Corporate governance and financial inclusion

Peterson K. Ozili
Central Bank of Nigeria, Abuja, Nigeria

Received 1 September 2022
Revised 5 May 2023
Accepted 5 May 2023

Abstract

Purpose – This paper examines the association between corporate governance and financial inclusion in terms of correlation. This paper examines whether countries that have a strong corporate governance environment also experience better financial inclusion outcomes.

Design/methodology/approach – The indicators of financial inclusion are automated teller machines (ATMs) per 100,000 adults, bank accounts per 1,000 adults and bank branches per 100,000 adults, while the indicators of corporate governance are extent of corporate transparency index, the extent of director liability index, the extent of disclosure index, the extent of ownership and control index, the extent of shareholder rights index, minority investors protection index and ease of shareholder suits index. The association was analyzed using Pearson correlation analysis and granger causality test.

Findings – Strong corporate governance is significantly associated or correlated with better financial inclusion outcomes. The regional analyses show that corporate governance has a significant positive association with financial inclusion in Asian countries and in Middle East countries. However, a positive and negative association was observed between some indicators of corporate governance and financial inclusion in European countries, North American countries, South American countries, African countries and in Middle East and North Africa (MENA) countries, implying that strong corporate governance has a positive and negative association with financial inclusion depending on the indicators of corporate governance and financial inclusion used. There is also evidence of uni-directional granger causality between corporate governance and financial inclusion.

Originality/value – Little is known about the association between corporate governance and financial inclusion. This paper is the first to examine this association.

Keywords Financial inclusion, Corporate governance, Financial institutions

Paper type Research paper

1. Introduction

Corporate governance mechanisms are put in place to constrain and regulate corporate behavior and to ensure that outside investors get a fair return on their investment (Marnet, 2005). A strong corporate governance environment ensures that corporations engage in responsible corporate behavior. It creates a business environment where corporations are held accountable for their behavior and decisions. It also creates a business environment that compels corporations to do what they say they will do in the production and delivery of goods and services. This extends to financial institutions that deliver financial services to end users in well-served and underserved communities.

A strong corporate governance environment ensures that financial institutions are held accountable in the provision of financial services to unbanked and banked customers through their corporate behavior and decisions. As financial institutions expand into rural and urban communities, they have an obligation to expand financial services to members of the communities they operate in. Financial institutions operating in countries that have a strong corporate governance framework would prioritize the provision of financial services

Journal of Money and Business
Vol. 3 No. 1, 2023
pp. 89-107
Emerald Publishing Limited
e-ISSN: 2634-260X
p-ISSN: 2634-2596
DOI 10.1108/JMB-08-2022-0040

to customers in the immediate community to show their corporate accountability and responsibility to the community while protecting the interest of outside investors. This suggests an association between country-level corporate governance and financial inclusion. The implication is that a strong corporate governance environment has the potential to increase financial inclusion, while a weak corporate governance environment may be responsible for the low levels of financial inclusion observed in many countries despite the presence of many financial institutions in such countries.

The link between corporate governance and financial inclusion is very important. But policymakers and academic researchers have not considered how a strong corporate governance environment affects the level of financial inclusion in a country. Understanding how corporate governance affects the level of financial inclusion is important because it can provide insight into whether strong corporate governance environments are effective or ineffective in promoting financial inclusion through financial institutions. I address this issue in this paper by focusing on the association between country-level corporate governance mechanisms and country-level financial inclusion outcomes in terms of correlation and causality tests.

Using data from 46 countries and conducting correlation and causality tests, I find evidence of a significant correlation or association between strong corporate governance and better financial inclusion outcomes. The regional analyses show that corporate governance has a significant positive association with financial inclusion in Asian countries and in Middle East countries, while it has mixed association or correlation in European countries, North American countries, South American countries, African countries and in Middle East and North Africa (MENA) countries. There is also evidence of uni-directional granger causality between corporate governance and financial inclusion.

This study contributes to the literature in the following ways. One, the study contributes to the financial inclusion literature. It adds to studies that examine the factors that promote financial inclusion. The result suggests that a strong corporate governance environment can enhance financial inclusion outcomes. Two, the study contributes to the literature that examine the benefits of corporate governance. This study adds to such studies by showing that corporate governance may have a positive effect on financial inclusion. Three, this study adds to policy debates about the factors promoting financial inclusion. This study shows that policymakers need to consider strong corporate governance as a possible institutional factor that enhances financial inclusion outcomes.

The rest of the paper is organized as follows. Section 2 presents the literature review. Section 3 presents the research methodology. Section 4 presents the empirical results. Section 5 presents the conclusion.

2. Literature review

Several studies have examined the determinants of financial inclusion. For instance, Kumar (2013) shows that bank branch network has a beneficial impact on financial inclusion. Ozili (2018) argues that digital financial services are effective in achieving financial inclusion because digital finance tools can be used to reach underserved people living in remote communities where traditional financial institutions refuse to go. Bozkurt *et al.* (2018) found that social, banking and political factors are significant determinants of the changes in the level of financial inclusion. Ozili (2021a), in a review of existing financial inclusion research, found that the level of financial innovation, poverty, the stability of the financial sector, the state of the economy and financial literacy are factors affecting the level of financial inclusion. Soumare *et al.* (2016) found that being male and married are positive determinants of financial inclusion for Central African countries whereas income is a significant positive determinant

