

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

# Research in International Business and Finance

journal homepage: [www.elsevier.com/locate/ribaf](http://www.elsevier.com/locate/ribaf)

Full length Article

## Islamic finance development and banking ESG scores: Evidence from a cross-country analysis



Andrea Paltrinieri<sup>a,\*</sup>, Alberto Dreassi<sup>b</sup>, Milena Migliavacca<sup>c</sup>, Stefano Piserà<sup>d</sup>

<sup>a</sup> Department of Economics and Statistics, University of Udine, Via Tomadini 30/A, 33100, Udine, Italy

<sup>b</sup> University of Trieste, Italy

<sup>c</sup> Università Cattolica del Sacro Cuore (Milan), Italy

<sup>d</sup> University of Udine, Italy

### ARTICLE INFO

#### JEL classification:

G21  
G29

#### Keywords:

Islamic finance  
ESG  
CSR  
Banking  
IFDI

### ABSTRACT

An extensive body of literature on CSR examined its effects on several business dimensions. However, little attention has been paid on the relationship between the growing role played by Islamic finance, its connection with sustainability and the drivers of such relationship.

Based on a sample of 224 banks from sixteen emerging and advanced countries in the period 2014–2017, this paper assesses whether and to what extent the development of Islamic financial markets relates to banks' sustainability strategies. We propose a novel perspective that includes the new Islamic Finance Development Indicator (IFDI), its components and how it relates to aggregate and individual ESG scores.

Our results show a positive relationship between IFDI and ESG scores that mostly revolves around the social pillar. This finding strengthens the generally acknowledged link between Islamic finance and sensitivity to social implications, despite gains in sustainability are subject to non-linearity.

### 1. Introduction

The literature on Corporate Social Responsibility (CSR) is rich. Since its inception, it provides a persuasive stakeholder-oriented alternative to the classical profit-maximization theory of the firm. Despite findings are still subject to academic debate, CSR engagement is often found beneficial in terms of profitability and risk reduction.

Several findings (f.i. [Sassen et al., 2016](#); [Hoje and Haejung, 2012](#); [Cai et al., 2012](#)) support a different sensitivity of specific business sectors to CSR in terms of firm-risk and firm-value. For banks, the literature provides evidence of gains in performance and risk-taking associated with a strategic involvement in CSR, in particular for the governance dimension. However, results are less conclusive for emerging markets.

A growing academic scrutiny involves CSR and Islamic finance, with the latter being expected to be more sensitive to sustainability due to its peculiar founding principles. However, in this field results are even more inconclusive, with results concentrated especially on the beneficial role on corporate ethics attributable to Sharia supervisory boards. Additionally, the existing literature is mainly focused on countries where Islamic finance is prominent, often on Islamic banks in contrast with their conventional counterparts or, more recently, linking their operations to the Socially Responsible Investments (SRI) research stream.

\* Corresponding author at: Department of Economics and Statistics, University of Udine, Via Tomadini 30/A, 33100, Udine, Italy.

E-mail addresses: [andrea.paltrinieri@uniud.it](mailto:andrea.paltrinieri@uniud.it) (A. Paltrinieri), [adreassi@units.it](mailto:adreassi@units.it) (A. Dreassi), [milena.migliavacca@unicatt.it](mailto:milena.migliavacca@unicatt.it) (M. Migliavacca), [steo-@hotmail.it](mailto:steo-@hotmail.it) (S. Piserà).

<https://doi.org/10.1016/j.ribaf.2019.101100>

Received 28 January 2019; Received in revised form 26 August 2019; Accepted 1 September 2019

Available online 04 September 2019

0275-5319/ © 2019 Elsevier B.V. All rights reserved.

The main motivation and related research questions of this study can be summarized as follows. Firstly, we contribute to the literature by filling the gap represented by CSR and banking in a cross-country setting with different stages of Islamic finance development. This main objective is significantly current and relevant, if we consider the recent promotion of Sustainable Development Goals (SDG) by the United Nations and in the light of the World Bank's call for exploiting sustainability benefits implicit in Islamic finance development potential (Ahmed et al., 2015).

*RQ1. Is there a link between the development of Islamic finance in advanced and developing economies that supports its stronger role in promoting sustainability?*

We contribute to the literature by empirically testing the hypothesis of Islamic finance as a system naturally designed to promote sustainable development and to encourage CSR in the global business context. Islamic finance, by limiting leverage, speculation and uncertainty, should positively contribute to CSR. This would imply a general interest also outside Islamic countries in achieving further development in order to promote social responsibility and sustainable financial solutions.

Moreover, this is the first paper adopting the Islamic Finance Development Indicator (IFDI) to address this issue, and to demonstrate which of its components are leading indicators of CSR.

Secondly, due to the composite nature of CSR scores, we are interested in measuring if the role played by Islamic finance is limited to social implications, as shown by existing literature, or extends to the environmental and governance pillars.

*RQ2. Which of the components of CSR scores show a positive association with the development of Islamic finance?*

Thirdly, we explore if the relationship between Islamic finance development and sustainability is non-linear and if a structural break exists in CSR gains that allows to assess how sizeable the future contributions in this area might be, provided that a causal relationship can be empirically tested.

*RQ3. Is the development of Islamic finance a channel for further gains in CSR scores?*

Our main results stress a positive, causal and non-linear relationship between Islamic finance development and sustainability, especially driven by the quantitative development and within the social pillar of CSR. Additionally, we corroborate the argument attributing to Islamic finance a significant role in achieving greater sustainability and the connected benefits.

The remainder of this paper is structured as follows. In Section 2 we review the relevant literature. In Section 3 we describe our dataset, variables and methodological strategy. In Section 4 we discuss our findings. Finally, Section 5 concludes our paper and summarizes our policy implications.

## 2. Literature review

### 2.1. CSR and the non-financial sector

Since its origins, the CSR theory provides a convincing stakeholder-oriented alternative to the classical shareholder-centric profit-maximization view of the firm, that involves environmental, social and governance business factors (Elkington, 1999).

Despite this apparent contrast<sup>1</sup>, Dowell et al. (2000) provide seminal research on the positive effect of environmental performance on firms' market value. Since then, the impact of CSR on performance received greater academic scrutiny.

Without any ambition to thoroughly review this rich field of research, the increasing public attention on executive pay, company failures and volumes of sustainable investments, among others, underlines how there is no mutual exclusion between contributing to shareholder value and the triple bottom line approach (Kitzmueller and Shimshack, 2012).

More recent papers keep confirming the relationship between CSR and firms' market value (Ferrell et al., 2016): CSR engagement seems to reduce the detrimental link between managerial entrenchment and value. Cavaco and Crifo (2014) explore the same relationship on 300 firms over the period 2002–2007, showing that responsible behavior towards employees (the human resources dimension), as well as customers and suppliers (the business behavior dimension), appear as a complementary input that fosters financial performance, with mutual benefits and less conflicts between stakeholders. Targeting controversial firms, Cai et al. (2012) find evidence of a positive relationship between CSR engagement and firm value, supporting its role of a value-enhancer.

CSR has been also explored from a risk-management perspective. By investigating the impact of environmental, social and governance (ESG) factors on firms' riskiness, Sassen et al. (2016) find a strong negative effect of CSR on total and idiosyncratic risk. Moreover, they underline a strong influence only for the environmental and social dimensions.

Conversely, Becchetti et al. (2015) stress a positive relationship between CSR and idiosyncratic volatility, considering a sample of listed US firms in the period 1992–2010. They argue that CSR lowers specific stakeholders' risks through a negative impact on idiosyncratic volatility. Within the same stream of research, Jo and Na (2012) explore the sensitivity of controversial business sectors to CSR during the period 1991–2010 in the US, finding it greater than for non-controversial business. Consistently, Hoje and Haejung (2012) show that CSR engagement inversely affects firm risk in controversial industries. This finding is particularly interesting, if read inversely, for Islamic finance.

