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FINANCIAL AND SOCIAL PERFORMANCE OF ISLAMIC MICROFINANCE INSTITUTIONS: A PANEL STUDY

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1. INTRODUCTION

Microfinance disseminates financial services to the poor through a set of varied microfinance institutions (MFIs). Some MFIs have experienced bankruptcy or failed to achieve financial sustainability, surviving thanks to the subsidies from various national and international donors. Other MFIs have favoured financial performance to the detriment of their social mission. MFIs targeting poor clients located in rural areas face significant transaction costs, a lack of collateral and possibly a substantial default risk, which drive them to charge high interest rates upon borrowers to achieve financial self-sufficiency.

MFIs are facing a double challenge: they must ensure the inclusion of poor people, while being financially sustainable without depending on subsidies. The complementarity between social and financial performance is far from satisfied and achieving this complementarity is a major issue for the microfinance industry. With regard to the importance of the Muslim population, 650 million of which live below the $ 2 a day poverty threshold (Obaidullah and Khan, 2008), 255 Islamic MFIs (hereafter IMFIs) operate worldwide, mainly in two regions: 164 in East Asia and Pacific (EAP) and 72 in Middle East and North Africa (MENA), wherein the microfinance industry is growing fast (El-Zoghbi and Tarazi, 2013).

These IMFIs follow a different strategy from conventional MFIs (here after CMFIs) to achieve the same objective of poverty alleviation: they offer poor Muslim clients Sharia compliant financial services that do not charge interest rates (Ribaa) and are based on the principle of risk sharing. As compared with conventional MFIs, are Islamic MFIs able to target the poor, while being financially successful?

Section one compares the conventional and Islamic MFIs in terms of funding sources, financial services, default risk and the target clientele. Section two overviews the empirical literature on financial performance (FP) and social performance (SP) of IMFIs and their determinants. Section three presents the sample and data, assumptions and variables as well as and the methodology addressing the relationship between performance on an unbalanced panel of 67 MFIs, including 18 IMFIs in 10 countries in the MENA region over 2008-2019; it distinguishes IMFIs that exclusively offer Islamic services (Sole business) from CMFIs offering Islamic services (Window) alongside with conventional services. Section four presents the estimation results of two econometric models with interaction variables, according to which there is a difference in performance and determinants between Window and Sole business IMFIs, although there is no such difference between CMFIs and IMFIs.

1.1 Conventional versus Islamic MFIs

Islamic MFIs differ from conventional MFIs with respect to funding resources, financial services, default risk management and the targeted clientele.

1.2 Funding resources

Funding resources for CMFIs mainly come from foreign donors, government and the Central Bank; they vary according to their stage of development. At their start, they receive large subsidies. As they grow, they receive refunds to customers and financing at subsidized rates from donors while trying to reach the break-even point. Once they become mature and profitable, they can access commercial funding sources (savings, refunding from the Central Bank, interbank lending, securities issuance, etc.).According to a survey of 36 IMFI from Arab countries by 2010, NGOs account for about half of the donors, Non-Banking Financial Institutions (NBFIs) about a quarter and commercial banks over one sixth (Sanabel, 2012).

IMFIs offer Sharia-compliant financial services without interest, which are considered

fair and less risky for borrowers compared to conventional microfinance services. According to El- Komi and Croson (2013), Islamic contracts give the borrower more participatory power, more vigilance and motivation to repay its debts on time especially when the project generates profits. The IMFIs can benefit from three categories of operations: Murabahah, Ijara and direct funding from Mucharakah and Mudarabahcontracts (Ismail and Poussumah, 2012). Partnership contracts and profit and loss sharing (Mudharabah and Mucharakah) would be best suited to microfinance (El-Zoghbi and Tarazi, 2013). However, what may be suitable does not fit the facts:in regard of total assets for Islamic financial products in 2010, the share ofMudharabah and Mucharakah is only a little over six per cent, whereas that of Murabahah accounts for two thirds and Qard Hassan for one quarter (Zulkhibri, 2016). In addition, Murabahah is most used among Islamic financial services (35 IMFIs), ahead of unpaid deposits (11 IMFIs), Qard Hassan and Mucharakah (7 IMFIs) and Mudharabah (6 IMFIs); other Islamic services are used by very few IMFIs (Sanabel, 2012).

1.3 Default risk management

CMFIs include a principle of joint responsibility of borrowers in the loan agreement to solve problems related to the presence of information asymmetries and / or reduce the costs incurred to ensure compliance with the loan agreement. This group loan methodology compensates for the lack of collateral, avoiding both adverse selection and moral hazard. IMFIs rely on the same principle of solidarity: Islamic brotherhood added to the religious duty to honor the debts must be able to strengthen ties within the group of borrowers, ensuring payment deadlines. Moreover, Islamic services should help IMFIs better manage the default risk. In the Murabahah contract, the IMFI directly provides an asset to the customer and the risk of diversion or misuse is reduced. Compared to conventional microfinance contracts, loss and profit sharing contracts Moudharabah and Mucharakah induce significantly higher repayment rates (El-Komi and Croson, 2013)

1.4. The targeted clientele

CMFIs target women because they are poorer than men and have a growing need for resources to improve the situation of their families. Conventional microfinance is also a tool for these women to promoting their capacity for empowerment and reducing inequalities. IMFIs target poor families (Ahmed, 2002). The woman and her husband are jointly liable for the contract they signed, although only women participate in weekly meetings and social development programs in as much as they are more available.