of financial inclusion in West African countries and household size has a negative impact on account ownership in West African countries. Ozili (2021b) found that being educated and employed are positive determinants of financial inclusion in Nigeria. Singh *et al.* (2021) show that corporate social responsibility has a significant positive impact on financial inclusion. A strong corporate governance environment is linked to the quality of institutions in a country and the literature show that institutional quality has a positive effect on financial inclusion outcomes. For example, Lachebeb *et al.* (2021) examine the nonlinear relationship between political institutions and financial inclusion among 74 developing countries from 2007 to 2016. They found a U-shaped relationship between political institutions and financial inclusion, implying that better quality of political institutions leads to higher financial inclusion up to a threshold beyond which it decreases financial inclusion. Ali *et al.* (2016) examine the dynamic impact of institutional quality on financial inclusion in 52 developing countries from 2004 to 2010. They found that institutional factors such as government effectiveness, regulatory quality, political stability and absence of violence have a significant effect on financial inclusion. They conclude that countries should strengthen their institutions for progress towards financial inclusion. Ali *et al.* (2022) examine the moderating effect of institutional quality on the relationship between financial inclusion and financial development in religious countries from 2000 to 2016. They found that institutional quality positively affects financial inclusion. Muriu (2021) showed that institutional factors such as rule of law and regulatory quality are crucial in enhancing financial inclusion in African countries. Zulkhibri and Ghazal (2017) find that institutional governance positively influences financial inclusion by increasing the number of bank accounts in formal financial institutions, but it negatively affects borrowing behavior. Meanwhile, Eldomiaty *et al.* (2020) showed that control of corruption, government effectiveness, political stability and voice and accountability are significant factors influencing financial inclusion. Nkoa and Song (2020) showed that institutional quality increases financial inclusion as well as the penetration, accessibility and use of financial services in Africa.

Very few studies examine how corporate actions and decisions affect financial inclusion. For instance, Vo *et al.* (2021) showed that the corporate social responsibility activities of firms contribute to financial inclusion. Mousa and Ozili (2022) showed that financial firms can make a commitment to increase financial inclusion during a pandemic. They undertook a case study of a microfinance institution known as Grameen America. They analyze Grameen America's response to the coronavirus disease 2019 (COVID-19) pandemic and found that the microfinance institution increased its effort towards financial inclusion in order to alleviate poverty and to offer credit and noncredit services and support for its members, which is consistent with United Nation's (UN) Sustainable Development Goals (SDGs) 1 and 17.

3. Methodology

Financial inclusion and corporate governance data were collected for 46 countries from the World Bank's Global Financial Development indicators and the Doing Business indicators. The variables are described in Table 1. The sample period is from 2014 to 2019. The indicators of financial inclusion are automated teller machines (ATMs) per 100,000 adults, bank accounts per 1,000 adults and bank branches per 100,000 adults. The indicators of corporate governance are the extent of corporate transparency index, the extent of director liability index, the extent of disclosure index, the extent of ownership and control index, the extent of shareholder rights index, minority investors protection index and the ease of shareholder suits index. The descriptive statistic for the variables is reported in Table 2. Among the financial inclusion variables, the ATM variable is 47.03 on average and is higher than the BBP variable at 13.91 on average. The BAP variable is 886 on average. Among the

	Variable	Description	Source: World bank
Financial inclusion indicators:	ATM	Number of ATMs per 100,000 adults	Global financial development indicators
	BAP	Number of bank accounts (or number of depositors) with commercial banks per 1,000 adults	Global financial development indicators
	BBP	Number of commercial bank branches per 100,000 adults	Global financial development indicators
Corporate governance indicators:	CPI	Extent of corporate transparency index. It measures transparency on ownership stakes, compensation, audits and financial prospects	Ease of doing business indicators
	EDL	Extent of director liability index. It measures shareholders' ability to sue and hold directors liable for self-dealing	Ease of doing business indicators
	EDI	Extent of disclosure index. It measures the transparency of related-party transactions	Ease of doing business indicators
	OCI	Extent of ownership and control index. It measures the governance safeguards protecting shareholders from undue board control entrenchment	Ease of doing business indicators
	SRI	Extent of shareholder rights index. It measures shareholders' rights and role in major corporate decisions	Ease of doing business indicators
	PMI	Protecting minority investors	Ease of doing business indicators
	SSA	Ease of shareholder suits index (0–10) (DB15-20 methodology). It measures access to evidence and allocation of legal expenses in shareholder litigation	Ease of doing business indicators

Source(s): World Bank database

Table 1.
Variable description and source

corporate governance variables, the average values of the SSA and EDI variables are higher than the average values of the CPI, EDL, OCI, SRI and PMI variables. The association between financial inclusion and corporate governance are analyzed using the Pearson correlation test statistic and granger causality test.

4. Empirical results

4.1 Full sample analysis

The full sample correlation result, reported in Table 3, shows evidence of a significant positive correlation between the financial inclusion variables and the corporate governance variables. Two financial inclusion variables (i.e. the ATM and BAP variables) have a significant positive correlation with the seven corporate governance variables, i.e. the CPI, EDL, EDI, OCI, SRI, PMI and SSA variables. This indicates that strong corporate governance in terms of greater corporate transparency (CPI), greater director liability (EDL), greater corporate disclosure of related-party transactions (EDI), strong ownership and control (OCI), greater shareholders right (SRI), greater ease of shareholder suits against the firm (SSA) and greater minority shareholder protection (PMI) are significantly correlated with higher financial inclusion in terms of number of bank accounts with commercial banks (BAP) and higher ATM supply (ATM). The implication of the full sample correlation result is that better corporate governance is correlated with better financial inclusion outcomes in terms of higher