### 2.2. CSR and banking

The role of CSR has been widely explored also in the banking sector. Meng-Wen and Chung-Hua (2013) highlight three

<sup>1</sup> A remarkable seminal discussion of this controversy can be found in Fulton Friedman's article appeared in 1970 in the New York Times: [www.nytimes.com/1970/09/13/archives/a-friedman-doctrine-the-social-responsibility-of-business-is-to.html](http://www.nytimes.com/1970/09/13/archives/a-friedman-doctrine-the-social-responsibility-of-business-is-to.html)

motivations for banking CSR engagement: a strategic choice, a voluntary/altruistic choice, or “green washing”. By using a dataset of 162 banks in 22 countries, they show that CSR is positively associated with the ROA, ROE, net interest income and non-interest income. Moreover, they find a negative relationship between CSR and non-performing loans. They also argue that the leading motivation of engagement is the “strategic choice”.

More recently, [Meng-Wen et al. \(2017\)](#) propose a novel multi-level matching approach and find a positive relationship between (multi-degree) CSR and banks’ financial performance. [Jizi et al. \(2014\)](#) analyze the impact of corporate governance on the US banking industry in the period 2009–2011, finding a positive association between boards’ size and independence and the CSR disclosure index. Also, [Cornett et al. \(2016\)](#) stress a positive link between CSR and performance for US banks during the period 2003–2013, underlining a positive link between size and CSR disclosures and, after the financial crisis, an increase in CSR engagement.

Apparently, limited evidence contrasts the positive association between CSR and performance in banking; a negative effect is found by [Climent \(2018\)](#), by comparing one ethical (Triodos Bank) and one conventional bank (Banco Santander) in the period 2012–2015.

Finally, a relatively recent stream of research focuses on developing markets and provides interesting but mixed findings that are related to this paper’s aims. [Fijalkowska et al. \(2018\)](#) investigate the relationship between corporate financial performance and CSR of banks in Central and Eastern Europe over the period 2012–2016, with three main findings: (1) being socially responsible is not reflected in banks’ net earnings, net profit, net income or earnings per share; (2) the financial condition of banks does not affect the CSR engagement; (3) the higher the financial efficiency, the greater the efficiency of CSR activities. [Maqbool and Zameer \(2018\)](#), by focusing on 28 listed Indian commercial banks, and [Fayad et al. \(2017\)](#) for a few Lebanese banking institutions confirm a positive relationship between CSR and performance.

### 2.3. CSR in Islamic finance

In recent years, CSR is increasingly investigated also in the context of Islamic financial services, where it represents a relatively rich and growing stream if compared to others in this context.

We identify five main research streams in this area: 1) the sensitivity of CSR engagement to the Islamic finance founding principles; 2) the role played by the Sharia supervisory board; 3) comparative studies between Islamic and conventional banks; 4) stakeholders’ perception of CSR disclosures; 5) socially responsible investments (SRI) in Islamic finance.

The first research stream is built around the expectation that, due to its founding principles, Islamic finance is naturally fostering sustainability through social responsibility. [Basah and Yusuf \(2013\)](#) provide a literature review on CSR in Islamic banking, suggesting more proactive CSR policies for these institutions. The positive link between CSR and performance in Islamic banks is found by [Khan \(2016\)](#) for the Meezan bank of Pakistan and [Islam et al. \(2012\)](#) for banks in Bangladesh.

On the role of the Sharia supervisory board, several studies support its significant contribution to CSR. [Aribi and Gao \(2011\)](#) perform a content analysis on 21 Islamic institutions in the GCC region, supporting the pivotal role to the Sharia supervisory board. Also [Quttainah and Almutairi’s \(2017\)](#), adopting a managerial perspective, provide evidence of a linkage between Sharia supervisory boards and corporate ethics as a channel that mitigates agency issues. A broader perspective associated with the role played by the Sharia supervisory board in linking CSR and performance is found in [Mallin et al. \(2014\)](#), that explore the relationship between CSR and performance in Islamic banks in the period 2010–2011 for a sample of 90 institutions across 13 countries.

However, this hypothesis is not always supported empirically. A direct link between social responsibility and religion is posited by [Williams and Zinkin \(2010\)](#), but no evidence is found on an impact of religious principles on the implementation of the UN Global Compact. Moreover, some scholars argue that CSR is only a peripheral activity for the Islamic banking sector ([Sairally, 2013](#)).

A prominent research stream investigates Islamic institutions in a comparative framework with their conventional counterparts. [Nobanee and Ellili \(2015\)](#) underline a low level of CSR disclosures for listed UAE banks in the period 2003–2013 and, at the same time, find a more positive impact of sustainability practices in conventional banks, rather than in Islamic banks. [Hayat and Hassan \(2017\)](#), after distinguishing Islamic and non-Islamic S&P 500 firms, conclude that an Islamic label is associated with a slightly higher governance quality.

The importance of stakeholder’s perception of CSR disclosures is another closely linked research topic for Islamic banks. [Jaiyeoba et al. \(2018\)](#), using data collected from stakeholders in Malaysia, show a positive effectiveness of CSR practices in Islamic institutions. [Haniffa and Hudaib \(2007\)](#) explore if any discrepancy exists between the information disclosed in annual reports and the Ethical Identity index: they find a strong divergence between ideal and material identity of banks, highlighting a divergence between religious principles and operations. [Farook et al. \(2011\)](#) investigate the macroeconomic and firm-specific determinants of social oriented activities of 47 Sharia-compliant banks in 14 countries, documenting a link between the “influence of the relevant public”, the “Sharia corporate governance” and firms’ CSR.

More recently, SRI practices emerged as a promising research field also for Islamic finance. [Abdelsalam et al. \(2014\)](#) focus Islamic funds and perform a partial frontier analysis and quantile regressions, concluding that SRI are significant for less efficient Islamic funds but the same evidence lacks for mutual funds. [Charfeddine et al. \(2016\)](#) compare the performance of SRI within Islamic and conventional investments, concluding that the ethical screening has a negative impact on performance when compared to an “un-ethical” benchmark. However, their cointegration tests show a long-run relationship between SRI and Islamic investments only for FTSE indexes. [Erragraguy and Revelli \(2016\)](#) test the integration of ESG factors in an Islamic portfolio, in order to determine the effects of a simultaneous compliance to both sets of principles in the period 2007–2011. They find, for Sharia-compliant stocks, a positive association between stock returns and ESG screening and a negative relationship with the SRI strategy of disengagement.

**Table 1**

Sampled countries and relative weight. This table shows the weight of institutions in our sample by country, in alphabetical country code order, based on their total number.

Country Code	Country	Percent
AE	United Arab Emirates	0.8
AU	Australia	0.6
CN	China	0.6
DE	Germany	14.3
DK	Denmark	4.9
EG	Egypt	2.2
ES	Spain	10.1
FR	France	37.5
GH	Ghana	1.6
GR	Greece	0.6
HK	Hong Kong	9.3
IE	Ireland	0.6
LU	Luxemburg	0.8
NL	Netherlands	0.6
UK	United Kingdom	13.2
US	USA	2.5
Total		100

Focusing on stock indexes, [Paltrinieri et al. \(2018\)](#) argue that there is cointegration between Islamic and SRI indexes, other than co-movements with mutual causalities. Dynamic correlations tend to spike during crises (i.e. lower portfolio diversification opportunities), but different patterns emerge afterwards when there is more variability in conditional covariances. Finally, [BinMahfouz and Hassan \(2017\)](#) examine four groups of investment portfolios, showing insignificant performance differences between Islamic and conventional sustainability indexes under different screening criteria.

Despite the amount of contributions on CSR, extending to banking and to Islamic finance, the literature is still offering unclear evidence. This paper contributes to the ongoing discussion by exploring an alternative setting where, in a cross-country sample of banks, we focus on the relationship between the development of each country's Islamic finance and banks' ESG scores.