1.5. Performance

In conventional microfinance, the relationship between social performance and financial performance refers to the two opposite approaches of welfare institutional vs. institutional institutions. The first approach emphasizes social performance without rejecting financial performance on the long run. The second approach considers that the prior adoption of financial performance is the best way to achieve social performance on the long run. Thus, these approaches fall under a short- run trade-off and a long-term complementarity between the two performances (Adair and Berguiga, 2014), whereby most empirical studies point out that they are in tension.

As part of an IMFI, moral values, targeting families, the nature of services and the religious motivations of staff can serve the poor, thus achieving social performance. Table 1 below compares conventional to Islamic microfinance with respect to funding, services, risk management and performance.

Table 1. A comparison of CMFIs with IMFIs

Type of MFI	Conventional	Islamics
Objective	**Poverty alleviation**	
Funding resources	Subsidies, repayment from customers and private resources	
	Donors	Islamic Funds
Financial services	Credit with interest charged	Interest-free contracts
Risk management	**Loan repayment solidarity**	
	Joint liability	Profit and Loss Sharing (PLS) Transfer of property
Targeted clientele	Poor / non-poor women	Poor Muslim families
Performance	**SP – FP tradeoff**	
	FP at the expense of SP	SP to the detriment of FP

Source: Berguiga, Said and Adair (2017).

2. LITERATURE REVIEW

In the literature on Islamic microfinance, most papers are descriptive and deal with small samples or a short period of time. Some focus on the determinants of financial performance (Ibrahim et al, 2016; Mahmood et al, 2014; Kamaluddin and Kasim, 2013), or social performance (Rahman, 2010). Others explore the relationship between the social and financial performance of IMFIs and their determinants, coming up with diverging conclusions (Ahmed, 2002; Widiarto and Emrouznejad, 2015; Ben Abdelkader and Ben Salem, 2013; Farooq and Khan, 2014; Fersi and Boujelbéne, 2016).

Ahmed (2002) compares three IMFIs from Bangladesh, together with the Grameen Bank CMFI, analysing financial ratios over the period August 1999-November 1999. He shows that IMFIs are more efficient and sustainable; the staff productivity is higher and the default rate is lower. Results are explained by the values of Islam: the IMFI benefits from Islamic funds; staff has religious motives; the granting of group loans is more efficient and Muslims are more reliable borrowers. IMFIs hold significant potential resources (Zakah, Sadaqah and Waqf) and untapped Islamic financial instruments, whereas the transfer of property and assets would be the best way to fight against the misuse of loans.

Rahman (2010) evaluates the role of moral and ethical changes in behavior among clients, analyzing their impact on poverty reduction following the investments of the Rural Development Scheme programme launched by the Islamic Bank of Bangladesh (IBBL) in 1995. Data on 1,020 customers were collected from December 2006 to April 2007 with a national questionnaire. The results of an OLS regression and logit models show that household income, the productivity of crops and livestock, expenditure and employment increased significantly following these behavioral changes and the availability of microfinance.

Ben Abdelkader and Ben Salem (2013) use a non-parametric approach (DEA) to compare the performance of 14 IMFI sand 51 CMFIs from the MENA region over the period 2005-2010. According to results, there is no significant difference in financial and social performance between IMFIs and CMFIs. Sharia-compliant services do not affect the efficiency of MFIs. Kamaluddin and Kasim (2013) analyse the direct and indirect relationship between human resource management and performance of IMFIs in Malaysia, whose data are collected with a questionnaire. Direct regressions show that improved performance is associated with better human resource management and quality of human capital. However, the indirect relationship is insignificant: human capital is not a mediator between the human resource management and performance of MFIs; other organizational capital should be considered to explain this relationship.

Mahmood et al. (2014) compare the effectiveness of nine CMFIs and three IMFIs in Pakistan over the period 2008-2011, using DEA technical efficiency scores for poor clients and change in efficiency scores over the period (Malmquist index). The results show that two

out of three IMFIs and two out of nine CMFIs stand on the efficiency frontier. IMFIs outperform CMFIs, albeit no significant growth in production factors was recorded over the period.

Farooq and Khan (2014) assess the social and financial performance of two IMFIs and two CMFIs in Pakistan, which are ranked four stars by the MIX database, over the period 2005- 2012. They use five categories of social and financial performance indicators: efficiency and productivity; the portfolio quality; the financial structure; profitability; social performance (outreach). CMFIs are more financially efficient than IMFIs and both groups of MFIs are very close in terms of social performance, although CMFIs target more women.

Widiarto and Emrouznejad (2015) compare social and financial efficiency of CMFIs and IMFIs on a sample of 231 MFIs in three regions: East Asia and the Pacific (EAP), South Asia (SA) and MENAover the period 2009-2010. The results of output-oriented DEA show that CMFIs are more mature as well as financially and socially more efficient than IMFIs (EAP and SA). However, input-oriented DEA shows that performance of IMFIs is close to that of CMFIs at the global level, at the level of both social and financial efficiency across all regions and in the MENA region.

Ibrahim et al. (2016) analyse the determinants of profitability of a pioneering MFI in Islamic micro loans in Malaysia (EONCap Islamic Bank) over the period 2006-2012. The results of an OLS regression show that the specificities of IMFIs and the macroeconomic environment affect financial performance: it is negatively determined by the price of fuel and positively by cost efficiency, the capital ratio, inflation and GNI per capita.

