Do formal and informal institutions shape the influence of sustainable banking on financial development?

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ABSTRACT

This paper explores the moderating role of formal and informal institutions on the sustainable banking and financial development link. We compute an aggregated measure of sustainability in the banking sector for a sample of 46 countries for the period 2010-2018. Our results indicate that sustainable banking positively influences financial development only in countries with strong formal institutions. Nevertheless, informal institutions can generate the necessary trust in the banking sector, allowing the positive effect of sustainable banking on financial development in countries with weak formal institutions. The results are robust after controlling the potential endogeneity issues.

1. Introduction

After the 2007/2008 crisis, banks have shown significant proactivity in developing sustainable practices. This interest results from the need to restoring their damaged reputation after this distressing episode (Forcadell and Aracil, 2017). Moreover, in a macro-economic context characterized by low-interest rates, stringent regulations, and the Sustainable Development Goals (SDGs) emergence, banks need to search for new investment opportunities combining profitability and sustainability.

Financial intermediaries have traditionally contributed to financial development and economic growth by fostering the functioning of the lending channel and proving efficiency in the asset allocation channel (e.g., Rajan and Zingales, 1998; Claessens and Laeven, 2003). Besides, sustainable banking has the potential to further improve financial development by promoting depth (size and liquidity), access (the ability of individuals and companies to access financial services), and efficiency (the ability of financial institutions to provide financial services at low cost and with sustainable revenues) in the banking market (Svirydzenka, 2016). Hence, sustainable banking can play a decisive role in the current scenario by combining desirable environmental and social goals (Aracil *et al.,* 2021) and high levels of financial development. Nevertheless, the country's formal and informal institutions (La Porta *et al.,* 1998; Guiso *et al.,* 2004; Ng *et al.,* 2016) could potentially shape the effect of sustainable banking on financial development. Thus, this paper analyses the influence of sustainable banking on financial development and how formal and informal institutions may affect this relationship.

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This paper contributes to the literature as follows. First, it incorporates the analysis of the effect of sustainable banking on financial development into the finance literature. Second, this study contributes to the law and finance literature (La Porta *et al.*, 1998; Guiso *et al.*, 2004; Ng *et al.*, 2016) by combining formal and informal institutions on the relationship between sustainable banking and financial development. Third, it measures the ESG (environmental, social, and governance) dimensions in the banking sector computed for 46 countries during 2010-2018. This global database allows controlling for quantitative differences (macroeconomic factors) and qualitative features (formal and informal institutions) across countries, potentially affecting the relationship between sustainable banking and financial development.

2. Institutions, sustainable banking, and financial development

The quality of formal institutions constitutes a key determinant of a country's financial and economic development (Levine *et al.*, 2000; Rajan and Zingales, 2003; Ergungor, 2004; Baltagi *et al.*, 2009; Mishkin, 2009; Rajan and Ramcharan, 2011). Institutional quality fosters well-functioning financial systems guaranteeing funding to the most efficient investments (La Porta *et al.*, 1998; Haber *et al.*, 2008). Nevertheless, the financial and economic activity also relies on informal institutions (Guiso *et al.*, 2004; Xu, 2020). In particular, informal institutions may constitute the main rules of interaction in developing countries when formal institutions and markets fail (Williamson, 2009). Systems of institutions are comprised of different complementary and substitutable institutions, both formal and informal (Roland, 2004). As institutions generate the necessary trust for well-functioning economic and financial systems (Bachmann and Inkpen, 2011), formal and informal institutions constitute supplementary trust generators.

Culture refers to "those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation" (Guiso *et al.*, 2006: 23). The country's culture depicts informal institutions (North, 1990). Formal and informal institutions constrain individual behaviors, as the culture does. Nevertheless, culture, and thus informal institutions, tend to be more slow-moving than formal institutions (Roland, 2004). Consequently, changes in formal institutions do not immediately imply changes in cultural values; for example, low levels of cultural acceptance of banks could remain in strong formal institutional environments. On the contrary, it can coexist high levels of acceptance of banks with weak institutions during long periods.