### 3. Data and methodology

#### 3.1. The sample

We draw on a unique cross-country dataset, an unbalanced panel of annual data for 224 banks from sixteen countries, covering the period 2014–2017. The criteria for composing this sample and its dimensions (banks, countries, years) are only determined by the availability of IFDI and ESG scores and by the necessity to obtain a dataset that avoids excessive concentration on too few entities or countries, or too many missing observations. For this reason, our final sample includes all banks with an ESG rating that are in a country with an IFDI index, but we limited our sample period to 2014–2017. The countries included in the dataset and their weight are reported in [Table 1](#).

We use three data sources to build our dataset: bank-level data are from S&P Global Market Intelligence, ESG scores are from MSCI (ESG IVA index) and the IFDI index is computed by ICD Thomson Reuters, as discussed below in further detail.

Our approach distinguishes this paper from existing literature by not focusing on a comparative framework (Islamic versus non-Islamic) or specific Islamic countries. Nonetheless, a comparative intent is still present in the aims of this paper but relies only on the stage of Islamic finance development.

#### 3.2. Main variables

Three sets of variables are used in our empirical analysis.

The dependent variable is the ESG total or partial score (Environmental, Social, Governance), whereas the target variable is a measure of Islamic finance development (IFDI rating). Finally, bank-specific control variables are employed, along with country and year fixed effects.

[Table 2](#) provides details on defining our variables, whereas more insight on the ESG seven-point rating scale is shown in [Table 3](#).

The IVA rating is designed to differentiate companies' positioning on medium- to long-term risks. Moreover, the measure accounts for sectoral differences by adopting individual weights on risk drivers that are industry specific. Finally, the final measure is designed to account for how well firms manage their exposure to risk factors by a peer-based comparison.

Consistently with our research questions, we provide analysis on the overall ESG score and on its decomposition: we aim at assessing whether and to what extent the Islamic finance development of a country impacts different CSR metrics.

The design of ESG scores requires weighting and combining several variables. The ENV pillar entails thirteen key drivers, which are grouped in four buckets (Climate change, Natural Capital, Pollution&Waste and Environmental opportunities). The SOC pillar considers fourteen key issues referred to Human Capital, Product Liability, Stakeholder opposition and Social opportunities. Finally,

**Table 2**

Variables Definition. This table presents the data source and definition of our dependent, independent and control variables.

Variable	Definition	Source
<i>Dependent Variables</i>		
ESG	ESG index	MSCI
ENV	First component of the ESG Index. Environmental pillar	MSCI
SOC	Second component of the ESG Index. Social pillar	MSCI
GOV	Third component of the ESG Index. Governance pillar	MSCI
<i>Independent Variables</i>		
IFDI	The Islamic Finance Development Indicator measures the industry's development by combining data of its different elements into a singular composite Indicator.	ICD Thomson Reuters
QDI	Fist fundamental of the IFDI Index. Quantitative Development Indicator	ICD Thomson Reuters
GI	Second fundamental of the IFDI Index. Governance Indicator	ICD Thomson Reuters
CSR	Third fundamental of the IFDI Index. CSR Indicator	ICD Thomson Reuters
AI	Fourth fundamental of the IFDI Index. Awareness Indicator	ICD Thomson Reuters
KI	Fifth fundamental of the IFDI Index. Knowledge Indicator	ICD Thomson Reuters
<i>Control Variables</i>		
TA	Total assets in millions of Euros	S&P Global Market Intelligence
EQUITY/TA	(Total equity capital/Total Assets) x 100%	S&P Global Market Intelligence
LOAN/DEP	(Total loans and leases (net of unearned income and gross of reserves)/Total Deposits (including domestic and foreign deposits)) x 100%	S&P Global Market Intelligence
CI	Cost income ratio: (Operating expenses/Operating income) x 100%	S&P Global Market Intelligence
LLP/NPL	(Loan loss provisions/Non-performing loans) x 100%	S&P Global Market Intelligence

**Table 3**

MSCI IVA ESG Rating. This table presents the qualitative description of MSCI IVA ESG rating.

AAA	A company with minimal, well-identified environmental/social risks and liabilities, and with a strong ability to meet any losses, which might materialize. Extremely well-positioned to handle any foreseeable tightening of regulatory requirements, and strongly positioned strategically to capitalize on environmentally/socially-driven profit opportunities.
AA	A company with environmental/social risks and liabilities, which have been well-identified and provided for. This position is unlikely to be impaired by any foreseeable tightening of regulatory requirements. The company is well-positioned strategically to capitalize on environmentally/socially-driven profit opportunities.
A	A company with large but well-identified environmental/social risks and liabilities, and sufficient financial and managerial strength to absorb all but exceptional risks. Able, also, to finance any currently proposed regulatory requirements. Above- average positioning with respect to profit opportunities.
BBB	A company with strong managerial capability, but one where environmental/social risks and liabilities are a potential source of loss, though not on any material scale. Average level of positioning vis a vis profit opportunities.
BB	A company with good managerial capability, but one where environmental/social risks and liabilities are a potential source of material loss. Below-average level of strategic positioning.
B	A company whose environmental/social risks and liabilities create a strong likelihood of material losses in both profitability and competitive position. Significantly below-average strategic positioning.
CCC	A company where there are significant doubts about management's ability to handle its environmental/social risks and liabilities, and where these are likely to create a serious loss. Well below-average ability to capitalize on environmentally/socially-driven profit opportunities.

the GOV pillar (GOV) combines eight items regarding both corporate governance and corporate behavior<sup>2</sup>.

To measure Islamic finance development, we use the ICD Thomson Reuters IFDI at the country-level. The index spans from 0 to 100 and is computed using publicly available information for both OIC and non-OIC Countries. It is a particularly recent and extensive composite indicator, derived from five fundamental variables. A description of its contents is provided in Table 4.

The first dimension considered is the *Quantitative Development*, assessed by looking at five key sectors of the industry: Islamic Banking, Takaful, Other IFIs (Investment companies, micro-finance institution, etc.), Sukuk and Islamic Funds. The framework weighs their size, growth and expansion, market performance and financial soundness (asset quality, earnings and efficiency). Remarkably, the item Islamic Banking captures the size of all banks in each country that are considered Sharia-compliant, therefore including both fully-fledged Islamic financial institutions and windows.

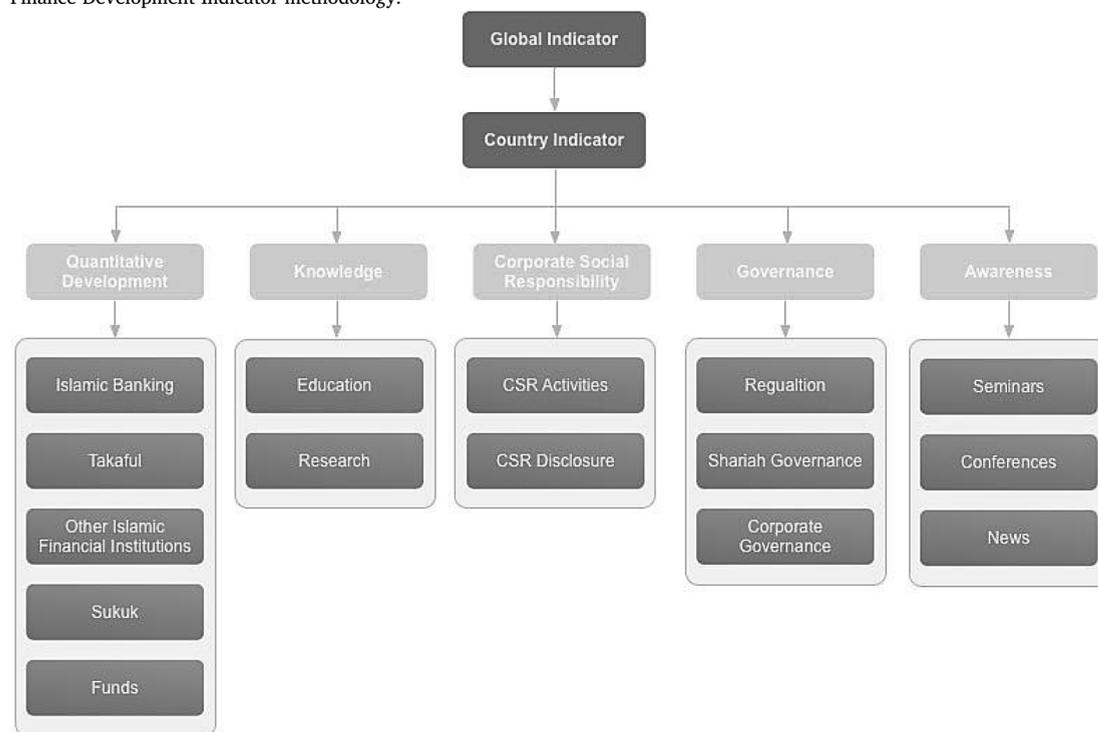
The second dimension of the IFDI, *Knowledge*, is assessed by reviewing the number of training and educational courses available in each country, as well as the amount of related research produced.