Fersi and Boujelbene (2016) use OLS regressions to investigate the determinants of performance upon a worldwide sample of 333 CMFIs and 49 IMFIs over 1996-2012. The number of active borrowers (NAB) in CMFIs has a negative influence upon their social performance as measured by the average loan balance per borrower, although age and size have a positive influence. Conversely, the influence of NAB upon the average loan balance is positive for IMFIs. The effect of Portfolio at Risk upon financial performance (Return On Assets - ROA) is positive for CMFIs and negative for IMFIs. There is an obvious bias regarding the subsample of the MENA region wherein the number of IMFIs (18) outstrips that of CMFIs (15).

3. SAMPLE AND DATA, VARIABLES AND METHODOLOGY

3.1 Data and sample

Our data come mainly from the Microfinance Information Exchange database (MIX) and, in addition, recent reports on the social performance of MFIs (SPS) developed by the MIX, are sometimes supplemented by annual reports specific to MFIs.

Table 2. Sample distribution according to MFI types and countries

MFI Country	Egypt	Iraq	Jordan	Morocco	Tunisia	Lebanon	Palestine	Yemen	Syria	Bahrain	Total
CMFIs	13	7	6	10	1	4	3	3	2	0	49
IMFIs		4	2			1	5	4	1	1	18
Window		*3*	*2*			*1*	*3*		*1*		*10*
Sole business		*1*					*2*	*4*		*1*	*8*
Total	13	11	8	10	1	5	8	7	3	1	67
GNI per capita PPP constant 2011 $	9,813	13,189	10,230	6,633	9,723	15,728	4,668	3,357	Na	34,534	11,454 (mean for MENA)

***Source*:** Authors from Sanabel (2012) and World Bank.

The sample consists in an unbalanced panel of 67 MFIs in 10 countries from the

MENA region over the period 2008-2019. MFIs from Sudan and Iran, wherein the financial system is entirely Islamic were excluded to avoid sampling bias. More than two thirds of MFIs are NGOs and over a quarter consists in IMFIs; these are specific departments (Window), or institutions that specialize exclusively in Islamic finance (Sole business), which represent half of the cases in the MENA region, including Yemen (See Table 2).

3.2. ASSUMPTIONS AND VARIABLES

We test five assumptions with respect to the controversial conclusions from literature.

1. ***Hypothesis H1:*** Being an IMFI has a positive effect upon financial performance.
2. ***Hypothesis H2***: Default risk is lower for IMFIs than for CMFIs.
3. ***Hypothesis H3:*** Subsidies are higher for IMFIs than for CMFIs as well as their financial performance.
4. ***HypothesisH4:*** Being an IMFI has a positive effect upon social performance.
5. ***Hypothesis H5:*** IMFIs target less women than CMFIs.

Similarly, we choose the variables according to the literature upon the determinants of financial and social performance with respect to CMFIs and IMFIs .We use two variables for the measurement of financial performance of MFIs: return on assets (ROA) and operation self-sustainability (OSS).Both ratios are available from the MIX; they are positively and very significantly correlated.

Social performance is measured with an index of social outreach (Depth), which identifies the clients targeted by the MFI: the more average loan amount per borrower is below the poverty line ($ 2 a day per capita), according to Gross National Income per capita (GNI), and the more MFIs are pro poor-oriented (Adair and Berguiga, 2014). Although social outreach (Depth) is correlated positively with ROA and negatively with OSS, there is no significant linear relationship between social and financial performance.

According to the determinants of social and financial performance for MFIs in the MENA region (Adair and Berguiga, 2010, 2014), four social variables contribute to the social performance of MFIs: the percentage of female borrowers (WB),the number of active borrowers (Size), joint-liability loan (Group) and the rural operating area of MFIs (Rural).The financial performance of MFIs depends upon the revenue from loan portfolio, productivity of staff (PP), costs per borrower (CE)and the quality of portfolio at risk (PAR). In addition, the capital structure, such as subsidies (Subs) and leverage (L) variables, affects financial performance.

Other variables influence both the social and financial performance: age of the MFI (Age and possibly Age 2), economic growth (GDP growth) and inflation (Adair and Berguiga, 2015a). In order to distinguish IMFIs from CMFIs, we first include a dummy (Islamic) that takes the value 1 if the MFI grants Sharia-compliant services(IMFI) and 0 otherwise (CMFI).We split this variable into two additional dummies. Sole business takes the value 1 if the MFI grants exclusively Sharia-compliant services and 0 otherwise. Window takes the value 1 if the MFI grants both Sharia-compliant and conventional services and 0 otherwise. Table 3 below shows all the variables used in this paper.

