. Results of the measurement invariance of composite models (MICOM) procedure.

Construct	Step 1 (configural invariance)	Step 2 (compositional invariance)			Step 3a (equal means)				Step 3b (equal variances)				Full measurement invariance established
		Original correlation	2.5%	Partial measurement invariance established	Mean - Original difference (non-profit minus profit)	2.5%	97.5%	Equal	Variance - Original difference (non-profit minus profit)	2.5%	97.5%	Equal	
O	Yes	0.918	0.737	Yes	0.037	-0.329	0.406	Yes	-0.693	-0.702	0.698	Yes	Yes
FP	Yes	1.000	0.986	Yes	-0.122	-0.342	0.352	Yes	0.562	-0.803	0.816	Yes	Yes
CPPS	Yes	0.945	0.940	Yes	-0.109	-0.341	0.337	Yes	-0.710	-0.720	0.706	Yes	Yes
PQ	Yes	1.000	-0.978	Yes	-0.014	-0.321	0.339	Yes	-1.216	-1.417	1.374	Yes	Yes
Control variables:													
GDP per capita	Yes	1.000	1.000	Yes	-0.376	-0.242	0.317	No	0.177	-0.475	0.379	Yes	No
Size	Yes	1.000	1.000	Yes	-0.654	-0.296	0.244	No	-0.209	-0.384	0.307	Yes	No
Loan interest rate	Yes	1.000	1.000	Yes	0.270	-0.255	0.362	Yes	-0.176	-0.655	0.716	Yes	Yes

Table 6. Effects on endogenous variables.

Effects on endogenous variables	Theoretical sense (support)	Direct effect (path coefficient)	p-value	t-value (bootstrap)	Percentile 95% confidence intervals
CPPS ($R^2 = 0.507$) ($R^2 = 0.384$) (*$R^2 = 0.612$*)					
O (a_1)	+ (Yes) + (Yes) *+ (Yes)*	**0.795** 0.668 *0.876*	**0.000** 0.000 *0.000*	**25.790*** Sig.** 11.802*** Sig. *31.620*** Sig.*	**[0.738;0.840] Sig.** [0.561;0.748] Sig. *[0.824;0.911] Sig.*
PQ ($R^2 = 0.041$) ($R^2 = 0.132$) (*$R^2 = 0.171$*)					
O (a_2)	+/- (Yes) + (Yes) *- (Yes)*	**-0.117** 0.332 *-0.553*	**0.284** 0.009 *0.007*	**0.570 Nsig.** 2.359** Sig. *1.467** Sig.*	**[-0.672;-0.016] Sig.** [0.042;0.518] Sig. *[-1.247;-0.060] Sig.*
CPPS (a_3)	+ (Yes) + (Yes) *+ (Yes)*	**0.139** 0.065 *0.475*	**0.180** 0.203 *0.048*	**1.095 Nsig.** 0.832 Nsig. *1.662* Sig.*	**[0.012;0.415] Sig.** [0.003;0.193] Sig. *[0.063;0.986] Sig.*
FP ($R^2 = 0.166$) ($R^2 = 0.224$) (*$R^2 = 0.164$*)					
O (c')	+/- (Yes) +/- (Yes) *+/- (Yes)*	**-0.077** -0.131 *0.135*	**0.263** 0.090 *0.230*	**0.635 Nsig.** 1.340 NSig. *0.739 Nsig.*	**[-0.266;-0.010] Sig.** [-0.304;-0.009] Sig. *[0.006;0.437] Sig.*
CPPS (b_1)	+ (Yes) + (Yes) *+ (No)*	**0.154** 0.226 *-0.110*	**0.050** 0.020 *0.210*	**1.984* Sig.** 2.047* Sig. *0.808 Nsig.*	**[0.018;0.308] Sig.** [0.039;0.394] Sig. *[-0.331;-0.004] Sig.*
PQ (b_2)	+ (Yes) + (Yes) *+ (Yes)*	**0.289** 0.249 *0.375*	**0.006** 0.026 *0.025*	**2.495** Sig.** 1.943* Sig. *1.966* Sig.*	**[0.101;0.483] Sig.** [0.032;0.450] Sig. *[0.032;0.643] Sig.*
Control variables					
Size (assets)		**0.268** 0.708 *0.651*	**0.000** 0.017 *0.034*	**4.210*** Sig.** 2.755* Sig. *2.408* Sig.*	**[0.210;0.475] Sig.** [0.014;0.277] Sig. *[0.009;0.247] Sig.*
GDP growth		**0.042** 0.337 *0.554*	**0.485** 0.216 *0.433*	**0.772 Nsig.** 0.943 Nsig. *0.801 Nsig.*	**[0.003;0.142] Sig.** [0.105;0.340] Sig. *[0.011;0.340] Sig.*
Loan interest rate		**0.187** 0.343 *0.604*	**0.038** 0.204 *0.147*	**2.241* Sig.** 1.360 Nsig. *1.502 Nsig.*	**[0.018;0.247] Sig.** [0.021;0.523] Sig. *[0.120;0.351] Sig.*