The definition of Guiso *et al.* (2006) identifies culture with beliefs. Lewicki & Wiethoff (2000) refer to trust as an individual attitude or behavior influenced by beliefs. Thus, culture determines (individual) trust, i.e., trust in banks (Huff and Kelley, 2005). Culture emerges from accumulated knowledge during an extended period (Roland, 2004). This accumulated knowledge (i.e., culture) generates trust. Reputation, i.e., the banking sector's reputation, arises from accumulated knowledge regarding past behaviors predicting future behavior (Lange *et al.*, 2011) that generates trust. Thus, as a form of accumulated knowledge, banking reputation can shape informal institutions (culture), generating trust in banking. Reputation emerges as a mechanism that conveys informal behavioral norms as a generator of trust (Bachmann and Inkpen, 2011).

Sustainable banking provides financial products and services that allow incorporating the poorest people into the financial market, i.e., microfinance. Sustainable banking also generates trust, necessary for developing financial markets (Xu, 2020). Both elements improve financial inclusion (Xu, 2020), which increases financial development, especially in developing countries. Nevertheless, given the opaqueness that characterizes banking business (Levine, 1997), trust in the banking sector generated by cultural factors is necessary to guarantee the positive role of sustainable banking on financial development in the absence of strong formal institutions. Trust is particularly relevant for sustainable banking[1] as it relies on meeting the needs of people and assuring sustainability (Yip and Bocken, 2018). This circumstance makes it even more critical that stakeholders (particularly customers) trust the genuineness of (sustainable) banks' actions.

As a result of the above reasoning, we argue that sustainable banking requires trust to positively affecting financial development. However, in the absence of solid (formal) institutional contexts generators of trust, informal institutions (e.g., cultural factors) are necessary to assure the effect of sustainable banking on financial development.

2. Method

2.1. Variables

Following previous studies (Aggarwal *et al.*, 2011; Arestis *et al.*, 2002; Baltagi *et al.*, 2009; Beck *et al.*, 2003; Hassan *et al.*, 2011; Ruiz, 2018), we use the domestic credit provided by financial institutions to the private sector as a percentage of GDP (FD_{it}) as the main proxy for financial development. We estimate a proxy of sustainable banking (SB_{it}) at aggregated level in the country i in the year t (See Table 1 for a description of variables). Table 2 reports the list of countries included in our sample and the percentage of the banking industry's total assets in each country included in our sustainable banking measure.

We consider the rule of law index from the Worldwide Governance Indicators (WGI) to measure the quality of formal institutions in each country (RL_{it-1}). This variable captures the level of confidence in the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence (Kaufmann *et al.*, 2008). We use the indicators of trust of World Values Surveys to approximate the quality of informal institutions and, specifically, the level of trust in the banking sector. Concretely, we use

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[1] Alternatively, for related concepts such as ethical banking (Birindelli *et al.*, 2015), eco-banking, or green-banking (Bose, Khan and Monem, 2021).