Table 3. Variables Used in the Research

Variables		Definitions	Sources
Financial performance	***ROA* (Return on assets)**	Net operating income before subsidies /Total average assets	MIX
	***OSS*(Operation self-sustainability)**	Financial income + other operating income / Loan loss provisions + operating expenses	
Social performance	***Depth* (Depth of outreach)**	Difference between the poverty line ($ 2 a day per capita) and the average loan amount per borrower (AL) based on Gross National Income (GNI) per capita.	WDI, MIX, PovcalNet
Type of MFI	***Islamic***	Qualitative (Islamic *vs.* Conventional)	MIX
	Window	Qualitative (0,1)	Sanabel
	Sole business	Qualitative (0,1)	Sanabel
Financial variables	***Yield***	Financial income(Interest and fees)/ Loan Portfolio	MIX
	***CE* (Cost per borrrower)**	Operating expenses/ Number of borrowers	MIX
	***PP*(Productivity of personnel)**	Number of borrowers / Number of staff	MIX
	***PAR*(Portfolio at risk)**	Portfolio at risk>30 days / Loan Portfolio	MIX
	***Subs* (Subsidies)**	Subsidies /Total assets	
	***L* (Leverage)**	Debt / Equitys	
Social variables	***WB***	Percentage of female borrowers	MIX
	***Group*(Loan methodology)**	Qualitative (Group *vs.*Individual loan)	MIX(SPS)
	***Rura*l (Operating area)**	Qualitative (rural *vs.* urban)	MIX (SPS)
	Size	Ln(Number of active borrowers)	MIX
Control variables	***Age***	Difference between the year of observation and date of establishment	MIX
	Age2	Age *Age	
	Inflation	Rate of inflation	WDI
	GDP growth	GDP growth rate	WDI

***Source*:** Authors (2020).

3.3. DESCRIPTIVE STATISTICS OF THE VARIABLES

Islamic is significantly and negatively linked to social outreach and Return on assets (Table 4): the more MFIs are Islamic, the less they are profitable and pro poor-oriented, albeit they may achieve operation self-sustainability. With a negative Depth, Sole business IMFIs target customers above the poverty line of $2 a day per capita (Table 4).They also experience a 100 per cent lower profitability than CMFIs.

Sole business and the cost per borrower (CE) are positively and significantly correlated .Sole business IMFIs bear higher costs ($891,006) than Window IMFIs ($158,225) and CMFIs ($129,542) (Table 4). Portfolio at risk is twice higher than that of CMFIs. This may be explained by the fact that IMFIs have only been operating for six years on average and thus have not matured yet.

Window is significantly and negatively correlated with Yield and Group. Window IMFIs include Islamic services with low returns that lessen financial performance. However, they grant less joint-liability loans than Sole business MFIs and other CMFIs.

IMFIs have three financing sources: donations , deposits and commercial credit. IMFIs experience a very low leverage (0.1 per cent) and a very high subsidy ratio (49 per cent) as compared to CMFIs. Although it is very high, equity consists in subsidies for two thirds on average. Window IMFIs benefit especially the most from these subsidies: in as much as their social outreach is low, could it be that these MFIs use an Islamic window only to access free financial resources?

Table 4 .Descriptive statistics by category of MFIS

		WB	*Depth*	*ROA*	*OSS*	*Yield*	*CE*	*PP*	*PAR*	*Subs*	*Size*	*Rural*	*Group*	*Age*	*Leverage L*	*Subsidies/ Equity*
CMFIs	Mean	0.606	0.022	0.037	1.304	0.317	129.542	141.046	0.045	0.324	3.011	0.372	0.513	12.454	3.807	0.531
	SD	0.264	0.653	0.108	0.503	0.096	144.648	70.982	0.093	0.370	1.601	0.484	0.500	9.843	33.413	0.591
IMFIs	Mean	0.590	-0.257	0.003	1.528	0.230	422.65	106.091	0.089	0.424	2.046	0.336	0.206	10.240	-0.001	0.685
	SD	0.320	0.620	0.111	1.522	0.128	1035.735	53.549	0.145	0.304	1.477	0.475	0.406	6.108	19.305	3.147
Window	Mean	0.555	0.326	0.028	1.576	0.21	158.255	111.214	0.092	0.491	2.019	0.388	0.059	12.149	1.09	0.864
	SD	0.318	0.317	0.083	0.857	0.095	115.931	55.938	0.148	0.289	1.022	0.490	0.238	5.123	3.802	1.070
Sole business	Mean	0.660	-0.127	-0.037	1.443	0.252	891.006	94.963	0.083	0.282	2.097	0.214	0.533	6.783	-1.978	0.307
	SD	0.0317	0.951	0.136	2.285	0.168	1628.354	46.940	0.141	0.289	2.095	0.417	0.507	6.289	32.150	5.378
Total MFIs	Mean	0.603	-0.041	0.029	1.355	0.298	194.902	133.670	0.054	0.345	2.789	0.364	0.445	11.949	2.933	0.563
	SD	0.277	0.655	0.109	0.857	0.110	518.127	69.113	0.108	0.359	1.624	0.481	0.497	9.168	30.774	1.529

Source**:** Authors (2020).

Demand for Islamic services is measured with the logarithm of the number of active borrowers and proves rather low. However, there are significant differences between IMFIs and CMFIs as well as between Window and Sole business IMFIs, according to standard deviations of the determinants that impact performance.

3.4. METHODOLOGY

We designed two panel data models. The first one expresses financial performance with two dependent variables (OSS and ROA). The second one expresses social performance (Depth). The dependent variable in each model is explained by the dependent variable of the other model in order to study the relationship between social and financial performance. Financial, social and control variables are the explanatory variables of both performances that shows below:

Equation (1): Financial performance

$$Y_{it} = \lambda_{it}Type\ of\ MFI_{it}+\alpha_{1it}Depth_{it} + \alpha_{2it}(Depth_{it}*Type\ of\ MFI)+\beta_{1it}Financial\ variables_{it}+\beta_{2it}(Financial\ variables_{it}*Type\ of\ MFI) +\varphi_{it}Control\ variables_{it}+\varepsilon_{it}$$

Equation (2): Social performance

$$Depth_{it}\ \phi_{it}Type\ MFI_{it}\quad \eta_{1it}Y_{it}+ \eta_{2it}(Y_{it}*Type\ variables_{it}*Type\ of\ MFI) + of\ MFI)+ \zeta_{1it}Social\ variables_{it} +\zeta_{2it}(Social\ variables_{it}*Type\ of\ MFI+ \theta_{it}Control\ variables_{it}+\mu_{it}$$

Y_{it} expresses the financial performance ofthe ith MFI at date *t*, measured by *ROA* and *OSS*.
$Depth_{it}$ expresses the social performance of the ith MFI at date *t*, measuring outreach.
ε_{it} et μ_{it} are the error terms in the two models of individual *i* at date *t*.