O: Outreach; FP: Financial performance; PQ: Loan portfolio quality; CPPS: Commercial productivity in the provision service. *p < 0.05; **p < 0.01; ***p < 0.001 (based on t (4999), one-tailed test); t (0.05; 4999) = 1.964726835; t (0.01; 4999) = 2.585711627; t (0.001; 4999) = 3.310124157. Sig. denotes a significant direct effect at 0.05; Nsig. denotes a non-significant direct effect at 0.05.
(bold) e = entire sample
(normal) np = non-profit-oriented MFIs
(italics) p = profit-oriented MFIs

Table 7. Multi-group analysis based on PLS-MGA and permutation tests.

	Path coefficients						Differences in path coefficients ($\lvert$Path$_{non\text{-}profit}$ - Path$_{profit}\rvert$)	Permutation *p*-value	Follows expectation
	Non-Profit-oriented			**Profit-oriented**					
Direct effect:	**Point estimate**	***p*-value**	**Expected sign (supported)**	**Point estimate**	***p*-value**	**Expected sign (supported)**			
O → FP (H_1)	-0.131	0.090	- (Yes)	0.135	0.230	- (No)	0.266*	0.043	Yes
O → CPPS ($H_{2.1}$)	0.668***	0.000	+ (Yes)	0.876***	0.000	+ (Yes)	0.208***	0.000	Yes
CPPS → FP ($H_{2.2}$)	0.226	0.020	+ (Yes)	-0.110	0.210	+ (No)	0.336**	0.009	Yes
O → PQ ($H_{3.1}$)	0.332**	0.009	+ (Yes)	-0.553**	0.007	- (Yes)	0.885***	0.000	Yes
PQ → FP ($H_{3.2}$)	0.249*	0.026	+ (Yes)	0.375*	0.025	+ (Yes)	0.126	0.706	Yes
CPPS → PQ ($H_{4.1}$)	0.065	0.203	+ (Yes)	0.475*	0.048	+ (Yes)	0.410*	0.048	Yes
Indirect effects:									
	Point estimate	**Percentile confidence interval**	**Expected sign (supported)**	**Point estimate**	**Percentile confidence interval**	**Expected sign (supported)**			
O → CPPS → FP ($H_2 = H_{2.1} + H_{2.1}$)	0.151	[0.122;0.387] Sig.	+ (Yes)	-0.096	[-0.557;-0.018] Sig.	+ (No)	0.247*	0.023	Yes
O → PQ → FP ($H_3 = H_{3.1} + H_{3.2}$)	0.083	[0.012;0.187] Sig.	+ (Yes)	-0.207	[-0.578;-0.024] Sig.	- (Yes)	0.290*	0.044	Yes
O → CPPS → PQ → FP ($H_4 = H_{2.1} + H_{4.1} + H_{3.2}$)	0.011	[0.006;0.068] Sig.	+ (Yes)	0.156	[0.004;0.381] Sig.	+ (Yes)	0.145	0.242	No

*p < 0.05; **p < 0.01; ***p < 0.001

Appendix

Table A.1. Results of the measurement invariance of composite models (MICOM) procedure (year 2016).