	ATM	BAP	BBP	CPI	EDL	EDI	OCI	SRI	PMI	SSA
Afghanistan	1.19	176.6	2.07	0	10	21	0	0	14	40
Argentina	52.72	1078.9	13.4	71	20	70	71	100	62	60
Bangladesh	7.92	708.6	8.7	43	70	60	43	67	60	70
Belize	40.47	682.3	20.2	0	40	30	0	0	28	70
Botswana	37.2	699.4	9.07	71	80	70	43	67	60	30
Brazil	109.8	627.9	19.9	86	80	50	57	67	62	40
Brunei	75.9	1565.1	19.1	0	65	40	0	0	37	80
Cabo Verde	47.9	1970.8	32.8	0	50	10	0	0	24	60
Colombia	41.6	1460.1	15.4	71	70	90	100	67	80	80
Comoros	5.06	127.5	3.12	0	10	68	0	0	25	48
Costa Rica	68.6	1222.8	20.8	14	50	30	43	44	39	47
Djibouti	10.4	163.1	6.9	0	45	51	0	0	24	22
Ecuador	34.2	796.8	10.4	14	50	18	40	83	43	60
El Salvador	35.7	896.3	13.4	43	0	30	14	67	36	70
Estonia	70.3	2147.1	10.4	71	30	80	29	83	58	60
Guinea	2.35	80.1	2.7	0	10	68	0	0	25	48
Israel	119.7	1037.6	18.6	86	90	70	57	67	78	90
Kuwait	66.2	1246.6	14.6	86	90	41	74	33	61	40
Kyrgyz Republic	32.7	518.9	8.14	0	50	70	0	0	40	80
Latvia	61.5	1321.7	16.07	40	50	71	83	90	60	–
Lebanon	37.4	581.5	22.6	43	10	90	14	50	44	50
Lesotho	13.6	373.1	3.7	0	40	30	0	0	32	90
Maldives	28	1010.1	12.07	0	80	0	0	0	32	80
Moldova	46.3	1217.0	37.9	86	40	70	57	83	68	80
Namibia	66.3	981.8	12.6	86	50	50	43	50	56	60
Nicaragua	18.9	310.9	9.35	0	50	10	0	0	24	60
North Macedonia	59.5	1006.7	24.7	78	87	92	79	83	77	45
Pakistan	9.4	340.2	9.9	71	63	60	100	83	71	60
Paraguay	26.7	346.8	10.01	0	50	60	0	0	34	60
Peru	106.2	846.1	7.68	64	60	90	29	100	67	60
Philippines	26.8	525.1	8.9	57	30	20	59	2.8	41	70
Poland	69.6	1088.5	30.5	86	20	70	57	83	66	90
Qatar	56.7	707.4	10.1	43	40	35	36	50	36	20
Rwanda	5.5	207.2	5.95	90	73	0	0	0	40	37
Saudi Arabia	72.8	998.6	8.4	69	82	83	50	72	66	40
Seychelles	76.8	1880.04	53.6	0	80	40	0	0	34	50
Singapore	59.6	2229.1	8.46	71	90	100	71	83	86	90
Thailand	116.6	1241.4	12.03	86	70	100	76	61	81	83
Turkey	82.1	1268.09	17.8	86	50	90	86	100	76	60
Uganda	4.3	268.5	2.79	71	50	30	72	50	56	70
Ukraine	93.7	1704.8	0.52	100	20	55	67	67	58	60
Uruguay	108.8	951.04	11.09	0	40	30	0	0	30	80
Uzbekistan	21.9	719.4	36.12	52	27	75	52	50	55	70
Zambia	11.1	295.8	4.37	57	60	40	57	50	56	70
Zimbabwe	6.7	361.7	6.91	43	20	80	43	100	53	47
Nigeria	15.9	787.06	4.99	85	70	60	71	67	70	
Aggregate statistics										
Mean	47.03	886.47	13.91	46.14	50.25	54.37	38.56	45.28	50.36	61.03
Median	41.29	813.85	10.45	57.14	50	60	42.85	50	54	60
Maximum	259.30	2424.75	56.22	100	90	100	100	100	86	100
Minimum	0.75	69.95	0.42	0	0	0	0	0	10	0.00
Std Dev	35.71	552.21	10.71	35.60	25.18	27.96	32.63	36.61	19.11	19.50
Skewness	1.16	0.65	1.71	−0.21	−0.15	−0.23	0.14	−0.14	−0.03	−0.58
Observations	276	276	276	276	276	276	276	271	271	270

Source(s): Author's computation

Table 2.
Descriptive statistics

Table 3.
Pearson correlation matrix (Full sample correlation matrix)

Variable	ATM	BAP	BBP	CPI	EDL	EDI	OCI	SRI	PMI	SSA
ATM	1.000									
	–									
BAP	0.584***	1.000								
	(0.00)	–								
BBP	0.293***	0.445***	1.000							
	(0.00)	(0.00)	–							
CPI	*0.332***	*0.249***	−0.002	1.000						
	(0.00)	*(0.00)*	(0.97)	–						
EDL	*0.294***	*0.274***	*0.122***	0.270***	1.000					
	(0.00)	*(0.00)*	*(0.04)*	(0.00)	–					
EDI	*0.281***	*0.223***	0.063	0.438***	0.084	1.000				
	(0.00)	*(0.00)*	(0.29)	(0.00)	(0.16)	–				
OCI	*0.227***	*0.244***	0.017	0.802***	0.299***	0.482***	1.000			
	(0.00)	*(0.00)*	(0.77)	(0.00)	(0.00)	(0.00)	–			
SRI	*0.294***	*0.288***	0.043	0.728***	0.094	0.592***	0.748***	1.000		
	(0.00)	*(0.00)*	(0.48)	(0.00)	(0.12)	(0.00)	(0.00)	–		
PMI	*0.393***	*0.377***	0.082	0.836***	0.475***	0.701***	0.860***	0.800***	1.000	
	(0.00)	*(0.00)*	(0.18)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	–	
SSA	*0.152***	*0.278***	*0.105**	0.040	0.071	0.152**	0.131**	0.051	0.313***	1.000
	(0.01)	*(0.00)*	*(0.08)*	(0.51)	(0.24)	(0.02)	(0.03)	(0.41)	(0.00)	–

Note(s): *P*-value is reported in parenthesis. ***, ** and *represent statistical significance at the 1%, 5 and 10%, respectively
Source(s): Author's computation

number of bank accounts with commercial banks, higher number of ATMs and higher number of bank branches.

4.2 African countries: correlation analysis

The African countries sample correlation result, reported in Table 4, shows evidence of a positive and negative correlation between the financial inclusion variables and the corporate governance variables. The corporate governance variables, particularly, the CPI, EDI, OCI, SRI and PMI variables are significant and inversely correlated with the BBP financial inclusion variable. The EDI variable is also significant and inversely correlated with the BAP financial inclusion variable. This indicates that greater corporate transparency (CPI), greater corporate disclosure of related-party transactions (EDI), strong ownership and control (OCI), greater shareholders right (SRI) and greater minority shareholder protection (PMI) are associated with low financial inclusion in terms of fewer bank branches and fewer bank accounts with commercial banks.