We use the dummies regarding the type of MFI (Islamic, Window and Sole business) in both models: in the first place, as independent variables and, in the second place, as interacting variables with other independent variables included in the models. The omitted type is CMFIs.

In a first step, only the Islamic type of MFI is investigated. Interactions of the IMFI with the social scope (Depth*Islamic) and each financial variable (Yield*Islamic, PP*Islamic, CE*Islamic, PAR*Islamic, Subs*Islamic and L*Islamic) in Equation 1 compares IMFIs with CMFIs, regarding the effect of Sharia compliance upon financial performance. For instance, the coefficient α1 represents the effect of Depth upon the FP for the CMFIs; the coefficient α2 associated with the variable (Depth*Islamic) measures the change in the effect of Depth on the FP in the case of an IMFI. The summation of the two coefficients (α1 + α2) provides the

effect of Depth on the FP of IMFIs.

In Equation 2, interaction of the Islamic variable with the variables of financial performance and each social variable enables to observe the effects of these variables on social performance according to the Islamic type of MFIs and, specifically, if Sharia compliance affects SP compared to the CMFIs.

In a second step, Window and Sole business IMFIs are simultaneously included in both models. It takes care of interactions of these two types of MFIs with social variables it compares Sole business and Window IMFIs with CMFIs as well as between these two types of IMFIs. In Equation 1, the matrix of α2 coefficients includes a coefficient for Depth*Window and another one for Depth*Sole business. It shows how the effects of Depth vary according to types of IMFIs. Each coefficient also measures the difference between the type of IMFIs and CMFIs as regards the impact of Depth.

The FGLS method was selected for several reasons. First, coefficients of the time-invariant variables such as Sole business and Group*Islamic cannot be estimated with the within method. The instrumental variables method (Hausman and Taylor, 1981) cannot either apply as models with interaction effects generate strong correlations between the independent variables and interacting independent variables. Second, the Group, Rural, and Islamic variables vary little over time; hence, applying the fixed-effects estimates would lead to a massive loss of degrees of freedom (Baltagi, 2008; Wooldridge, 2002). Third, both equations include the same macroeconomic variables (GDP and inflation) for all MFIs operating in the same country during the same year.

4. Results and discussion

4.1 Financial performance

The estimate of financial performance in equation 1 compares CMFIs to IMFIs (See first two columns in Table 4 below). However, a few variables prove insignificant. A breakdown of the overall sample into sub-samples, specifically Islamic MFIs into the two categories of Sole business and Window IMFIs, may explain non-significance and enables to compare IMFIs with CMFIs (See last two columns in Table 4).

Table 4. Estimate of the financial performance model

	Sample		Sub-sample	
Variables	**ROA**	**OSS**	**ROA**	**OSS**
Islamic	0.0691 (0.9316)	1.6631 (0.9598)		
Sole business			-0.1577*** (-3.2166)	5.9077 (1.1260)
Window			0.1513** (2.3012)	1.1191** (2.1451)
Depth	0.1004*** (-4.1825)	-0.6461*** (-3.2007)	-0.1092*** (-4.8527)	-0.7426*** (-5.0841)
Depth*Islamic	0.0836* (1.7750)	0.2742 (0.5580)		
Depth*Sole business			0.0396 (0.8022)	1.1143 (1.2723)
Depth*Window			0.0922 (1.4350)	0.3792 (1.1806)
Yield	0.4116*** (6.4772)	1.5948*** (4.0557)	0.3971*** (6.4232)	0.7436** (2.0594)
Yield*Islamic	-0.3196** (-2.1608)	-3.7151 (-0.9996)		
Yield*Sole business			-0.2459** (-2.3094)	-14.8558 (-1.4236)
Yield*Window			-0.2415 (-1.2169)	0.5942 (0.5224)
CE	0.0003*** (-4.2912)	-0.0019*** (-4.5517)	-0.0003*** (-4.7821)	-0.0019*** (-4.3624)
CE*Islamic	0.0003*** (3.3694)	0.0013 (1.5925)		
CE*Sole business			0.0003*** (3.7881)	0.0008 (0.4969)
CE*Window			0.0002* (1.6792)	-0.0015 (-1.4087)
PAR	0.1699*** (-2.6668)	-0.7994** (-2.5154)	-0.1645** (-2.2268)	-0.6508 (-1.2337)
PAR*Islamic	-0.0369 (-0.2723)	-1.7739 (-1.4414)		
PAR*Sole business			0.0811 (0.6912)	0.0280 (0.0067)
PAR*Window			-0.1152 (-0.7157)	-2.2475*** (-2.7103)
PP	0.0005*** (5.7095)	0.0025*** (3.0081)	0.0005*** (5.6243)	0.0016*** (3.3344)
PP*Islamic	-0.0001 (-0.3342)	-0.0031 (-0.8150)		