*Corporate Social Responsibility* is measured by combining two proxies. The first one is an index based on the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) Governance Standard No. 7, which detects all CSR activities disclosed by participating institutions. The second is the relative value of the contribution to charity in the form of *Zakat* (compulsory

<sup>2</sup> See MSCI Executive Summary for further details. [https://www.msci.com/documents/10199/242721/IVA\\_Methodology\\_SUMMARY.pdf](https://www.msci.com/documents/10199/242721/IVA_Methodology_SUMMARY.pdf)

**Table 4**

IFDI composition. This table provides the summary of the IFDI components and related sub-indexes as provided by ICD Thomson Reuters Islamic Finance Development Indicator methodology.



contributions) and *Qard Hasan* (interest-free loans).

Despite the CSR component of the IFDI may seemingly overlap to some extent with our dependent variable (ESG scores), we are not concerned by this potential bias due to the more specific and precise base of the IFDI for the Islamic finance sector, as highlighted in the variables breakdown.

The IFDI includes also the fundamental *Governance* that accounts for features such as the presence of a specific regulation covering a country's financial services or a national-level Sharia committee<sup>3</sup>.

A limited public understanding of Islamic finance in one country may undermine its development, growth and penetration. Interestingly, the *Awareness* dimension is included in the IFDI, proxied by the number of Islamic finance "events" recorded in each country and the number of Islamic finance news written in English in that country.

The distribution of the IFDI across countries in our sample is presented in Table 5.

Lastly, we employ a set of bank-level control variables that is well established in the extant literature (see e.g. Meng-Wen and Chung-Hua, 2013), covering banks' size, capitalization, business model, cost efficiency and credit quality (also described in Table 2).

### 3.3. Methodology

In order to provide empirical support to our research questions, we perform a multivariate analysis. Different specifications of linear regression models, as exemplified in Eq. (1), are employed in order to determine the impact of the IFDI on the ESG score of banks included in our sample.

$$ESG\ measure_{ijt} = \alpha_{ijt} + \beta_1 IFDI_{jt} + \beta_2 BankControls_{ijt} + \gamma_j + \delta_t + e_{ijt} \quad (1)$$

where subscripts  $i$ ,  $j$  and  $t$  denote the  $i$ -th bank in country  $j$  at time  $t$ ,  $\gamma_j$  and  $\delta_t$  represent, respectively, country and year fixed effects. *ESG measure* denotes either the overall ESG score, or each of its pillars (ENV, SOC, GOV), whereas *IFDI* indicates either the IFDI score or its sub-index, depending on the model specification. The vector *BankControls* is self-explanatory. Table 6 presents the correlation matrix between independent variables.

We include country and year fixed effects in all model specifications to control for omitted variables at the country level and for macroeconomic conditions. The standard errors are clustered at the bank level.

The baseline model (see Table 7) regresses the IFDI against the banks' ESG scores and its three pillars, controlling for bank-specific

<sup>3</sup> See Islamic Finance Development Indicator Rulebook for further details: <https://www.zawya.com/islamic-finance-development-indicator/files/IFDI-Rulebook.pdf?v2>

**Table 5**

IFDI distribution by Country. This table provides a summary of the mean, standard deviation, minimum and maximum values by country of the IFDI over the sample period (2014-17).

Country	Mean	Std. Dev.	Min	Max
United Arab Emirates	65.66	1.29	64.17	66.47
Australia	6.48	1.77	5.23	7.73
China	0.02	0.00	0.02	0.02
Germany	0.16	0.10	0.00	0.26
Denmark	0.35	0.29	0.09	0.70
Egypt	18.19	2.47	14.48	20.43
Spain	0.41	0.13	0.22	0.50
France	0.64	0.39	0.30	1.26
Ghana	2.63	0.58	1.90	3.15
Greece	0.30	0.00	0.30	0.30
Hong Kong	1.82	1.14	0.67	3.44
Ireland	0.80	0.38	0.53	1.06
Luxembourg	5.82	2.81	2.57	7.46
Netherlands	0.37	0.16	0.25	0.48
United Kingdom	14.47	1.07	13.54	16.16
USA	1.86	0.83	1.13	3.21
Total	7.30	0.83	6.58	8.28

**Table 6**

Correlation Matrix. This table provides the correlation matrix of our dependent, independent and control variables, where ESG is the overall score, ENV/SOC/GOV its components, IFDI is the Islamic Finance Development Indicator, TA is the total assets in EUR millions, EQUITY/TA is the ratio between equity and total assets, LOAN/DEP is the loan to deposit ratio, CI is the cost-income ratio, and LLP/NPL is the non-performing loans coverage ratio. Significance codes: \*  $p < 0.05$ .

	ESG	ENV	SOC	GOV	IFDI	TA	EQUITY/TA	LOAN/DEP	CI
ENV	0.3487*	1							
SOC	0.6965*	0.3138*	1						
GOV	0.4120*	-0.3835*	-0.2129*	1					
IFDI	-0.0083	-0.2013*	-0.0560*	0.1361*	1				
TA	0.0008	0.0583*	-0.0441*	0.0091	0.0078	1			
EQUITY/TA	-0.0402	-0.0598*	-0.0493	0.0107	0.0425	-0.0099	1		
LOAN/DEP	-0.003	0.017	0.0157	-0.0288	-0.0074	0.0043	0.0332*	1	
CI	0.0565*	0.1050*	0.0919*	-0.0608*	-0.1529*	-0.0965*	0.0343*	-0.0015	1
LLP/NPL	0.0162	-0.0886*	-0.0339	0.0881*	0.1102*	-0.0248*	0.0391*	-0.0321*	-0.2185*

**Table 7**

ESG and Islamic finance development: baseline and lagged models. This table shows the results of the baseline and lagged OLS regression analysis on the overall score (ESG) and its components (ENV, SOC, GOV). Independent variables are the Islamic Finance Development Indicator (IFDI), size (TA, total assets in EUR millions), the equity over total assets ratio (EQUITY/TA), the loan over deposit ratio (LOAN/DEP), the cost-income ratio (CI), the ratio between loan loss provisions on non-performing loans (LLP/NPL). Standard errors in parenthesis are clustered at the bank level. Significance codes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

	A: Baseline				B: Lagged			
	ESG (1a)	ENV (2a)	SOC (3a)	GOV (4a)	ESG (1b)	ENV (2b)	SOC (3b)	GOV (4b)
IFDI	0.034* (0.020)	0.022 (0.051)	0.081*** (0.025)	-0.068 (0.049)	0.068*** (0.023)	-0.081 (0.073)	0.132*** (0.027)	-0.032 (0.058)
TA	-.0001*** (.0001)	0.001*** (.0001)	-.0001** (.0001)	-0.001*** (.0001)	-.0001*** (.0001)	0.001** (.0001)	-.0001** (.0001)	-0.001** (.0001)
EQUITY/TA	0.003 (0.013)	-0.035 (0.033)	-0.002 (0.015)	0.017 (0.036)	0.005 (0.016)	-0.081* (0.047)	-0.017 (0.018)	0.058 (0.050)
LOAN/DEP	-0.211 (0.210)	0.341 (0.404)	-0.335 (0.288)	-0.478 (0.436)	-0.149 (0.254)	0.132 (0.540)	-0.186 (0.310)	-0.268 (0.592)
CI	-0.000 (0.002)	-0.001 (0.009)	-0.002 (0.003)	0.005 (0.005)	-0.000 (0.002)	0.007 (0.011)	-0.004 (0.004)	0.005 (0.007)
LLP/NPL	-0.001 (0.001)	-0.001 (0.002)	-0.003** (0.001)	0.001 (0.002)	-0.002 (0.001)	-0.002 (0.003)	-0.004** (0.002)	0.002 (0.004)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	794	794	794	794	365	365	365	365
R <sup>2</sup>	0.191	0.379	0.410	0.330	0.220	0.361	0.482	0.328

variables, country- and year fixed-effects. We use the RESET test for omitted variables and model misspecification to test its goodness, and the variance inflation factor (VIF) to check for multicollinearity. Finally, to address reverse causality concerns, we exploit the dynamic nature of our panel by lagging all explanatory variables by one year (Table 7, columns 1b-4b) and we measure the Granger causality link between the IFDI and the ESG score.