Table 1
Variable description and sources

Variable	Description	Source	Obs	Mean	Std. Dev.	Min	Max
Dependent variable							
FD_{it}	It measures the level of financial development in each country. It is computed calculating domestic credit to the private sector as a percentage of GDP which excludes central banks as lenders and government and state-owned enterprises as a borrower (Aggarwal et al., 2011; Arestis et al., 2002; Baltagi et al., 2009; Beck et al., 2003; Hassan et al., 2011; Ruiz, 2018).	WDI	290	81.349	45.170	12.690	193.040
Independent variable							
SB_{it}	It is the measure of sustainable banking, computed as an aggregated presence of sustainable banks per country. $$SB_{it} = \sum_{j=1}^{n_i} \frac{A_{jit}}{A_{it}} SB_{ijt}$$ Where A_{jit} is the total asset of bank j located in the country i in the year t, n_i is the number of commercial banks located in country i. $A_{it} = \sum_{j=1}^{n_i} A_{jit}$ is the total assets of banks located in the country i in the year t. SB_{ijt} is the level of sustainability of bank j located in the country i in the year t. We have considered the scores on ESG dimensions provided by EIKON-Thomson Reuters as the proxy for sustainable banking (Cheng *et al.*, 2014; Forcadell *et al.*, 2020; Mervelskemper and Streit 2017; Sassen *et al.*, 2016; Velte, 2016).	EIKON Orbis Bank Focus database (Bureau van Dijk)	290	69.465	9.763	35.772	90.825
Moderating Variable							
RL_{it}	The rule of law index. It captures the level of confidence in the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence (Baltagi *et al.*, 2009; Kaufmann *et al.*, 2008; La Porta *et al.*, 1998; Mishkin, 2009; Rajan and Ramcharan, 2011; Rajan and Zingales, 2003).	WGI	290	0.727	0.848	-0.886	2.100
$Trust_{it}$	It is the measure of confidence in the banking sector. To compute it, we have used World Value Survey's question about the confidence level generated by the banks in each country. We use the annual average value of variable E069 in the survey. (Fungáčová *et al.*, 2019; Xu, 2020).	World Value Survey	164	2.474	0.383	1.774	3.385
Control Variables							
EFW_{it}	It is the measure of financial liberalisation. We use the EFW index average -areas 3D, 4C, 4D, and 5A (Baltagi *et al.*, 2009; Chinn and Ito, 2002).	EFW	290	8.315	1.111	3.970	9.400
$Growth_{it}$	The annual percentage growth rate of GDP at market prices is based on constant local currency (Hassan *et al.*, 2011).	WDI	290	2.803	2.767	-7.300	25.162
$Educ_{it}$	It is the measure of educational expenditure. It is referred to the current operating expenditures in education, including wages and salaries, and excluding capital investments in buildings and equipment (% of GNI) (Hassan *et al.*, 2011).	WDI	290	4.686	1.381	1.760	8.070
$Trade_{it}$	It is the trade openness computing by adding imports and exports in goods and services as a share of GDP (Chinn and Ito, 2002; Hassan *et al.*, 2011; Mishkin, 2009; Rajan and Zingales, 2003; Svaleryd and Vlachos, 2002).	WDI	290	86.672	46.144	22.486	226.041
$Frac_{it}$	Ethnic fractionalisation (relevant groups) (Beck *et al.*, 2003).	EPR-ETH	290	0.359	0.375	0.000	1.991
Variables for the function controls							
$Life_{it}$	Life expectancy at birth, total (years)	WDI	290	76.663	6.238	45.100	84.100
Nat_{it}	Total natural resources rents (% of GDP)	WDI	290	3.330	6.432	0.018	50.486
Dam_{it}	A value of all damages and economic losses directly or indirectly related to a natural disaster (thousands per capita).	EM-DAT	290	44.624	261.466	0	4,105.848
BoP_{it}	The current account balance is the sum of net exports of goods and services, net primary income, and net secondary income. Data are in billions of current U.S. dollars (Chinn and Ito, 2002).	WDI	290	-9.071	72.935	-45.568	16.587
$Neighboring_{it}$	Trade openness of neighboring countries (Baltagi *et al.*, 2009).	WDI	290	0.638	0.380	0.000	1.537
$USFinanOp_{it}$	The U.S. financial openness is defined as the volume of a country's foreign assets and liabilities expressed as a GDP percentage. It has been estimated with data from Alfaro *et al.*, (2014).	Alfaro *et al.*, (2014)	290	31.645	3.800	23.272	36.822

Table 2
Percentage of assets included in the ESG index of countries included in the sample (2017)

Countries	% of Assets with ESG index	Countries	% of Assets with ESG index
Argentina	72.6%	Lesotho	91.7%
Australia	99.2%	Malaysia	80.8%
Austria	42.0%	Mexico	39.8%
Brazil	59.7%	Morocco	37.2%
Bulgaria	74.8%	Netherlands	47.6%
Chile	44.4%	New Zealand	84.4%
Colombia	66.8%	Norway	67.1%
Croatia	83.7%	Paraguay	43.7%
Czech Republic	55.9%	Peru	69.9%
Denmark	42.3%	Philippines	49.5%
Estonia	66.1%	Polonia	73.9%
Finland	47.0%	Portugal	42.8%
Georgia	73.2%	Qatar	86.2%
Greece	97.8%	Romania	64.6%
Hungary	63.2%	Saudi Arabia	99.8%
India	58.2%	Slovak Republic	39.6%
Indonesia	74.0%	South Africa	95.0%
Ireland	69.4%	Spain	71.7%
Israel	84.5%	Sweden	53.4%
Italy	65.2%	Thailand	78.3%
Japan	41.0%	Turkey	62.5%
Korea, South	56.9%	United Kingdom	87.7%
Latvia	58.40%	United States	60.4%

Table 3
Identification of thresholds for the rule of law index and the trust variable

	Threshold estimate	LM-test
RL_{it}	1.008	40.370**
$Trust_{it}$	2.254	13.540*

The number of bootstrap replications: 400.
Trimming percentage: 0.15.
****p < 0.001;***p < 0.01, **p < 0.05, *p < 0.1.

the annual mean of trust level in banking (Fungáčová *et al.*, 2019; Xu, 2020)[2].