In contrast, the three financial inclusion variables (i.e. the ATM, BAP and BBP variables) have a significant positive correlation with the extent of director liability (EDL). This implies that greater director liability is associated with higher financial inclusion in terms of higher bank accounts with commercial banks (BAP), higher ATM supply (ATM) and increase in bank branches (BBP) in African countries. This suggests that greater director liability in African corporations is associated with better financial inclusion outcomes in terms of the number of bank accounts, ATMs supply and large number of bank branches in African countries. The implication of the correlation result is that better corporate governance may be positively or negatively correlated with financial inclusion outcomes in African countries depending on the indicators of financial inclusion and corporate governance used.

4.3 Asian countries: correlation analysis

The Asian countries sample correlation result, reported in Table 5, shows evidence of a significant positive correlation between the financial inclusion variables and the corporate governance variables. Specifically, the seven corporate governance variables, i.e. the CPI, EDL, EDI, OCI, SRI, PMI and SSA variables have a significant positive correlation with two financial inclusion variables (i.e. the ATM and BAP variables). This indicates that greater corporate transparency (CPI), greater director liability (EDL), greater corporate disclosure of related-party transactions (EDI), strong ownership and control (OCI), greater shareholders right (SRI), greater ease of shareholders' suit (SSA) and greater minority shareholder protection (PMI) are significantly correlated with higher financial inclusion in terms of bank accounts with commercial banks (BAP) and higher ATM supply (ATM) in Asian countries. Also, the CPI and EDI corporate governance variables are significant and positively correlated with the three financial inclusion variables (i.e. the ATM, BAP and BBP variables). The implication of the correlation result is that better corporate governance is associated with better financial inclusion outcomes in terms of the number of bank accounts, ATM supply and large number of bank branches in Asian countries.

4.4 European countries: correlation analysis

The European countries sample correlation result, reported in Table 6, shows evidence of a positive and negative correlation between the financial inclusion variables and the corporate governance variables. Specifically, the BAP financial inclusion variable has a significant negative correlation with the OCI, SRI and PMI corporate governance variables. The EDI variable is also significant and inversely correlated with ATM financial inclusion variable. The implication is that strong ownership and control (OCI), greater shareholders' right (SRI),

Table 4.
Pearson correlation matrix (African countries correlation matrix)

Variables	ATM	BAP	BBP	CPI	EDL	EDI	OCI	SRI	PMI	SSA
ATM	1.000									
	–									
BAP	0.855***	1.000								
	(0.00)	–								
BBP	0.809***	0.875***	1.000							
	(0.00)	(0.00)	–							
CPI	−0.027	−0.151	*−0.334***	1.000						
	(0.81)	(0.18)	*(0.00)*	–						
EDL	*0.467****	*0.442****	*0.401****	0.481***	1.000					
	(0.00)	*(0.00)*	*(0.00)*	(0.00)	–					
EDI	−0.121	*−0.269***	*−0.256***	−0.078	−0.350***	1.000				
	(0.29)	*(0.02)*	*(0.02)*	(0.49)	(0.00)	–				
OCI	−0.093	−0.117	*−0.325****	0.733***	0.256**	0.242**	1.000			
	(0.41)	(0.30)	*(0.00)*	(0.00)	(0.02)	(0.03)	–			
SRI	−0.059	−0.105	*−0.281***	0.634***	0.110	0.472***	0.850***	1.000		
	(0.61)	(0.35)	*(0.01)*	(0.00)	(0.33)	(0.00)	(0.00)	–		
PMI	0.037	−0.041	*−0.239***	0.829***	0.484***	0.266**	0.893***	0.835***	1.000	
	(0.74)	(0.71)	*(0.03)*	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	–	
SSA	0.001	0.112	−0.052	0.035	0.071	−0.114	0.272**	0.069	0.319***	1.000
	(0.99)	(0.32)	(0.64)	(0.75)	(0.53)	(0.31)	(0.01)	(0.54)	(0.00)	–

Note(s): *P*-value is reported in parenthesis. ***, ** and *represent statistical significance at the 1%, 5 and 10%, respectively
Source(s): Author's computation

Variables	ATM	BAP	BBP	CPI	EDL	EDI	OCI	SRI	PMI	SSA
ATM	1.000									
	–									
BAP	0.594***	1.000								
	(0.00)	–								
BBP	0.168*	0.104	1.000							
	(0.10)	(0.31)	–							
CPI	*0.521***	*0.311***	*0.172**	1.000						
	(0.00)	*(0.00)*	*(0.09)*	–						
EDL	*0.488***	*0.614***	−0.166	0.364***	1.000					
	(0.00)	*(0.00)*	(0.11)	(0.00)	–					
EDI	*0.429***	*0.352***	*0.260**	0.546***	0.160	1.000				
	(0.00)	*(0.00)*	*(0.01)*	(0.00)	(0.11)	–				
OCI	*0.298***	*0.244***	0.079	0.911***	0.345***	0.443***	1.000			
	(0.00)	*(0.02)*	(0.44)	(0.00)	(0.00)	(0.00)	–			
SRI	*0.325***	*0.299***	0.151	0.772***	0.292***	0.697***	0.751***	1.000		
	(0.00)	*(0.00)*	(0.14)	(0.00)	(0.00)	(0.00)	(0.00)	–		
PMI	*0.554***	*0.535***	0.151	0.841***	0.604***	0.757***	0.810***	0.823***	1.000	
	(0.00)	*(0.00)*	(0.13)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	–	
SSA	*0.228***	*0.398***	0.158	−0.013	0.352***	0.267**	0.028	−0.023	0.377***	1.000
	(0.02)	*(0.00)*	(0.12)	(0.90)	(0.00)	(0.01)	(0.78)	(0.82)	(0.00)	–

Note(s): *P*-value is reported in parenthesis. ***, ** and *represent statistical significance at the 1%, 5 and 10%, respectively
Source(s): Author's computation

Table 5.
Pearson correlation matrix (Asian countries correlation matrix)

Table 6.
Pearson correlation matrix (European countries matrix)