Due to the different development stage of Islamic finance in each of the sampled countries, we also test potential non-linear relationships between the IFDI and the ESG score. We expect that a small or high level of development, in the sense captured by our target variable, can explain gains in the ESG score at different paces. Therefore, we include a test for a potential decreasing impact as exemplified in the following Eq. 2, where the square of the IFDI score is included.

$$ESG\ score_{ijt} = \alpha_{ijt} + \beta_1 IFDI_{jt} + \beta_2 IFDI_{jt}^2 + \beta_3 BankControls_{ijt} + \gamma_j + \delta_t + e_{ijt} \quad (2)$$

With a similar rationale and contingent on the results of the previous analysis, we also carry a test to identify if a structural break exists in how the IFDI relates to ESG scores. In other words, we are interested in finding the level of development after which the impact on sustainability indicators is negligible (or negative). Our methodology is consistent with Wooldridge, 2015 (pp. 192–194).

We also test the impact of a one standard deviation change of IFDI on ESG scores, for both the baseline and lagged models, as well as for small and large institutions.

A potential additional effect to be considered is linked to the variability of banks' size across our sample. For this reason, we check the robustness of our results by dividing our sample in two groups (small and large), with the threshold set at the sample median value, and running our baseline model on each sub-sample. An additional bias to be considered is joined to the large presence of French banks in our sample. In order to overcome this possible bias, we tested our results by excluding the French sub-sample. As a final robustness check on endogeneity issues, we conclude our analysis by applying a two-step GMM regression on the same (lagged) variables.

#### 4. Results and discussion

Table 7 shows the result of the baseline model: a regression analysis between the total ESG score and its components (ENV, SOC, GOV) and the IFDI. Results include both the baseline and lagged models, addressing both robustness and reverse causality concerns.

The baseline model shows a positive relationship for the aggregated ESG score. Moreover, this result is strongly driven by the social pillar. This finding may be due to the sensitivity of Islamic finance institutions to the social dimension of their activity, especially towards employment quality, health, safety, training, diversity and human rights indicators in the SOC pillar. At the same time the IFDI is not statistically significant for GOV and ENV factors.

The only relationship that holds across the four regressions is represented by size (TA). However, despite a modest magnitude of the related coefficients, the relationship is negative at the aggregated level and within the social and governance pillars, yet positive considering environmental factors. Finally, in line with previous findings (e.g. Meng-Wen and Chung-Hua, 2013), in the case of the social pillar, we find a significant and negative relationship with the ratio between loan loss provisions and non-performing loans (LLP/NPL). We interpret these results as follows.

The negative relationship with size seems in contrast with existing literature, but we consider plausible that when financial institutions are considered *per se* (i.e. without measuring environmental or social impact of their assets), an increase in size may reduce the ability to pursue goals that positively affect the social pillar. Larger institutions may, in this interpretation, increase their (perceived or actual) distance from their reference community, or exhibit a larger public involvement in workforce controversies (the largest two components of the social pillar). At the same time, larger institutions may incur more difficulties in maintaining an effective management of a more complex corporate structure. Nevertheless, a positive relationship between size and the environmental score is found and reasonably links with a greater stakeholders' demand and firms' response to this sustainability factor. This result is tested furtherly later, when we aim at measuring the presence of non-linear relationships between size and ESG scores.

The negative relationship between the LLP/NPL ratio and the Social pillar should also be interpreted with caution. An intuitive explanation could consider that the need to increase provisions may drain resources from ESG sensitive activities. However, the same ratio grows also if NPL decrease: this seems inconsistent with the previous interpretation. Moreover, regulatory and risk management practices vary widely across countries and the data available does not allow to further analyze credit risks in detail. Specifically, we are not able to measure the actual exposure to credit risk, in terms of risk-based capital or earnings absorbed. One can also argue that the same amount of NPL may reasonably imply different desirable levels of LLP: the expected recoverability is directly influenced by, for instance, the quality and quantity of guarantees assisting each exposure. Despite the intuitive explanation is not rejected (high levels of NPL requiring higher LLP absorb resources and impact ESG scores indirectly), an additional effect might be in place. We tentatively argue that a low level of NPL may be the result of a more restrictive selection of borrowers, potentially leading to a lower level of service to clients. Unfortunately, we are unable to test this hypothesis.

To provide a potential indication of a causal relationship, we add to the same table a symmetrical analysis that adopts lagged explanatory variables. Previous results are fully confirmed, and we also obtain a material increase in significance for the role played by the IFDI on ESG scores: again, this finding holds only for the social pillar.

The only additional result arising from this analysis is that the equity ratio obtains a modest significance and shows a negative association with the environmental score. We tentatively interpret this result by assuming that an increase in the equity ratio, whether this is a result of more stringent regulation or an increase in bank risk, requires a response in terms of shareholders' compensation and may increase the focus on short-term performance rather than long-term environmental sustainability.

**Table 8**

Decomposition of the Islamic Finance Development Indicator. This table shows the results of the OLS lagged regression analysis on the relationship between the ESG and its components (ENV, SOC, GOV), the five components of the IFDI, namely the quantitative development indicator (QDI), knowledge indicator (KI), awareness indicator (AI), CSR, governance indicator (GI), as well as bank-specific variables: size in million EUR (TA), the equity over total assets ratio (EQUITY/TA), the loan over deposit ratio (LOAN/DEP), the cost-income ratio (CI), the ratio between loan loss provisions and non-performing loans (LLP/NPL). Standard errors clustered at the bank level are in parenthesis. Significance codes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

	ESG (1)	ENV (2)	SOC (3)	GOV (4)	ESG (5)
QDI-1	0.032** (0.016)	-0.064 (0.047)	0.059*** (0.019)	-0.018 (0.030)	0,037*** (0014)
KI-1	0.017 (0.020)	0.044 (0.056)	0.008 (0.028)	0.049 (0.054)	
AI-1	0.004 (0.010)	-0.037 (0.026)	0.018 (0.012)	-0.022 (0.017)	
CSR-1	0.013 (0.010)	0.011 (0.033)	0.032** (0.013)	-0.028 (0.026)	
GI-1	-0.000 (0.010)	-0.023 (0.035)	0.013 (0.016)	-0.004 (0.029)	
KI&AI-1					0,009** (0005)
CSR&GI-1					0,003 (0006)
TA-1	-.0001*** (.0001)	0.001* (.0001)	-.0001*** (.0001)	-0.001** (.0001)	.0001*** (.0001)
EQUITY/TA-1	0.006 (0.016)	-0.081* (0.048)	-0.016 (0.018)	0.057 (0.050)	0005 (0016)
LOAN/DEP-1	-0.128 (0.257)	0.061 (0.546)	-0.144 (0.315)	-0.287 (0.601)	-0,120 (0257)
CI-1	-0.000 (0.003)	0.006 (0.012)	-0.004 (0.004)	0.005 (0.007)	-0,000 (0002)
LLP/NPL-1	-0.002 (0.001)	-0.002 (0.003)	-0.004** (0.002)	0.002 (0.004)	-0,002 (0001)
Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
R2	0.228	0.366	0.486	0.330	0.226
Obs.	365	365	365	365	365

Due to the heterogeneity of sampled countries, we additionally replicate the lagged model on two subsets, focusing only on Islamic countries (i.e. UAE and Egypt) and omitting the country with the largest share in our database (i.e. France, [Table 11](#)). Our main results hold. For Islamic countries only our results are even strengthened in terms of statistical significance, whereas we lose significance only for the total ESG score when we exclude France. The analyses related to UAE and Egypt sub-sample have not been included in this paper to save space but are available upon request.