2.2. Model

We define a threshold regression model to explain how sustainable banking affect financial development (FD_{it}) differently depending on the influence of the quality of both formal and informal institutions. It takes the following form:

$$FD_{it} = \alpha + \beta_1 RL_{it-1} + \beta_2 SB_{it-1} \times I(RL_{it-1} \leq \lambda_{RL}) + \beta_3 SB_{it-1} \times I(RL_{it-1} > \lambda_{RL}) + \gamma X_{it-1} + \tau_t + \zeta_i + \epsilon_{it} \tag{1}$$

This specification allows analyzing the impact of sustainable banking on financial development in two different subsamples according to the rule of law index: (i) in the case in that it is equal or below λ_{RL} and (ii) for those country-year observations characterized by a level of institutional quality above λ_{RL}.

The simultaneous inclusion of the variables that approximates the quality of both formal and informal institutions in the model [1] generates collinearity problems. Hence, we split the sample into two subsamples of country-year observations defined according to λ_{RL}. The first one includes the set of country-year observations characterized by a low rule of law index ($RL_{it} \leq \lambda_{RL}$). The second one is composed of those observations with the highest values of the rule of law index ($RL_{it} > \lambda_{RL}$). Then, we estimate the following regression for both subsamples:

$$FD_{it} = \alpha + \beta_1 RL_{it-1} + \beta_2 Trust_{it-1} + \beta_3 RL_{it-1} \times Trust_{it-1} + \beta_4 SB_{it-1} \times I(Trust_{it-1}$$
$$\leq \lambda_{Trust}) + \beta_5 SB_{it-1} \times I(Trust_{it-1} > \lambda_{Trust}) + \gamma X_{it-1} + \tau_t + \zeta_i + \epsilon_{it} \tag{2}$$

This specification considers the institutional development and the trust in banking simultaneous moderation. In the subsample formed by the countries with a weak institutional development, the coefficient β_4 captures the effect of sustainable banking on financial development in countries with weak formal institutions and low levels of trust in banks. The coefficient β_5 refers to the effect of sustainable banking on financial development in countries characterized by weak formal institutions and high levels of trust in

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[2] Table 1 provides details on the description of the main variables and sources.

Table 4
Effect of sustainable banking on financial development and the role of institutional quality

	Model 1 All Sample Mixed		Model 2 All Sample Mixed		Model 3 $RL_{it-1} \leq 1.008$ Mixed		Model 4 $RL_{it-1} > 1.008$ Mixed	
	FD_{it}		FD_{it}		FD_{it}		FD_{it}	
SB_{it-1}	13.825				-2.909		30.887	*
	(8.983)				(8.354)		(16.419)	
RL_{it-1}	28.604	****	23.685	****	11.201	**	34.676	***
	(3.989)		(4.138)		(4.677)		(12.34)	
$SB_{it-1} \times I(RL_{it-1} \leq 1.008)$			3.452					
			(9.204)					
$SB_{it-1} \times I(RL_{it-1} > 1.008)$			22.780	**				
			(9.094)					
EFW_{it-1}	-1.900		-1.683		0.624		-8.529	***
	(1.197)		(1.169)		(1.072)		(2.958)	
$Growth_{it-1}$	-1.356	****	-1.311	****	-1.240	****	-1.259	****
	(0.206)		(0.201)		(0.214)		(0.318)	
$Educ_{it-1}$	6.436	****	6.461	****	0.052		7.451	****
	(1.210)		(1.181)		(1.424)		(1.824)	
$Frac_{it-1}$	0.363		2.938		18.073		7.347	
	(13.324)		(13.310)		(14.484)		(16.23)	
$Trade_{it-1}$	-0.265	***	-0.251	***	-0.095		-0.464	***
	(0.079)		(0.077)		(0.078)		(0.114)	
Constant	-41.451		-38.231		63.156		118.509	
	(66.647)		(66.192)		(16.248)		(38.805)	
Number of observations	290		290		171		119	
Countries	46		46		29		19	
R^2	0.954		0.956		0.975		0.939	
Max VIF	2.070		17.600		1.320		1.640	
Temporal Dummies	YES		YES		YES		YES	

****p < 0.001;***p < 0.01, **p < 0.05, *p < 0.1.

banks. We have repeated the analysis with the subsample of countries with strong institutions. Table 3 reports the thresholds identified for RL_{it} and $Trust_{it-1}$, following the methodology proposed by Hansen (2000).