Construct	Step 1 (configural invariance)	Step 2 (compositional invariance)			Step 3a (equal means)				Step 3b (equal variances)				Full measurement invariance established
		Original correlation	2.5%	Partial measurement invariance established	Mean - Original difference (non-profit minus profit)	2.5%	97.5%	Equal	Variance - Original difference (non-profit minus profit)	2.5%	97.5%	Equal	
O	Yes	0.299	-0.184	Yes	0.463	-0.675	0.705	Yes	-0.447	-1.193	1.279	Yes	Yes
FP	Yes	0.994	0.919	Yes	-0.668	0.652	0.262	Yes	1.080	-1.249	1.613	Yes	Yes
CPPS	Yes	0.999	0.985	Yes	0.470	-0.720	0.684	Yes	0.090	-0.837	0.839	Yes	Yes
PQ	Yes	0.982	-0.943	Yes	0.383	-0.657	0.686	Yes	0.895	-2.301	2.518	Yes	Yes
Control variables:													
GDP per capita	Yes	1.000	1.000	Yes	-0.429	-0.300	0.289	No	0.159	-0.549	0.544	Yes	No
Size	Yes	1.000	1.000	Yes	-0.724	-0.285	0.279	No	-0.163	-0.342	0.342	Yes	No
Loan interest rate	Yes	1.000	1.000	Yes	0.204	-0.290	0.294	Yes	-0.216	-0.683	0.682	Yes	Yes

Table A.2. Multi-group analysis based on PLS-MGA and permutation tests (year 2016).

	Path coefficients						Differences in path coefficients ($\mid$ Path$_{non\text{-}profit}$ - Path$_{profit}$ $\mid$)	Permutation p-value	Follows expectation
	Non-Profit-oriented			Profit-oriented					
Direct effect:	Point estimate	*p*-value	Expected sign (supported)	Point estimate	*p*-value	Expected sign (supported)			
O → FP (H_1)	0.037	0.329	- (No)	-0.014	0.443	- (Yes)	0.051	0.395	Yes
O → CPPS ($H_{2.1}$)	0.453***	0.000	+ (Yes)	0.510***	0.000	+ (Yes)	0.057	0.322	Yes
CPPS → FP ($H_{2.2}$)	0.214*	0.017	+ (Yes)	0.285**	0.005	+ (Yes)	0.071	0.313	Yes
O → PQ ($H_{3.1}$)	0.153*	0.043	+ (Yes)	-0.287*	0.014	- (Yes)	0.440**	0.015	Yes
PQ → FP ($H_{3.2}$)	0.116*	0.015	+ (Yes)	0.202*	0.034	+ (Yes)	0.086**	0.001	Yes
CPPS → PQ ($H_{4.1}$)	0.214*	0.017	+ (Yes)	0.285**	0.005	+ (Yes)	0.207	0.090	Yes
Indirect effects:									
	Point estimate	Percentile confidence interval	Expected sign (supported)	Point estimate	Percentile confidence interval	Expected sign (supported)			
O → CPPS → FP ($H_2 = H_{2.1} + H_{2.1}$)	0.097	[0.024;0.102] Sig.	+ (Yes)	0.145	[0.131;0.573] Sig.	+ (No)	0.048	0.064	No
O → PQ → FP ($H_3 = H_{3.1} + H_{3.2}$)	0.018	[0.008;0.057] Sig.	+ (Yes)	-0.058	[-0.067;-0.126] Sig.	- (Yes)	0.040*	0.021	Yes
O → CPPS → PQ → FP ($H_4 = H_{2.1} + H_{4.1} + H_{3.2}$)	0.011	[0.140;0.611] Sig.	+ (Yes)	0.029	[0.017;0.420] Sig.	+ (Yes)	0.018	0.164	No

*p < 0.05; **p < 0.01; ***p < 0.001