Variables	ATM	BAP	BBP	CPI	EDL	EDI	OCI	SRI	PMI	SSA
ATM	1.000									
	–									
BAP	0.387**	1.000								
	(0.02)	–								
BBP	−0.815***	−0.619***	1.000							
	(0.00)	(0.00)	–							
CPI	*0.492***	−0.143	−0.245	1.000						
	(0.00)	(0.41)	(0.14)	–						
EDL	*−0.390***	*−0.461****	0.264	−0.351**	1.000					
	(0.02)	*(0.00)*	(0.11)	(0.03)	–					
EDI	−0.201	−0.249	0.206	−0.491***	0.680***	1.000				
	(0.24)	(0.14)	(0.22)	(0.00)	(0.00)	–				
OCI	0.212	*−0.638****	0.072	0.431***	0.489***	0.415**	1.000			
	(0.21)	*(0.00)*	(0.67)	(0.00)	(0.00)	(0.01)	–			
SRI	−0.216	*−0.298**	*0.386***	−0.451***	0.375**	0.667***	0.271	1.000		
	(0.21)	*(0.07)*	*(0.02)*	(0.00)	(0.02)	(0.00)	(0.11)	–		
PMI	−0.263	*−0.708****	*0.453****	−0.055	0.751***	0.782***	0.788***	0.624***	1.000	
	(0.12)	*(0.00)*	*(0.00)*	(0.75)	(0.00)	(0.00)	(0.00)	(0.00)	–	
SSA	−0.239	−0.189	*0.508****	0.224	−0.637***	−0.365**	−0.256	−0.0001	−0.182	1.000
	(0.16)	(0.27)	*(0.00)*	(0.18)	(0.00)	(0.02)	(0.13)	(1.00)	(0.28)	–

Note(s): *P*-value is reported in parenthesis. ***, ** and *represent statistical significance at the 1%, 5 and 10%, respectively
Source(s): Author's computation

greater minority shareholder protection (PMI) and greater corporate disclosure of related-party transactions (EDI) are significantly correlated with fewer bank accounts with commercial banks (BAP) and decrease in ATM supply (ATM).

In contrast, the BBP financial inclusion variable has a significant positive correlation with the SRI, PMI and SSA corporate governance variables. The CPI variable is also significant and positively correlated with ATM financial inclusion variable. The implication is that strong ownership and control (OCI), greater shareholders' right (SRI), greater minority shareholder protection (PMI), greater ease of shareholder suits against the firm (SSA) and greater corporate transparency (CPI) are significantly correlated with greater financial inclusion in terms of higher number of bank branches. The implication of the correlation result is that better corporate governance may be positively or negatively associated with financial inclusion outcomes in European countries depending on the indicators of financial inclusion and corporate governance used.

4.5 North American countries: correlation analysis

The North American countries sample correlation result, reported in Table 7, shows evidence of a positive and negative correlation between the financial inclusion variables and the corporate governance variables. There is a significant positive correlation between the ATM financial inclusion variable and the EDL, OCI and PMI corporate governance variables. There is also a significant positive correlation between the BAP financial inclusion variable and the OCI, SRI and PMI corporate governance variables. Furthermore, there is a significant positive correlation between the BBP financial inclusion variable and the EDL corporate governance variable. This implies that greater ownership and control, greater director liability, greater shareholders' rights, greater minority shareholder protection are associated with better financial inclusion in terms of higher number of bank accounts with commercial banks and higher ATM supply in North American countries.

In contrast, there is a significant negative correlation between the ATM financial inclusion variable and the SSA corporate governance variable. There is also a significant negative correlation between the BBP financial inclusion variable and the CPI, SRI and SSA corporate governance variables. This implies that greater ease of shareholder suits against the firm, greater corporate transparency and greater shareholders' right are associated with lower financial inclusion in terms of decrease in ATM supply and fewer number of bank branches in North American countries. The implication of the correlation result is that better corporate governance may be positively or negatively correlated with financial inclusion outcomes in North American countries depending on the indicators of financial inclusion and corporate governance used.

4.6 South American countries: correlation analysis

The South America countries sample correlation result, reported in Table 8, shows evidence of a positive and negative correlation between the financial inclusion variables and the corporate governance variables. There is a significant positive correlation between the BAP financial inclusion variable and the CPI, EDI, OCI, SRI, PMI and SSA corporate governance variables. There is also a significant positive correlation between the BBP financial inclusion variable and the CPI, EDL, OCI and PMI corporate governance variables. This implies that greater corporate transparency, greater director liability, greater disclosure of related-party transactions, greater shareholders' rights and greater minority shareholder protection are associated with better financial inclusion in terms of higher number of bank accounts with commercial banks and higher number of bank branches in South American countries. In contrast, there is a significant negative correlation between the BBP financial inclusion variable and the SSA corporate governance variable. This implies that greater ease of shareholder suits against the firm (SSA) is inversely associated with financial inclusion in

Table 7.
Pearson correlation matrix (North American countries correlation matrix)

Variables	ATM	BAP	BBP	CPI	EDL	EDI	OCI	SRI	PMI	SSA
ATM	1.000									
	–									
BAP	0.740***	1.000								
	(0.00)	–								
BBP	0.585**	0.034	1.000							
	(0.01)	(0.89)	–							
CPI	−0.308	0.190	*−0.848****	1.000						
	(0.21)	(0.45)	*(0.00)*	–						
EDL	*0.724****	0.272	*0.915****	−0.866***	1.000					
	(0.00)	(0.27)	*(0.00)*	(0.00)	–					
EDI	0.102	0.279	−0.170	0.000	0.000	1.000				
	(0.68)	(0.26)	(0.49)	(1.00)	(1.00)	–				
OCI	*0.860****	*0.892****	0.236	0.142	0.371	0.000	1.000			
	(0.00)	*(0.00)*	(0.34)	(0.57)	(0.12)	(1.00)	–			
SRI	0.034	*0.449**	*−0.617****	0.916***	−0.610**	−0.161	0.493**	1.000		
	(0.89)	*(0.06)*	*(0.00)*	(0.00)	(0.01)	(0.52)	(0.03)	–		
PMI	*0.501***	*0.811****	−0.257	0.441*	−0.069	0.643***	0.682***	0.529**	1.000	
	(0.03)	*(0.00)*	(0.30)	(0.06)	(0.78)	(0.00)	(0.00)	(0.02)	–	
SSA	*−0.521***	−0.300	*−0.456**	0.118	−0.411*	0.777***	−0.593***	−0.242	0.166	1.000
	(0.02)	(0.22)	*(0.05)*	(0.63)	(0.09)	(0.00)	(0.00)	(0.33)	(0.51)	–