X_{it-1} is a vector of control variables described in Table 1 and that could be potentially affecting financial development. τ_t is the set of time fixed-effects that allows removing universal time-related shocks from the errors. We estimate equation [1] by the maximum likelihood of linear random-intercept or linear mixed model with robust standard errors clustered by country. Thus, the random intercept ζ_j is a country-specific error component representing the combined effect of omitted country-level characteristics or unobserved heterogeneity at the country level. ε_{jt} is the error term. All variables are lagged by one period to mitigate potential endogeneity concerns.

3. Results

Model 1 (Table 4) reports the results testing the impact of sustainable banking on financial development. Models 2 to 4 show the results of the impact of the quality of formal institutions on the relationship between sustainable banking and financial development. The coefficient of SB_{it-1}, although positive, is not significant in Model 1. RL_{it-1} enters the regression with a positive and statistically significant coefficient, indicating that the level of institutional quality contributes positively to financial development. Results in Model 2 report a non-significant coefficient for the interaction term between SB_{it-1} and $[SB_{it-1} \times I(RL_{it-1} \leq 1.008)]$. However, the coefficient of the interactive term with $[SB_{it-1} \times I(RL_{it-1} > 1.008)]$ is positive and statistically significant. These results suggest that, per se, sustainable banking is not enough to foster financial development in a country. On the contrary, it seems to require a minimum level of institutional quality, proxied by the rule of law indicator.

As interactions $SB_{t-1} \times I(RL_{t-1} \leq 1.008)$ and $SB_{t-1} \times I(RL_{t-1} \leq 1.008)$ are highly correlated[3], in Models (3) and (4) we split our sample into two subsamples of country-year observations defined around the threshold level computed for the rule of law index. Hence, Model 3 refers to the subsample of country-year observations characterized by the lowest values of the rule law index. In contrast, Model 4 presents the regression results obtained for the subsample of country-year observations referred to the highest values of the rule of law variable. As can be seen, the coefficient for SB_{t-1} in Model 3 is not significant. However, SB_{t-1} presents a positive and statistically significant coefficient in Model 4. These findings are consistent with the results previously reported in Model 2 and confirm the need for a minimum level of institutional quality so that sustainable banking positively affects financial development.

Once we have analyzed the impact of sustainable banking on financial development across countries with different levels of institutional quality, we examine how informal institutions may shape the relationship between sustainable banking and financial development. We test if the influence of trust on the impact of sustainable banking on financial development is heterogeneous across countries depending on institutional quality. Hence, we split the sample around the threshold value of the rule of law index. In Models

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[3] VIF test reports a value of 17.600.

Table 5
Effect of sustainable banking on financial development and the role of institutional quality and trust