PP*Sole business			0.0018*** (5.9073)	0.0036 (0.2263)
PP*Window			-0.0006*** (-2.6169)	-0.0056*** (-2.9726)
L	-0.0013* (-1.7405)	-0.0112* (-1.8592)	-0.0012 (-1.4126)	-0.0013 (-0.2692)
L*Islamic	0.0011 (1.4494)	0.0111* (1.8077)		
L*Sole business			0.0008 (1.0213)	0.0004 (0.0537)
L*Window			-0.0038*** (-3.6818)	-0.0309** (-2.3171)
Subs	0.0073 (0.7260)	0.2150 (1.3736)	0.0101 (0.9451)	0.3209** (2.5703)
Subs*Islamic	0.0020 (0.0496)	-0.4750 (-0.7656)		
Subs*Sole business			-0.0654 (-0.8314)	0.0423 (0.1023)
Subs*Window			-0.0221 (-0.7455)	-4.8462* (-1.8310)
Age	0.0010 (0.5667)	0.0043 (0.2614)	0.0000 (0.0074)	0.0152 (1.0527)
Age2	-0.0000 (-0.7227)	0.0001 (0.2636)	-0.0000 (-0.1692)	-0.0001 (-0.5219)
Group	-0.0150 (-1.5266)	-0.0994 (-1.3678)	-0.0181* (-1.7805)	-0.1330** (-2.4435)
Rural	0.0050 (0.7974)	0.0492 (0.5754)	0.0026 (0.4018)	-0.0502 (-0.8910)
GDP	0.0688 (1.0072)	-0.9909 (-0.5297)	0.0344 (0.5312)	0.4199 (0.3624)
Inflation	0.0914 (0.8686)	2.7708* (1.8549)	0.1060 (0.9798)	2.1068*** (3.0460)
Observations	369	370	369	370
Number of MFIs	63	63	63	63
Breusch Pagan	0.0000	0.0000	0.0000	
R-squared	0.4581	0.1312	0.4890	0.456

***, ** and* denote respectively p < 0.01, p < 0.5 and p < 0.1. Robust t-statistics in parentheses. Last column shows results from OLS. In as much as the Breusch-Pagan test is above 5 per cent for FGLS, they do not apply.

4.1.1 Financial performance: Conventional MFIs vs. Islamic MFIs

Being an Islamic MFI has no impact upon Return on assets (ROA) or Operation self-sustainability (OSS). The Islamic interaction variable proves insignificant: IMFIs cannot be assessed as more (or less) financially successful than CMFIs. H1 hypothesis is untested. Lack of difference in financial performance between IMFIs and CMFI may be explained by the remarkable weight of NGOs, alongside Window IMFIs that are mainly conventional MFIs in our sample. This result is similar to that of Ben Abdelkader and Ben Salem (2013) but opposite to that of Mahmood et al. (2014), Widiarto and Emrouznejad (2015) and Tamanni and Liu (2015).

Social Performance (Depth) has a negative and very significant impact on the financial performance (ROA and OSS) of CMFIs. CMFIs targeting the poor do not ensure financial performance, because granting small amounts of microcredit leads to excessive administrative costs (Adair and Berguiga, 2014). The interaction of Depth*Islamic variable with ROA is positive and weakly significant. Being an IMFI lessens the negative impact of social performance upon financial performance: Summing up the coefficients shows that the decline in ROA is 10.04 per cent for CMFIs and 1.68 per cent for IMFIs.

The portfolio revenue (Yield) is positive and highly significant for CMFIs: Rising interest rates improves their financial performance (ROA and OSS). Interaction of Yield*Islamic variable with ROA is negative and significant: There is little impact of portfolio revenue upon FP for IMFIs: A one per cent increase in portfolio revenue drives an increase in ROA of 9.2 per cent for IMFIs and 41.16 per cent for CMFIs. This result can be explained by the absence of interest in Sharia-compliant services.

The higher the cost per borrower (CE), the lower financial performance (ROA and OSS) of the CMFIs (Adair and Berguiga, 2014). Being an IMFI lessens the negative effect of cost per borrower upon FP but the sum of coefficients associated with CE and CE*Islamic variables is not significantly different from zero: Costs per unit processed do not have a robust impact upon financial performance for IMFIs. This result is in line with that of Mahmood et al. (2014), but opposes that of Ahmed (2002), Tamanni and Him (2015) and Ibrahim et al. (2016).

The coefficients of PAR and PAR*Islamic variables prove negative: A higher portfolio at risk has a greater negative impact upon the financial performance (ROA and OSS) of IMFIs than for CMFIs. However, the coefficient of PAR*Islamic variable is not significant. H2 hypothesis stating IMFIs experience a lower default risk is not verified. Staff productivity (PP) has a positive effect on the financial performance (ROA and OSS) of MFIs, whether conventional or Islamic. This finding opposes that of Ahmed (2002) and Rahman (2010).

Leverage (L) exert a negative and significant effect upon the FP (ROA and OSS) of CMFIs. The more a CMFI is indebted, the less it is financially successful. Being an IMFI lessens this impact from 1.12 to 0.01 per cent: IMFIs are little indebted and heavily subsidized. However, coefficients of the Sub and Sub*Islamic variables are not significant. H3 hypothesis stating a positive effect of subsidies on the financial performance of IMFIs is not verified.