Note(s): *P*-value is reported in parenthesis. ***, ** and * represent statistical significance at the 1%, 5 and 10%, respectively
Source(s): Author's computation

Table 8.
Pearson correlation matrix (South American countries correlation matrix)

Variables	ATM	BAP	BBP	CPI	EDL	EDI	OCI	SRI	PMI	SSA
ATM	1.000									
	–									
BAP	0.048	1.000								
	(0.75)	–								
BBP	0.077	0.1469	1.000							
	(0.62)	(0.35)	–							
CPI	0.224	*0.406****	*0.582****	1.000						
	(0.15)	*(0.00)*	*(0.00)*	–						
EDL	0.198	−0.065	*0.444****	0.364**	1.000					
	(0.21)	(0.68)	*(0.00)*	(0.01)	–					
EDI	−0.002	*0.365***	0.004	0.614***	0.192	1.000				
	(0.98)	*(0.01)*	(0.97)	(0.00)	(0.22)	–				
OCI	−0.165	*0.689****	*0.583****	0.780***	0.229	0.459***	1.000			
	(0.29)	*(0.00)*	*(0.00)*	(0.00)	(0.14)	(0.00)	–			
SRI	0.021	*0.367***	0.093	0.719***	0.028	0.357**	0.645***	1.000		
	(0.89)	*(0.02)*	(0.55)	(0.00)	(0.85)	(0.02)	(0.00)	–		
PMI	0.043	*0.594****	*0.397****	0.906***	0.404***	0.756***	0.865***	0.724****	1.000	
	(0.78)	*(0.00)*	*(0.00)*	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	–	
SSA	−0.138	*0.601****	*−0.349***	−0.374**	−0.279*	0.101	0.002	−0.335**	−0.078	1.000
	(0.38)	*(0.00)*	*(0.02)*	(0.01)	(0.07)	(0.52)	(0.98)	(0.03)	(0.62)	–

Note(s): *P*-value is reported in parenthesis. ***, ** and *represent statistical significance at the 1%, 5 and 10%, respectively
Source(s): Author's computation

terms of a decrease in the number of bank branches. The implication of the correlation result is that better corporate governance may be positively or negatively correlated with financial inclusion outcomes in South American countries depending on the indicators of financial inclusion and corporate governance used.

4.7 Middle East and North Africa (MENA) countries: correlation analysis

The MENA countries sample correlation result, reported in Table 9, shows evidence of a positive and negative correlation between the financial inclusion variables and the corporate governance variables. There is a significant positive correlation between the ATM financial inclusion variable and the CPI, EDI, OCI, SRI, PMI and SSA corporate governance variables. There is also a significant positive correlation between the BAP financial inclusion variable and the CPI, EDL, OCI and PMI corporate governance variables. Furthermore, there is a significant positive correlation between the BBP financial inclusion variable and the EDI and SSA corporate governance variables. This implies that greater corporate transparency, greater director liability, greater ownership and control, greater disclosure of related-party transactions, greater shareholders' rights, greater minority shareholder protection and greater ease of shareholder suits against the firm (SSA) are associated with better financial inclusion outcomes in terms of number of higher numbers of bank accounts with commercial banks, higher ATM supply and higher number of bank branches in the MENA countries.

In contrast, there is a significant negative correlation between the BBP financial inclusion variable and the EDL corporate governance variable. This implies that greater director liability is inversely associated with financial inclusion in terms of number of bank branches in MENA countries. The implication of the correlation result is that better corporate governance may be positively or negatively correlated with financial inclusion outcomes in MENA countries.

4.8 Middle East countries: correlation analysis

The Middle East countries sample correlation result, reported in Table 10, shows evidence of a significant positive correlation between the financial inclusion variables and the corporate governance variables. The CPI, EDL, PMI and SSA corporate governance variables have a significant positive correlation with the ATM and BAP financial inclusion variables (i.e. the ATM and BAP variables). Also, the CPI, EDI, PMI and SSA corporate governance variables are significant and positively correlated with the BBP financial inclusion variable. This indicates that greater corporate transparency (CPI), greater director liability (EDL), greater corporate disclosure of third-party related transactions (EDI), greater ease of shareholders' suit (SSA) and greater minority shareholder protection (PMI) are significantly correlated with higher bank accounts with commercial banks (BAP), higher ATM supply (ATM) and higher number of bank branches in Middle East countries. The implication of the correlation result is that better corporate governance is associated with better financial inclusion outcomes in terms of the number of bank accounts, ATM supply and large number of bank branches in Middle East countries.

4.9 Granger causality

Table 11 reports evidence of uni-directional granger causality between the corporate governance and financial inclusion variables. The results show that there is uni-directional causality running from SRI to ATM and from PMI to ATM, indicating that the extent of shareholders right and minority investors protection causes changes in the level of financial inclusion in terms of ATM supply. There is also uni-directional causality between financial inclusion and corporate governance running from BBP to CPI, indicating that the number of