Consistently with [Ferrell et al. \(2016\)](#) and [Becchetti et al. \(2015\)](#), if we consider as a reference the IFDI coefficient in our baseline and lagged regressions, one standard deviation change of IFDI produces a 2.8% ( $0.83 \times 0.034$ ) change in the ESG score, growing to 5.64% for the lagged model. Similarly, an increase of one standard deviation of IFDI produces an increase of 6.7% of the SOC score, increasing to 11% in the lagged model.

The positive association between the IFDI and ESG scores, in particular for the social pillar, could be furtherly broken down considering IFDI components to provide further insight on this phenomenon. Therefore, we investigate the relationship between the current and lagged ESG, the IFDI components and the usual bank-specific controls. Results are provided in [Table 8](#).

We find a significant positive effect only for the quantitative development indicator and, once again, such effect targets the social pillar. We argue that, at its current stage of progress, Islamic finance is mainly driven by its significant achievements in terms of growth, outperforming other relevant dimensions when the impact on sustainability is targeted. In other words, by consolidating their extension and ability to fulfil financial needs of reference communities, Islamic institutions appear more likely to carry benefits of their specific business and ethical models especially within the social dimension of ESG scores.

Only size, among the remaining covariates, shows a (strong) statistical significance: its coefficients are negative in most specifications, with an interpretation similar to the one we provided earlier. This finding also supports the earlier lack of significance towards the environmental and governance pillars of the IFDI.

In the last specification (Column 5), we aggregate the (apparently) insignificant IFDI components, again considering also current and lagged variables, in order to focus on the combination between awareness and knowledge.

This allows us to obtain an additional significant finding: awareness and knowledge combined are an additional positive and relevant factor in driving ESG scores. This result is consistent with previous ones on the social pillar, as well as with the theoretical approach discussed in [Ahmed et al. \(2015\)](#): Islamic finance seems mainly driven by supply-side efforts and constraints to its expansion, whereas sustainability objectives seem more grounded on the demand-side. On one hand, it reinforces the expected role

**Table 9**

ESG, IFDI and sample decomposition by scores. Shows the result of the OLS lagged regression analysis of the relationship between the ESG and its components (ENV, SOC, GOV), the Islamic Finance Development Index (IFDI), size in EUR millions (TA), the equity over total assets ratio (EQUITY/TA), the ratio between loans and deposits (LOAN/DEP), the cost-income ratio (CI), the ratio between loan loss provisions and non-performing loans (LLP/NPL). As dependent variable, we split our sample based on the banks' median size. Standard errors clustered at the bank level are in parenthesis. Significance codes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

	ESG		ENV		SOC		GOV	
	Large	Small	Large	Small	Large	Small	Large	Small
IFDI -1	0.028 (0.027)	0.083** (0.039)	-0.080 (0.098)	-0.111 (0.122)	0.107** (0.042)	0.192*** (0.036)	-0.167 (0.106)	-0.065 (0.093)
TA -1	-0.001** (0.000)	0.162 (0.538)	0.001* (0.000)	2.280* (1.305)	-0.001 (0.000)	-0.386 (0.406)	-0.001* (0.001)	-0.404 (1.372)
EQUITY/TA -1	0.018 (0.019)	-0.024 (0.025)	-0.070 (0.053)	-0.075 (0.079)	-0.009 (0.026)	-0.042* (0.024)	0.091* (0.048)	-0.006 (0.089)
LOAN/DEP -1	0.090 (0.413)	-0.323 (0.324)	-0.849 (0.816)	1.491* (0.767)	0.398 (0.615)	-0.845*** (0.290)	-0.052 (0.775)	-0.388 (0.884)
CI -1	-0.002 (0.005)	-0.000 (0.003)	-0.015 (0.014)	0.019 (0.013)	0.000 (0.007)	-0.005 (0.004)	-0.001 (0.010)	0.002 (0.009)
LLP/NPL -1	-0.004 (0.002)	-0.002 (0.002)	0.002 (0.004)	0.002 (0.005)	-0.007** (0.003)	-0.003 (0.002)	-0.001 (0.004)	-0.002 (0.005)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	198	163	198	163	198	163	198	163
R <sup>2</sup>	0.204	0.319	0.408	0.394	0.490	0.601	0.451	0.289

played within the reference community by Islamic finance institutions. Additionally, only by combining Islamic finance knowledge and awareness together there is a significant (positive) impact on our dependent variable.

Table 9 refines our results by splitting our sample at the median value of the total assets of the banks in our sample. The purpose is to furtherly analyze the effect of size that was earlier associated with mixed results.

Findings are in line with the baseline model and indicate a significant positive association with the IFDI for small banks. More precisely, an increase of one standard deviation of the IFDI increases the ESG score and the SOC score, respectively, by 6.8% and 15.7% for small banks. However, the IFDI produce effects also for large banks: a change of one standard deviation of the IFDI produces a change of 8.3% on the SOC score of large banks.

Despite differences across banks' sizes, this breakdown underlines again the prominent relevance of the social pillar in association with the IFDI for all corporate dimensions, as found and tentatively explained in our initial analysis.

Once more, environmental and governance scores do not seem to be related with the IFDI, neither for small, nor for large financial institutions. Additionally, this specification supports our previous conclusions on the negative association with the LLP/NPL ratio within the social pillar, by suggesting that such relationship is mainly driven by larger institutions.

Finally, we find that the association with the equity ratio is weakly significant only for small banks, where the coefficient is negative, and for large banks, where the relationship is positive. The statistical significance of these results remains weak and suggests care in deriving interpretations.

In Table 10 we furtherly refine our analysis by decomposing our sample on the basis of the IFDI score, considering countries in the first and fourth quartile of the distribution in columns 1 and 2, respectively. In this case we are interested in analyzing possible differences between markets at distant stages of development of Islamic finance, especially if those are associated with non-linearity or structural breaks.

We find that size maintains its negative and significant relationship across all specifications. Moreover, the relationship between ESG and IFDI is strongly significant and positive only for the low-IFDI subsample, where we also confirm a weakly significant and negative association with the LLP/NPL ratio. These two results disappear for high IFDI scores.

We do not find a strong evidence of a structural break between the ESG and the IFDI (squared IFDI). However, we could still be in a situation where non-linearity is represented by gains in ESG scores present up to a certain IFDI score, as it seems by looking at high-IFDI countries.

To further investigate this intuition, we assess where the turning point is placed. We find that the maximum level of IFDI that is beneficial for banks' ESG scores is 25%: considering that its mean value in our sample is 7.3%, this suggests that there is significant room for developing Islamic finance and simultaneously obtain positive effects on banks' ESG scores.

In order to furtherly check the robustness of our results, we test our baseline model by excluding French banks, representing alone 37.5% of our sample and potentially biasing our findings (Table 11). The results hold also for this subsample, confirming the positive relationship between the IFDI and the SOC score.