Coefficient associated with the inflation macroeconomic variable is significantly positive with OSS. High inflation encourages MFIs to raise nominal rates applied to customers to cover inflation and costs, to avoid deterioration in their loan portfolio and to increase eventually their financial performance (Adair and Berguiga, 2015b).

4.1.2 Financial performance: Sole business IMFIs vs. Window IMFIs

The results of regressions on sub-samples confirm the robustness of those obtained previously from the overall sample (Table 4): portfolio revenue (Yield), the cost per borrower (CE), the portfolio at risk (PAR), staff productivity (PP), social outreach (Depth) and inflation are the determinants of financial performance (ROA and OSS) of CMFIs; as for IMFIs, return on assets is similarly determined by Yield and CE as well as leverage (L).

Being a Sole business IMFI affects negatively and very significantly ROA. Low profitability confirms descriptive statistics and the results of Tamanni and Liu (2015). Conversely, being a Window IMFI has a positive and significant effect on ROA and OSS. H1 hypothesis of better financial performance is verified for Window IMFIs, which gained experience as CMFIs in improving management costs and implementing better risk management mechanisms to achieve financial performance. In the absence of interest rates, the financial performance of Sole business IMFIs remains comparatively low and we cannot speculate whether investment funds over time can achieve equivalent performance as suggested by Widiarto and Emrouznejad (2015).

The Depth interacting variables are not significant: the slightest effect of the SP-FP trade-off for IMFIs that was identified in the overall sample, no longer remains for any of the two types of IMFIs. Conversely, the weakest impact of portfolio revenue upon ROA for Sole business IMFIs is very significant: as for Yield*Sole business only.

The negative impact of cost per borrower on profitability is more important for Window than for Sole business IMFIs. However, the sum of CE coefficients with CE*Sole business, and with CE*Window are not significantly different from zero; which implies the absence of a robust relationship between FP and the cost per borrower for any of the two types of IMFIs. It confirms the previous finding from the overall sample but contradicts descriptive statistics indicating high operating expenses for IMFIs.

Usually, payback delays affect negatively the financial performance of MFIs. This impact is higher and very significant for Window IMFIs, whereas it is lower for CMFIs and eventually Sole business IMFIs. H2 seems checked for Sole business IMFIs, although the PAR*Sole business variable is not significant. Window IMFIs may experience difficulties in risk management as regards the offering of different services, both Islamic and conventional.

The effect of staff productivity on the financial performance of IMFIs is very significant for both types. Coefficient of the PP*Window variable is negative, whereas that of PP*Sole business is positive. The impact of productivity upon ROA is higher for Sole

business IMFIs than for Window IMFIs and CMFIs, although it proves very weak.

In line with descriptive statistics, leverage exerts a negative and significant impact on ROA and OSS of Window IMFIs, which is characterized by a very low debt and whose resources are mainly subsidies. In addition, subsidies for Window IMFIs have a negative impact upon OSS, whereas impact is positive but insignificant for Sole business MFIs. As primary source of financing, subsidies may be a disincentive to the improvement of operation self-sustainability: Becoming structurally dependent on subsidies, MFIs may not prove an ever-lasting programme. H3 hypothesis is not verified. The Group variable is significant: the granting of group loans affects negatively both ROA and OSS for MFIs, which prefer granting individual loans with a higher amount to a smaller but less poor clientele (Adair and Berguiga, 2010; 2014).

4.2 Social performance

Table 5 provides the results of the estimation of social performance in equation 2, comparing CMFIs to IMFIs in the global sample (the first two columns in Table 4); then comparing the two subsamples for Sole business and Window IMFIs as well as with CMFIs (the last two columns in Table 5).

Table 5. Estimate of the social performance model

	Sample		**Sub-sample**	
Independent variables	***Depth***	***Depth***	***Depth***	***Depth***
Islamic	-0.2527(-0.5705)	-0.2304(-0.4696)		
Sole business			-1.0026(-1.2253)	-0.7818(-1.0183)
Window			-0.0527(-0.1651)	-0.0510(-0.0947)
ROA	-0.0017(-0.0076)		0.0078(0.0369)	
ROA*Islamic	-0.2615(-0.4849)			
ROA*Sole business			-0.8401(-1.6094)	
ROA*Window			0.1634(0.2102)	
OSS		-0.0046(-0.0907)		-0.0045(-0.0901)
OSS*Islamic		0.0000(0.0006)		
OSS*Sole business				-0.0010(-0.0193)
OSS*Window				-0.0268(-0.2137)
Group	0.0172(0.2863)	0.0196(0.3397)	0.0157(0.2734)	0.0160(0.2885)
Group*Islamic	0.5789(1.4733)	0.5856(1.4779)		
Group*Sole business			1.2536**(1.9925)	1.3229*(1.9313)
Group*Window			-0.0940(-0.2907)	-0.2060(-0.6759)
WB	0.6536***(3.6990)	0.6596***(3.6974)	0.6186***(3.6353)	0.6400***(3.6280)
WB*Islamic	-0.5258(-1.1951)	-0.5042(-1.1940)		
WB*Sole business			-0.3221(-1.0194)	-0.3932(-1.2614)
WB*Window			-0.3056(-0.6456)	-0.2214(-0.4519)
Rural	0.0704*(1.7874)	0.0715*(1.8081)	0.0707*(1.7891)	0.0753*(1.8596)
Rural*Islamic	0.2977(0.7533)	0.3093(0.7837)		
Rural*Sole business			0.9330**(2.4427)	0.8527**(2.4411)
Rural*Window			-0.0162(-0.0838)	-0.0477(-0.2375)
Size	0.0013(0.1010)	0.0010(0.0781)	0.0020(0.1510)	0.0019(0.1504)
Size*Islamic	0.1986(1.4232)	0.1806(1.3454)		
Size*Sole business			0.2447(1.1154)	0.1226(0.6461)
Size*Window			0.1164(1.5473)	0.1237*(1.6551)
Age	-0.0241**(-2.3624)	-0.0247**(-2.4502)	-0.0259**(-2.4534)	-0.0265***(-2.5989)
Age2	0.0004*(1.9157)	0.0004*(1.9542)	0.0004*(1.9298)	0.0004**(2.0040)
GDP	-0.6640*(-1.7292)	-0.6534*(-1.7414)	-0.7268*(-1.8231)	-0.6776*(-1.6814)
Inflation	0.3558(1.2183)	0.3484(1.2220)	0.3430(1.1757)	0.3277(1.1397)
Observations	412	420	412	420
Number of MFIs	64	64	64	64
Breusch Pagan	0.0000	0.0000	0.0000	0.0000
R-squared	0.1582	0.1532	0.1432	0.1275