Variables	ATM	BAP	BBP	CPI	EDL	EDI	OCI	SRI	PMI	SSA
ATM	1.000									
	–									
BAP	0.555***	1.000								
	(0.00)	–								
BBP	−0.041	−0.289	1.000							
	(0.82)	(0.12)	–							
CPI	*0.682***	*0.898***	−0.039	1.000						
	(0.00)	*(0.00)*	(0.83)	–						
EDL	*0.715***	*0.858***	*−0.329**	0.846***	1.000					
	(0.00)	*(0.00)*	*(0.07)*	(0.00)	–					
EDI	0.005	−0.277	*0.422***	−0.047	−0.124	1.000				
	(0.97)	(0.13)	*(0.02)*	(0.80)	(0.51)	–				
OCI	*0.512***	*0.877***	−0.287	0.891***	0.827***	−0.277	1.000			
	(0.00)	*(0.00)*	(0.12)	(0.00)	(0.00)	(0.13)	–			
SRI	*0.474***	−0.054	−0.202	0.146	0.188	0.569***	0.003	1.000		
	(0.00)	(0.77)	(0.28)	(0.43)	(0.31)	(0.00)	(0.98)	–		
PMI	*0.792***	*0.683***	0.064	0.867***	0.821***	0.354*	0.671***	0.491***	1.000	
	(0.00)	*(0.00)*	(0.73)	(0.00)	(0.00)	(0.05)	(0.00)	(0.00)	–	
SSA	*0.741***	0.242	*0.579***	0.519***	0.338*	0.424**	0.161	0.397**	0.721***	1.000
	(0.00)	(0.19)	*(0.00)*	(0.00)	(0.06)	(0.01)	(0.39)	(0.03)	(0.00)	–

Note(s): *P*-value is reported in parenthesis. ***, ** and *represent statistical significance at the 1%, 5 and 10%, respectively
Source(s): Author's computation

Table 9.
Pearson correlation matrix (MENA countries correlation matrix)

Table 10.
Pearson correlation matrix (Middle East countries correlation matrix)

Variables	ATM	BAP	BBP	CPI	EDL	EDI	OCI	SRI	PMI	SSA
ATM	1.000									
	–									
BAP	0.769***	1.000								
	(0.00)	–								
BBP	0.133	0.309**	1.000							
	(0.31)	(0.02)	–							
CPI	*0.405***	*0.213**	*0.227**	1.000						
	(0.00)	*(0.10)*	*(0.08)*	–						
EDL	*0.678***	*0.611****	−0.114	0.546***	1.000					
	(0.00)	*(0.00)*	(0.38)	(0.00)	–					
EDI	0.151	−0.006	*0.394****	0.326**	0.106	1.000				
	(0.25)	(0.96)	*(0.00)*	(0.01)	(0.41)	–				
OCI	0.104	0.049	0.133	0.876***	0.507***	0.185	1.000			
	(0.42)	(0.71)	(0.31)	(0.00)	(0.00)	(0.15)	–			
SRI	0.194	−0.064	0.192	0.833***	0.297**	0.465***	0.789***	1.000000		
	(0.13)	(0.62)	(0.13)	(0.00)	(0.02)	(0.00)	(0.00)	–		
PMI	*0.474****	*0.297***	*0.274***	0.847***	0.710***	0.591***	0.797***	0.766***	1.000	
	(0.00)	*(0.02)*	*(0.03)*	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	–	
SSA	*0.259***	*0.229**	*0.367****	−0.104	0.221*	0.398***	−0.085	0.133	0.334**	1.000
	(0.04)	*(0.07)*	*(0.00)*	(0.42)	(0.08)	(0.00)	(0.51)	(0.31)	(0.01)	–

Note(s): *P*-value is reported in parenthesis. ***, ** and *represent statistical significance at the 1%, 5 and 10%, respectively
Source(s): Author's computation

Pairwise Granger causality tests Sample: 2014 2019 Lags: 2 Null hypothesis	Obs	F-statistic	*p*-value
CPI does not Granger Cause ATM	184	2.924	0.056
ATM does not Granger Cause CPI		0.812	0.445
EDL does not Granger Cause ATM	184	0.588	0.556
ATM does not Granger Cause EDL		0.188	0.828
EDI does not Granger Cause ATM	184	2.615	0.076
ATM does not Granger Cause EDI		0.051	0.949
OCI does not Granger Cause ATM	184	2.081	0.127
ATM does not Granger Cause OCI		0.862	0.423
SRI does not Granger Cause ATM	180	3.496	0.032*
ATM does not Granger Cause SRI		1.676	0.189
PMI does not Granger Cause ATM	180	3.064	0.049*
ATM does not Granger Cause PMI		0.102	0.902
SSA does not Granger Cause ATM	180	0.834	0.435
ATM does not Granger Cause SSA		0.324	0.723
CPI does not Granger Cause BAP	184	0.088	0.915
BAP does not Granger Cause CPI		0.331	0.718
EDL does not Granger Cause BAP	184	1.407	0.247
BAP does not Granger Cause EDL		0.086	0.917
EDI does not Granger Cause BAP	184	0.687	0.504
BAP does not Granger Cause EDI		0.190	0.827
OCI does not Granger Cause BAP	184	0.694	0.501
BAP does not Granger Cause OCI		1.021	0.362
SRI does not Granger Cause BAP	180	0.200	0.818
BAP does not Granger Cause SRI		0.144	0.865
PMI does not Granger Cause BAP	180	0.396	0.673
BAP does not Granger Cause PMI		0.015	0.985
SSA does not Granger Cause BAP	180	0.256	0.773
BAP does not Granger Cause SSA		0.137	0.871
CPI does not Granger Cause BBP	184	2.643	0.074
BBP does not Granger Cause CPI		7.356	0.001*
EDL does not Granger Cause BBP	184	0.697	0.499
BBP does not Granger Cause EDL		0.039	0.961
EDI does not Granger Cause BBP	184	0.438	0.645
BBP does not Granger Cause EDI		0.817	0.443
OCI does not Granger Cause BBP	184	1.546	0.215
BBP does not Granger Cause OCI		0.160	0.851
SRI does not Granger Cause BBP	180	1.076	0.342
BBP does not Granger Cause SRI		0.272	0.762
PMI does not Granger Cause BBP	180	1.405	0.248
BBP does not Granger Cause PMI		0.554	0.575
SSA does not Granger Cause BBP	180	0.188	0.828
BBP does not Granger Cause SSA		0.111	0.895

Note(s): *Denote statistical significance less than the 5% level
Source(s): Author's computation

Table 11.
Granger causality test

bank branches granger causes changes in the corporate governance environment particularly corporate transparency.