Our main result, however, strongly relies on the effective causality between variable. Therefore, as an additional test, we assess the existence of a unidirectional or bidirectional relationship between the IFDI and SOC through a Granger Causality Wald test (Table 12). In order to overcome a potential sensitivity of the test to the number of selected lags, we perform a Vector Autoregressive Model (VAR) and select the lowest value of the Akaike Information Criteria. The result points at three lags as the relevant choice. The

**Table 10**

ESG, IFDI, sample decomposition by IFDI and non-linearity. This table shows the results of the OLS regression analysis on the relationship between the ESG, the lagged IFDI and the following lagged firm-specific variables: size in EUR millions (TA), the equity over total assets ratio (EQUITY/TA), the ratio between loans and deposits (LOAN/DEP), the cost-income ratio (CI), the ratio between loan loss provisions on non-performing loans (LLP/NPL). Three different settings are investigated: low and high IFDI countries are separated and results are shown in columns 1 and 2, respectively; column 3 examines a non-linear effect of IFDI on the whole sample. Standard errors clustered at the bank level are in parenthesis. Significance codes: \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

	(1) ESG Low IFDI	(2) ESG High IFDI	(3) ESG Non-linear IFDI
IFDI -1	1.779*** (0.531)	0.015 (0.030)	0.105* (0.054)
IFDI (^2) -1			-0.002 (0.002)
TA -1	-0.004** (0.002)	-0.001*** (0.000)	-0.001*** (0.000)
EQUITY/TA -1	-0.006 (0.020)	-0.033 (0.047)	0.005 (0.016)
LOAN/DEP -1	-0.328 (0.396)	-0.086 (0.642)	-0.142 (0.255)
CI -1	-0.002 (0.003)	0.005 (0.006)	-0.000 (0.002)
LLP/NPL -1	-0.004* (0.002)	0.003 (0.003)	-0.002 (0.001)
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Obs.	120	84	365
R <sup>2</sup>	0.213	0.395	0.221

**Table 11**

ESG and Islamic finance development: subsample excluding French banks. This table shows the results of the robustness check on a subsample excluding French banks, based on a lagged OLS regression analysis on the overall score (ESG) and its components (ENV, SOC, GOV). Independent variables are the Islamic Finance Development Indicator (IFDI), size (TA, total assets in EUR millions), the equity over total assets ratio (EQUITY/TA), the loan over deposit ratio (LOAN/DEP), the cost-income ratio (CI), the ratio between loan loss provisions on non-performing loans (LLP/NPL). Standard errors in parenthesis are clustered at the bank level. Significance codes: \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

	ESG (No France)	ENV (No France)	SOC (No France)	GOV (No France)
IFDI-1	0.024 (0.022)	-0.059 (0.078)	0.088*** (0.034)	-0.079 (0.064)
TA-1	-0.001** (0.0001)	0.001* (.0001)	-0.0001** (.0001)	-0.001** (.0001)
EQUITY/TA -1	-0.015 (0.022)	-0.122* (0.064)	-0.029 (0.026)	0.039 (0.078)
LOAN/DEP -1	-0.322 (0.302)	0.001 (0.698)	-0.342 (0.352)	-0.423 (0.776)
CI -1	-0.001 (0.003)	0.013 (0.014)	-0.004 (0.005)	0.003 (0.009)
LLP/NPL -1	-0.002 (0.002)	-0.003 (0.005)	-0.005** (0.002)	0.005 (0.005)
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs.	228	228	228	228
R <sup>2</sup>	0.277	0.355	0.424	0.321

**Table 12**

Granger Causality test. This table show the results from the Granger Causality Wald test with 3 lags. IFDI is the Islamic Finance Development Indicator, whereas SOC is the social pillar of the ESG score. Significance codes: \*\* p < 0.05.

Null-hypothesis	Obs.	F-Statistic	Prob.
IFDI does not granger cause SOC	2,317	3.252	0.0209**
SOC does not granger cause IFDI	2,317	2.429	0.0635

causality test shows a unidirectional relationship, with IFDI Granger-causing SOC and not vice-versa. This finding corroborates our argument on the role played by Islamic finance development in achieving higher social sustainability across countries.

Finally, as a further robustness check, in the lack of a valid exogenous shock common to all sampled countries in the investigated period, we perform a two-step GMM to control for possible endogeneity concerns. The GMM controls for all sources of endogeneity

**Table 13**

Two-step GMM test. This table shows the results of the two-step GMM regression analysis on the relationship between the overall ESG score or the social pillar component (SOC), the lagged IFDI and the following lagged firm-specific variables: size in EUR millions (TA), the equity over total assets ratio (EQUITY/TA), the ratio between loans and deposits (LOAN/DEP), the cost-income ratio (CI), the ratio between loan loss provisions on non-performing loans (LLP/NPL). Ar1 and Ar2 show the *p-value* of the relative test of autocorrelation of first and second order, while the Hansen *p* test is the Hansen statistic.

	(1) ESG	(2) SOC
ESG-1	0.681*** (0.0189)	
SOC-1		0.782*** (0.0135)
IFDI-1	0.0039** (0.00155)	0.0043*** (0.00150)
TA-1	-.0001*** (.00001)	-.0001*** (.00001)
EQUITY/TA -1	0.0211*** (0.00463)	-0.00705 (0.00825)
LOAN/DEP -1	0.138 (0.100)	-0.630*** (0.0673)
CI-1	-0.006*** (0.0007)	-0.0077*** (0.00130)
LLP/NPL -1	-0.003*** (0.0004)	-0.0068*** (0.0006)
Ar1	.00	.00
Ar2	.64	.99
Hansen p	.396	.273
Observations	371	371
Number of ID	230	230

(unobserved heterogeneity, simultaneity, dynamic endogeneity; [Wintoki et al., 2012](#)) by including lagged dependent variable values (ESG) as additional covariates. Results are shown in [Table 13](#).

The output of the Arellano-Bond (AR1 and AR2) and Hansen tests allow us to show the correct specification of our model, without autocorrelation of second order and confirming the unbiased results of our baseline analysis. We limit this analysis to the overall ESG score and to the SOC pillar (due to previous findings) and confirm the relevance of IFDI for both metrics.

## 5. Conclusion

The impact of CSR on firms' performance and risk is widely investigated in the literature. Benefits of CSR have been empirically tested also in the banking sector and, quite extensively, also for Islamic finance. Especially for the latter findings are still mixed and research is limited by a focus on one country, heterogeneous sample periods and different proxies for both Islamic institutions and CSR.

We contribute to this gap in the literature by proposing a novel perspective that considers banks with a MSCI IVA ESG rating in countries included in the ICD-Thomson Reuters sample. This allows us to assess the relationship existing between the Islamic Finance Development Indicator (IFDI) and ESG scores over the period 2014–2017 for a sample of 224 banks from sixteen countries. To the best of our knowledge this is the first empirical paper that employs the IFDI and its rich informative content to analyze the relationship between Islamic finance and CSR.

Our research questions explore the link between Islamic finance development and sustainability within and outside the typical countries considered in related literature, which components of ESG scores and IFDI are stronger in explaining this relationship, and how large could be the gains in sustainability that could be achieved by further expansion of Islamic finance.

We address the first dimension through a multi-level analysis that looks at the issue with growing granularity. Firstly, we assess whether the IFDI affects ESG scores. Then, we decompose the latter into its three pillars (environmental, social and governance). Furthermore, we also decompose the IFDI into its five fundamentals. Finally, we posit a non-linear relationship, search for a structural break between IFDI and ESG scores and test the causality link between these two dimensions.

We find a positive and robust relationship between IFDI and ESG scores that is mainly found in the social dimension and driven by the quantitative contribution to Islamic finance growth. We also show that there is still significant room for achieving sustainability benefits by fostering Islamic finance development.

Our empirical findings strongly confirm the theoretical connection between Islamic finance and ESG factors, widely proposed also in practitioners' research (S&P Global 05/20/2019, Thomson Reuters Responsible Finance Report, 2015). As argued by the Principles for Responsible Investment (PRI, 7/13/2017), the main drivers of growth in OIC countries are the alignment of social objectives in responsible investments, Islamic finance, and the additional value of integrating ESG factors into investment processes, combined

with the Sharia screening. Unlike recent related research adopting a financial performance perspective (Erragraguy and Revelli, 2015 and 2016), we focus on the potential social positive externalities. Moreover, we give proof that the positive relationship is greater for small banks, despite the IFDI affects also bigger institutions within the ESG social pillar.