	Model 5 $RL_{it-1} \leq$ 1.008 Mixed	Model 6 $RL_{it-1} \leq$ 1.008 Mixed	Model 7 $RL_{it-1} \leq$ 1.008 Mixed	Model 8 $RL_{it-1} >$ 1.008 Mixed	Model 9 $RL_{it-1} >$ 1.008 Mixed	Model 10 $RL_{it-1} >$ 1.008 Mixed	Model 11 $RL_{it-1} >$ 1.008 Mixed	Model 12 $RL_{it-1} >$ 1.008 Mixed
	FD_{it}	FD_{it}	FD_{it}	FD_{it}	FD_{it}	FD_{it}	FD_{it}	FD_{it}
SB_{it-1}	-6.567	-9.305	-9.910	45.366 ***	41.897 **	43.372 **	42.890 **	42.632 **
	(7.866)	(8.247)	(8.259)	(17.263)	(19.422)	(20.125)	(19.442)	(20.024)
RL_{it-1}	-40.347	5.558		283.265 ****	38.951 ****		36.851 ****	
	(27.353)	(5.772)		(64.019)	(11.862)		(11.423)	
$Trust_{it-1}$	-6.706	-21.679	-21.979	181.828 ****	17.262	-10.527		
	(7.417)	(13.510)	(13.465)	(47.045)	(27.692)	(27.116)		
$RL_{it-1} \times Trust_{it-1}$	16.644		2.845	-95.432 ****		13.014 ***		12.960 ****
	(10.693)		(2.364)	(25.336)		(4.838)		(4.841)
$SB_{it-1} \times I(Trust_{it-1} > 2.254)$	11.160 ***	12.127 ***	12.376 ***	1.479	1.996	1.791	3.939	0.408
	(3.541)	(3.832)	(3.833)	(4.518)	(5.775)	(5.968)	(4.898)	(4.797)
EFW_{it-1}	1.009	0.166	0.143	-2.663	7.897	8.633	8.611	8.307
	(0.948)	(0.860)	(0.826)	(6.644)	(7.160)	(7.370)	(7.083)	(7.310)
$Growth_{it-1}$	0.0781	-0.017	-0.045	0.294	0.026	0.076	-0.000	0.098
	(0.259)	(0.246)	(0.248)	(0.468)	(0.526)	(0.543)	(0.527)	(0.540)
$Educ_{it-1}$	0.604	1.516	1.520	1.545	1.051	1.300	1.006	1.367
	(1.771)	(1.827)	(1.821)	(2.234)	(2.352)	(2.418)	(2.362)	(2.416)
$Frac_{it-1}$	82.437 *	39.628 *	39.712 *	45.835 **	23.460	17.107	17.417	20.425
	(43.613)	(22.536)	(22.380)	(19.48)	(19.628)	(19.313)	(16.990)	(17.444)
$Trade_{it-1}$	-0.071	-0.049	-0.047	-0.145 *	-0.229 **	-0.229 **	-0.231 **	-0.225 **
	(0.048)	(0.051)	(0.050)	(0.082)	(0.092)	(0.095)	(0.092)	(0.095)
Constant	38.713	97.582 **	98.903 ***	-408.066 ****	-57.235	15.238	-17.401	-7.974
	(28.246)	(38.359)	(38.263)	(115.888)	(93.742)	(92.475)	(70.110)	(71.872)
Number of observations	79	79	79	58	58	58	58	58
Countries	16	16	16	10	10	10	10	10
R^2	0.994	0.993	0.994	0.988	0.981	0.979	0.980	0.979
Max VIF	119.060	3.110	3.140	273.180	9.370	9.710	4.590	5.510
Temporal Dummies	YES	YES	YES	YES	YES	YES	YES	YES

****p < 0.001;***p < 0.01, **p < 0.05, *p < 0.1.

Table 6
Effect of sustainable banking on financial development and the role of institutional quality and trust: Control functions.

	Model 13 $RL_{it-1} \leq 1.008$ Mixed		Model 14 $RL_{it-1} \leq 1.008$ Mixed		Model 15 $RL_{it-1} > 1.008$ Mixed		Model 16 $RL_{it-1} > 1.008$ Mixed	
	$FinDev_{it}$		$FinDev_{it}$		$FinDev_{it}$		$FinDev_{it}$	
SB_{it-1}	-8.792		-9.435		46.554	**	64.375	****
	(8.453)		(8.490)		(19.548)		(19.809)	
RL_{it-1}	4.806				36.020	****		
	(6.451)				(11.681)			
$Trust_{it-1}$	-20.242		-20.756					
	(14.258)		(14.247)					
$RL_{it-1} \times Trust_{it-1}$			2.621				14.966	***
			(2.631)				(5.168)	
$SB_{it-1} \times I(Trust_{it-1} \leq 2.254)$								
$SB_{it-1} \times I(Trust_{it-1} > 2.254)$	11.840	***	12.068	***	3.037		-0.997	
	(4.097)		(4.115)		(5.284)		(4.778)	
EFW_{it-1}	0.360		0.298		9.016		3.344	
	(1.091)		(1.052)		(7.156)		(7.295)	
$Growth_{it-1}$	-0.035		-0.068		-0.161		0.233	
	(0.262)		(0.266)		(0.531)		(0.548)	
$Educ_{it-1}$	1.596		1.603		0.640		2.552	
	(1.841)		(1.840)		(2.352)		(2.566)	
$Frac_{it-1}$	40.163	*	40.048	*	16.907		21.296	
	(22.459)		(22.310)		(17.085)		(17.545)	
$Trade_{it-1}$	-0.052		-0.047		-0.174		-0.135	
	(0.070)		(0.069)		(0.109)		(0.105)	
$\hat{u}(EFW)_{it}$	-0.282		-0.236		-7.521		-14.127	
	(0.875)		(0.870)		(9.033)		(8.901)	
$\hat{u}(Trade)_{it}$	-0.068		-0.084		0.093		-0.081	
	(0.287)		(0.287)		(0.604)		(0.610)	
$\hat{u}(Growth)_{it}$	0.0056		0.0049		-0.130		-0.175	
	(0.067)		(0.067)		(0.117)		(0.113)	
Constant	92.124	**	94.156	**	-25.823		-4.569	
	(41.921)		(42.080)		(71.230)		(69.795)	
Number of observations	79		79		58		58	
Countries	16		16		10		10	
R^2	0.994		0.994		0.981		0.982	
Max VIF	4.600		4.580		7.970		8.840	
Temporal Dummies	YES		YES		YES		YES	