5. Conclusion

This paper investigated the association between corporate governance and financial inclusion using the method of correlation and causality test. The indicators of financial

inclusion were ATMs per 100,000 adults, bank accounts per 1,000 adults and bank branches per 100,000 adults while the indicators of corporate governance were the extent of corporate transparency index, the extent of director liability index, the extent of disclosure index, the extent of ownership and control index, the extent of shareholder rights index, minority investors protection index and the ease of shareholder suits index.

The findings showed that strong corporate governance is significantly associated with better financial inclusion outcomes. The regional analyses showed that corporate governance has a significant positive association with financial inclusion in Asian countries and in Middle East countries. However, a positive and negative association was observed between some indicators of corporate governance and financial inclusion in European countries, North American countries, South American countries, African countries and MENA countries, implying that strong corporate governance has a positive and negative correlation with financial inclusion depending on the indicators of corporate governance and financial inclusion used. There is also evidence of uni-directional granger causality between corporate governance and financial inclusion.

The results showing a positive association between corporate governance and financial inclusion emphasize the need for countries to develop a strong corporate governance environment – one that protect shareholders and hold directors liable and accountable for their corporate decisions in governing the firm. In such environments, financial sector regulators and policy makers should develop robust corporate governance frameworks that allow employees, outsiders and shareholders to hold financial institutions accountable to fulfill their obligation towards financial inclusion. Such frameworks should impose penalties on financial institutions if they fail to fulfill their obligation towards financial inclusion. Such policy frameworks would be needed in developing countries where financial institutions and Bigtech firms engage in financial inclusion washing.

Future studies can re-examine the association between corporate governance and financial inclusion using other empirical methods of causation. Future studies can also examine the effect of corporate sustainability on financial inclusion. Future studies can also examine the effect of corporate governance on social inclusion since financial inclusion and social inclusion are intertwined as documented in Ozili (2020). Future studies can also re-examine the association between corporate governance and financial inclusion at the firm-level.

References

Ali, H.S., Law, S.H., Yusop, Z. and Chin, L. (2016), *Institutional Quality and Financial Inclusion Nexus in Developing Countries: A Dynamic Panel GMM Estimation Analysis*, IBAF, Malaysia.

Ali, M., Nazir, M.I., Hashmi, S.H. and Ullah, W. (2022), "Financial inclusion, institutional quality and financial development: empirical evidence from OIC countries", *The Singapore Economic Review*, Vol. 67 No. 01, pp. 161-188.

Bozkurt, İ., Karakuş, R. and Yildiz, M. (2018), "Spatial determinants of financial inclusion over time", *Journal of International Development*, Vol. 30 No. 8, pp. 1474-1504.

Eldomiaty, T., Hammam, R. and El Bakry, R. (2020), "Institutional determinants of financial inclusion: evidence from world economies", *International Journal of Development Issues*, Vol. 19 No. 2, pp. 217-228.

Kumar, N. (2013), "Financial inclusion and its determinants: evidence from India", *Journal of Financial Economic Policy*, Vol. 5 No. 1, pp. 4-19.

Lachebeb, Z., Ismail, N.W., Ahmad, M.N.N. and Slesman, L. (2021), "The nonlinear impact of political institutional quality on financial inclusion", *Institutions and Economies*, Vol. 13 No. 2, pp. 1-25.

Marnet, O. (2005), "Behavior and rationality in corporate governance", *Journal of Economic Issues*, Vol. 39 No. 3, pp. 613-632.

Mousa, R. and Ozili, P.K. (2022), "Reimagining financial inclusion in the post COVID-19 world: the case of Grameen America", *International Journal of Ethics and Systems*, (ahead-of-print).

Muriu, P.W. (2021), "Does the quality of institutions matter for financial inclusion? Cross country evidence", *International Journal of Economics and Finance*, Vol. 13 No. 7, pp. 1-27.

Nkoa, B.E.O. and Song, J.S. (2020), "Does institutional quality affect financial inclusion in Africa? A panel data analysis", *Economic Systems*, Vol. 44 No. 4, 100836.

Ozili, P.K. (2018), "Impact of digital finance on financial inclusion and stability", *Borsa Istanbul Review*, Vol. 18 No. 4, pp. 329-340.

Ozili, P.K. (2020), "Social inclusion and financial inclusion: international evidence", *International Journal of Development Issues*, Vol. 19 No. 2, pp. 169-186.

Ozili, P.K. (2021a), "Financial inclusion research around the world: a review", *Forum for Social Economics*, Vol. 50 No. 4, pp. 457-479.

Ozili, P.K. (2021b), "Financial inclusion in Nigeria: determinants, challenges, and achievements", in Özen, E., Grima, S. and Gonzi, R.D. (Eds), *New Challenges for Future Sustainability and Wellbeing (Emerald Studies in Finance, Insurance, and Risk Management)*, Emerald Publishing, Bingley, pp. 377-395.

Singh, K., Misra, M. and Yadav, J. (2021), "Corporate social responsibility and financial inclusion: evaluating the moderating effect of income", *Managerial and Decision Economics*, Vol. 42 No. 5, pp. 1263-1274.

Soumare, I., Tchana Tchana, F. and Kengne, T.M. (2016), "Analysis of the determinants of financial inclusion in central and West Africa", *Transnational Corporations Review*, Vol. 8 No. 4, pp. 231-249.

Vo, D.H., Tran, N.P., Hoang, H.T.T. and Van, L.T.H. (2021), "Do corporate social responsibility and bank performance matter for financial inclusion in Vietnam?", *Journal of Asia Business Studies*, Vol. 16 No. 4, pp. 639-651.

Zulkhibri, M. and Ghazal, R. (2017), "The impacts of governance and institution on financial inclusion: evidence from Muslim countries and developing economies", *Journal of King Abdulaziz University: Islamic Economics*, Vol. 30 No. 3, pp. 37-60.

Corresponding author
Peterson K. Ozili can be contacted at: petersonkitakogelu@yahoo.com