Our results have material policy implications. We are supportive of a significant contribution that Islamic finance, on a cross-country scale, may provide to achieve UN Sustainable Development Goals. We also support the need to promote growth by acting on the demand side, in particular awareness and knowledge of Islamic finance. Finally, the intuition that the approach to ethics of Islamic finance and the resulting business practices are a natural channel to promote social inclusion and development is confirmed by our empirical results.

## References

- Abdelsalam, O., Fethi, D.M., Matallin, J.C., Tortosa-Ausina, E., 2014. On the comparative performance of socially responsible and Islamic mutual funds. *J. Econ. Behav. Organ.* 103, s108–s128.
- Ahmed, H., Mohieldin, M., Verbeek, J., Aboulmagd, F.W., 2015. On the Sustainable Development Goals and the Role of Islamic Finance. World Bank, Policy Research Working Paper, pp. 7266.
- Aribi, Z.S., Gao, S.S., 2011. Narrative disclosure of corporate social responsibility in Islamic financial institutions. *Manag. Audit. J.* 27 (2), 199–222.
- Basah, M.Y.A., Yusuf, M.M., 2013. Islamic bank and CSR. *Islamic Management and Business.* 5 (11), 194–209.
- Beccchetti, L., Ciciretti, R., Hasan, I., 2015. Corporate social responsibility, stakeholder risk, and idiosyncratic volatility. *J. Corp. Financ.* 35, 297–309.
- BinMahfouz, S., Hassan, M.K., 2017. Sustainable and socially responsible investing: Does Islamic investing make a difference? *Humanomics* 29 (3), 164–186.
- Cai, Y., Jo, H., Pan, C., 2012. Doing well while doing bad? CSR in controversial industry sectors. *J. Bus. Ethics* 108 (4), 467–480.
- Cavaco, S., Crifo, P., 2014. CSR and financial performance: complementarity between environmental, social and business behaviours. *Appl. Econ.* 46 (27), 3323–3338.
- Charfeddine, L., Najah, A., Teulon, F., 2016. Socially responsible investing and Islamic fun: new perspective for portfolio allocation. *Res. Int. Bus. Financ.* 36, 351–361.
- Climent, F., 2018. Ethical versus conventional banking: a case study. *Sustainability* 10 (7), 2152.
- Cornett, M.M., Erhemjamts, O., Tehranian, H., 2016. Greed or good deeds: an examination of the relation between corporate social responsibility and the financial performance of U.S. Commercial banks around the financial crisis. *J. Bank. Financ.* 70, 137–159.
- Dowell, G., Hart, S., Yeung, B., 2000. Do Corporate Global Environmental Standards Create or Destroy Market Value? *Manage. Sci.* 46 (8), 1059–1074.
- Elkington, J., 1999. *Cannibals with Forks: the Triple Bottom Line of 21st Century Business.* Capstone, Oxford.
- Erragraguy, E., Revelli, C., 2015. Should Islamic investors consider SRI criteria in their investment strategies? *Financ. Res. Lett.* 14, 11–19.
- Erragraguy, E., Revelli, C., 2016. Is it costly to be both sharia compliant and socially responsible? *Rev. Financ. Econ.* 31, 64–74.
- Farook, S., Hassan, M.K., Lanis, R., 2011. Determinants of corporate social responsibility disclosure: the case of Islamic Banks. *J. Islam. Account. Bus. Res.* 2 (2), 114–141.
- Fayad, A.A., Ayoub, R., Ayoub, M., 2017. Causal relationship between CSR and FB in banks. *Arab. Econ. Bus. J.* 12 (2), 93–98.
- Ferrell, A., Liang, H., Renneboog, L., 2016. Socially responsible firms. *J. financ. econ.* 122 (3), 585–606.
- Fijalkowska, J., Zyznarska-Dworczak, B., Garszka, P., 2018. Corporate social-environmental performance versus financial performance of banks in central and eastern european countries. *Sustainability* 10 (3), 772.
- Haniffa, R., Hudaib, M., 2007. Exploring the ethical identity of Islamic banks via communication in annual reports. *J. Bus. Ethics* 76 (1), 97–116.
- Hayat, R., Hassan, M.K., 2017. Does an Islamic Label indicate good corporate governance? *J. Corp. Financ.* 43, 159–174.
- Hoje, J., Haejung, N., 2012. Does CSR reduce firm risk? Evidence from controversial industry sectors. *J. Bus. Ethics* 110 (4), 441–456.
- Islam, M.Z., Ahmed, S., Hasan, I., 2012. Corporate social responsibility and financial performance linkage: evidence from the banking sector of Bangladesh. *J. Organizational Manage.* 1 (1), 14–21.
- Jaiyeoba, H., Adewale, A.A., Quadry, M.O., 2018. Are Malaysian Islamic banks' corporate social responsibilities effective? A stakeholders' view. *Int. J. Bank Mark.* 36 (1), 111–125.
- Jizi, M.I., Salama, A., Dixon, R., Stratling, R., 2014. Corporate governance and corporate social responsibility disclosure: evidence from the US banking sector. *J. Bus. Ethics* 105, 601–615.
- Jo, H., Na, H., 2012. Does CSR reduce firm risk? Evidence from controversial industry sector. *J. Bus. Ethics* 110, 441–456.
- Khan, M.M., 2016. CSR standards and Islamic banking practice: a case of Meezan Bank of Pakistan. *J. Dev. Areas* 50 (5), 295–306.
- Kitzmueller, M., Shimshack, J., 2012. Economic perspectives on corporate social responsibility. *J. Eco. Literature.* Am. Eco. Asso. 50 (1), 51–84.
- Mallin, C.A., Farag, H.I.A., Ow-Yong, K., 2014. Corporate social responsibility and financial performance in Islamic bank. *J. Econ. Behav. Organ.* 103, s21–s38.
- Maqbool, S., Zameer, M.N., 2018. Corporate social responsibility and financial performance: an empirical analysis of Indian banks. *Future Bus. J.* 4 (1), 84–93.
- Meng-Wen, W., Chung-Hua, S., 2013. Corporate social responsibility in the banking industry: motives and financial performance. *J. Bank. Financ.* 37 (9), 3529–3547.
- Meng-Wen, W., Chung-Hua, S., Chen, S., 2017. Application of multi-level matching between financial performance and corporate social responsibility in the banking industry. *Rev. Quant. Financ. Account.* 49 (1), 29–63.
- Nobanee, H., Ellili, N., 2015. Corporate social responsibility disclosure in annual reports: evidence from UAE banks: Islamic vs conventional. *Renew. Sustain. Energy Rev.* 55, 1336–1341.
- Paltrinieri, A., Floreani, J., Kappen, J.A., Mitchell, M.C., 2018. Islamic, socially Responsible, and conventional markets comovements: evidence from stock indices. *Thunderbird Int. Bus. Rev.* 1–15.
- Quttainah, M.A., Almutari, A.R., 2017. Corporate ethics: evidence from Islamic banks. *J. Manag. Gov.* 21 (4), 815–840.
- Sairally, B.S., 2013. Evaluating the corporate social performance of Islamic financial institutions: an empirical study. *Int. J. Islam. Middle East. Financ. Manag.* 6 (3), 238–260.
- Sassen, R., Hinze, A.K., Hardeck, I., 2016. Impact of ESG factors on firm risk in Europe. *Z. F&R Betriebswirtschaft* 86 (8), 867–904.
- Williams, G., Zinkin, J., 2010. Islam e CSR: a study of the Compatibility between the Tenets of Islam and the UN global compact. *J. Bus. Ethics* 91 (4), 519–533.
- Wintoki, M.B., Linck, J.S., Netter, J.M., 2012. Endogeneity and the dynamics of internal corporate governance. *J. financ. econ.* 105 (3), 581–606.
- Wooldridge, J.M., 2015. *Introductory Econometrics: a Modern Approach.* Nelson Education.