****$p < 0.001$;***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

5 to 7 of Table 5, we run the regression testing the role of sustainable banking and trust on financial development over the set of country-year observations with low levels of the rule of law index ($RL_{it-1} \leq 1.008$). In Models 8 to 12, we consider the subsample of country-year observations corresponding to high levels of the rule of law($RL_{it-1} > 1.008$). In Model 5, the coefficients of SB_{it-1}, RL_{it-1}, and $Trust_{it-1}$are not statistically significant. The interaction $RL_{it-1} \times Trust_{it-1}$ also enters the regression with a non-significant coefficient. However, the coefficient of the interaction $SB_{it-1} \times I(Trust_{it-1} > 2.254)$ is positive and significant, suggesting that in countries characterized by low levels of quality of formal institutions, sustainable banking fosters financial development if trust in the banking sector, as a proxy of the quality of informal institutions, is high. The high value of the VIF test, however, evidences the existence of collinearity problems caused by the high correlation between RL_{it-1} and $RL_{it-1} \times Trust_{it-1}$. Thus, we estimate Model 6, without the interaction $RL_{it-1} \times Trust_{it-1}$, and Model 7, without RL_{it-1}. Results for both Models are closely similar to those obtained for Model 5.

In Model 8, SB_{it-1}, RL_{it-1}, and $Trust_{it-1}$ as well as the interaction $RL_{it-1} \times Trust_{it-1}$ are significant. However, the high value of the VIF test, caused by the correlation between $RL_{it-1}$and the interactive term $RL_{it-1} \times Trust_{it-1}$, may question these results. Therefore, in Model 9, we exclude the interaction $SB_{it-1} \times Trust_{it-1}$. Similarly, $Trust_{it-1}$is excluded in Model 10. In both cases, the coefficients of the variable that proxies for sustainable banking are positive and significant, whereas the interaction $SB_{it-1} \times I(Trust_{it-1} > 2.254)$ is not significant at conventional levels. In Models 9 and 10, the max VIFs are still slightly high. Therefore, in Models 11 and 12, we exclude the variable $Trust_{it-1}$. As can be seen, the results remain invariant and confirm that, in countries characterized by the high quality of formal institutions, sustainable banking positively influences financial development regardless of the level of trust in banks. Nevertheless, in countries where formal institutions are not well-developed, a minimum quality level for informal institutions helps to foster a positive relationship between sustainable banking and financial development.

The potential reverse causality affecting some variables (e.g., financial development and economic growth, trade openness, and financial liberalization) and variables omitted generate endogeneity problems. To address this problem, we have used a control function (Wooldridge, 2015). We estimate by the maximum likelihood of linear random-intercept the reduced forms for three variables in the first step. In the estimation of economic growth, we have included, in addition to the variables of the structural equation, the

total natural resources rents and the value of damages and economic losses related to the occurrence of natural disasters[4]. In the reduced forms of trade openness, the new variables are the average trade openness of neighboring countries and the U.S. financial openness (Baltagi *et al.,* 2009). Finally, in the reduced form of financial liberalization, we have used the current account balance of BoP (Chinn and Ito, 2002). The results are reported in Table 6 and are closely similar to those previously reported.

4. Conclusions

Our results indicate that sustainable banking fosters financial development. Nevertheless, the relationship is not homogeneous across countries due to specific formal institutions in each country. Empirical results reveal the role of well-developed institutions that allow sustainable banking to promote financial development that ultimately can contribute to achieving sustainable goals. Notably, informal institutions play a decisive role in counteracting formal institutional weaknesses that impede sustainable banking's positive influence on financial development. Future lines of research should deepen into the main channels through which sustainable banking improves financial development. Special attention deserves the country-level characteristics to understand better the well-functioning channels that make the positive effect of sustainable banking on financial development possible. Moreover, studying the ultimate effects of sustainable banking on economic growth and income inequality constitutes a straightforward extension of this line of research.

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[4] Table 1 provides more details.

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