***Source*:** Authors (2020).

4.2.1 Social performance: Conventional MFIs vs. Islamic MFIs

The Islamic variable has a negative but insignificant effect. H4 hypothesis of a positive relationship between the nature of the MFI (Islamic) and social performance cannot be verified. This result does not confirm either that of Tamanni and Liu (2015) or Widiarto and Emrouznejad (2015) according to which IMFIs are less socially performing than CMFIs. As for social outreach, CMFIs and IMFIs may not be significantly different (Ben Abdelkader and Ben Salem, 2013).

Financial performance (ROA and OSS) has a negative impact on social performance (Depth) of MFIs. However, all coefficients are non-significant. Similarly, the granting of group loans has no significant effect on the social impact of IMFIs or CMFIs (Hartaska, 2005; Adair and Berguiga, 2014).

Consistent with previous works (Guerin and Landing, 2006; Adair and Berguiga, 2014), the percentage of female borrowers (WB) and Rural area are the two main determinants of social outreach (Depth) of CMFIs. The coefficient of WB*Islamic is negative, suggesting that IMFIs target less the women, but it is not significant. Hence, H5 hypothesis cannot be verified. The relationship between age and social performance is non-linear: It takes a "U" form, suggesting a trade-off between SP and FP. The sign of Age is negative while that of Age2 is positive and both coefficients are significant.

Among the control variables, only GDP is significant. Economic growth generally lessens the likelihood of targeting the poor, because the MFI grant higher loan amounts that serve a less poor clientele; accordingly, the poor are neglected.

4.2.2 Social performance: Sole business IMFIs vs. Window IMFIs

After splitting IMFIs into Sole business and Window categories, the results show that solidarity loans (Group), operating area (Rural), the number of borrowers (Size), age (Age) and economic growth (GDP) determine the social performance of IMFIs. Sole business and Window variables are negative and insignificant. Being an IMFI, whether Sole business or Window, has no effect on social performance as in the overall sample. H4 hypothesis is not verified.

Unlike CMFIs and Window IMFIs, the granting of group loans to poor families has a positive and significant impact on the social performance of Sole business IMFIs. However, the coefficients of the Women Borrowers interacting variables are not significant and the targeting of women cannot be assessed. Hence, the H5 hypothesis is not verified.

Coefficient of the Rural variable is positive and weakly significant; that of Rural*Sole business being very positive. Operating in rural areas has a greater positive effect on the social outreach for Sole business IMFIs than for CMFIs and Window IMFIs. Coefficient of the Size*Window variable is positive and weakly significant. Window IMFIs cater to a wider customer base as compared to Sole business: Being a Window IMFIs allows to target the poor, both Muslims and non-Muslims addressing a larger range of services specific to customer needs.

5. CONCLUSION

Our study is original with respect to methodology and sampling. We use two econometric models with interaction variables on a panel of 67 MFIs in the MENA region, including 18 IMFI over 2008-2019. Our results prove more robust than the descriptive analysis (DEA) of small samples used in many papers on Islamic microfinance. For the first time, we distinguish Sole business IMFIs from Window IMFIs to compare their performance. We test five hypotheses, three of which are related to financial performance (H1, H2, H3) and two to social performance (H4, H5).

Our results suggest there is a trade-off between financial performance and social

performance, regardless Islamic or conventional MFIs. The main determinants of financial performance for Sole business or Window IMFIs are the income from Islamic products, expenses and financing structure. Product diversification (Islamic and conventional) contributes to better financial performance for Window IMFIs than Sole business IMFIs and CMFIs. However, hypotheses related to financial performance are not verified.

Sole business IMFIs differ from CMFIs and Window IMFIs by their specialization in Islamic microfinance: Targeting the poorest affects to a lesser extent their economic sustainability; there is a higher impact of staff productivity; granting group loans and operating in rural areas increase their social outreach. However, hypotheses related to social performance are not verified. Admittedly, our subsample is small (18 IMFIs) and is overweighed by the number of Sole business IMFIs from Yemen. Our current research focuses on the link between the financing structure and governance of MFIs in the MENA region. It aims to deepen the role of subsidies (donations) vs. the absence of subsidies upon the performance of MFIs.

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