Impact of Sustainable Finance on the Firm Performance: A Study on the Pakistani Banking Sector

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Abstract: Sustainable finance and the adoption of sustainable financial practices in regular business activities is an important matter of consideration in the current global environment. The current study examines the repercussion of economic sustainability, social sustainability, environmental sustainability and combined sustainable finance on firm performance in the banking industry of Pakistan. To analyze, secondary data was collected from the consolidated financial statement of 20 public and private banks for the period 2010 to 2020. ROA, ROE and EPS are three measurements of firm performance. The data is analyzed by using STATA by applying ARDL, Unit root test, Hausman test, Random effect, and fixed effect. Economic sustainability has a positive significant, social sustainability has a negative significance and environmental sustainability has an insignificant effect on the firm performance while the combined scores of sustainable finance prove the dispersed impact on firm performance.

Key Words: Sustainable Finance, Firm Performance, Economic sustainability, social sustainability, environmental sustainability

1. Introduction

Most of the financial models were established in the era of resource richness i.e. when plenty of natural reserves was available whereas environmental challenges were very low. Labour and capital were considered major resources while environmental factors were ignored in these models (Daly and Farley, 2011). Likewise, the financial theory was based on the short-term cash flows generated through these natural resources. Perhaps fatal depletion of natural resources and their environmental impact is ignored, industrial production and competition are also pushing the universe towards an unhealthy natural environment and reduction of natural resources and environmental issues are becoming the utmost challenging ecological constraint (Stern, 2008). Physical risks associated with these models, such as environmental challenges and extreme weather-related events, can not only

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damage property, land, and infrastructure, but can also affect human existence. These models are currently extensively used, but no longer acceptable because the current economic models are striving to low carbon and natural resources to overwhelm environmental challenges. For businesses, this reduces asset values and ultimately reduces the profitability, damages public investment and increases the cost of settlement for underwriting losses by the insurance companies. In a broader, scenario it will damage the macroeconomic environment by reducing output and productivity. Along with environmental risk, there is a social risk such as long working hours, underpayment and child labour result from mass production in this competitive economic system that is firstly faced by the developed world and later moved to the developing economies (Schoenmaker, 2018). To encounter these social challenges, some social regulations are now promoted to monitor working conditions, encourage a healthy working environment and provide healthcare and basic facilities of life in the society.

Poverty, hunger, lack of basic healthcare facilities and a lower rate of literacy are alarming signals that most people, especially in the developing and underdeveloped countries, live below minimum social standards (Schoenmaker, 2018). Besides these social challenges, communities and businesses around the world are facing extensive environmental degradation on many fronts, with signs that the world about to reach the several alarming tipping points, especially in excessive water stress, air pollution and ecological destruction that destabilizes our ecosystems and threatens human civilization, while progress towards a circular economy remains disjointed and inconsistent. As 15th Global Risks Report issued in January 2020 by the World Economic Forum (WEF) published that environmental and climate change are rated the top long term global threat (Franco, 2020). Social, environmental and climate risks is getting alarming, that can cause biodiversity loss for the current generation and can create a big problem for the future existence of human life. Sustainable development is the only solution that means the current and future generations should have the availability of necessities of life they require surviving, such as food, water, health facilities, education, energy resources, and healthy air quality without disturbing the natural environment (Raworth, 2017). According to Stoddart et al. (2011), sustainability is the efficient and justifiable allocation of natural resources to intra-generation and inter-generation.

Finance is grease to run the economy (Scholtens, 2006) the key role of finance is to allocate its funds to its most productive users and therefore can contribute towards strategic decision making by the tradeoff among sustainable goals while at a wider level can contribute to organization's strategy on achieving sustainable goals (Schoenmaker & Schramade, 2018). Finance can influence the environment and social responsibility of businesses (Scholtens, 2006). The importance of finance can be monitored because it is a key factor of production, so the financial resources must be utilized to attain sustainable development. Traditional finance concentrates on monetary reward and risk while sustainable finance focuses on economic, social and environmental benefits collectively (Falcone and Sica, 2019). The allocation of financial resources in the production of different products and provision of multiple services in such methods that protect or at least not damage financial return, the ecological existence and societal welfare (International Finance Corporation, IFC 2007). According to Migliorelli (2021), advancements in policy and procedure designs enforced sustainable finance to provide adequate financial resources for the transformation of a responsible society and an environmental friendly economy.

Sustainable finance has acquired special attention across the Asian region (Volz 2019) because financial regulatory authorities are focusing to develop social and environmental policies and assist their financial sector to incorporate economic, environmental and social standards during financing and investment activities (Durrani, Rosmin & Volz, 2020).

1.1 Sustainable Finance in broader Policy Framework

Sustainable finance has gained special attention in the financial sector around the globe. For this purpose, Central bank as well as financial administrators can contribute by gradually incorporating the climate mitigate risks and sustainable finance policies (Dikau and Volz 2021). To practically implement these policies, Network for green the financial system (NGFS), which is the organization of the central bank and the sustainable banks network (SBN) is an association of financial institutions is the evidence of the importance of sustainable finance. NGFS was established by 8 central banks in 2017 and 208 central banks established NGFS19 consisting of 54 members (NGFS annual report, 2019). NGFS is an independent, consensus centred forum whose motive is to promote best practices, take part in the management of environment-related risk in the financial institution and mobilize funds to incorporate the evolution of a sustainable economy (Durrani, Rosmin & Volz, 2020).

United Nations has established the Sustainable Development agenda 2030 to promote sustainable and comprehensive economic development and in this regard the role of central banks is to develop sustainable financial strategies to accomplish the sustainable development goals/ SDG (Durrani, Rosmin & Volz, 2020). These SDG are the benchmark of the obligation of the worldwide community to promote a sustainable society and a sustainable environment (Migliorelli, 2021). To achieve these objectives, initiatives have been taken to establish strong policies worldwide to mainstream the flow of financial resources directed towards sustainability goal.

1.2 Problem Statement

Pakistan is an emerging market and the financial performance of businesses is compulsory for the financial and economic development of the Pakistan. So an effort has been put to find the role of sustainable finance in firm performance.

1.3 Research Question

The present empirical study is going to conduct to find the solution to the following problems.

What is the role of economic sustainability in improving the financial performance of the banking industry?

What is the role of social sustainability in improving the financial performance of the banking sector?

What is the role of environmental sustainability in improving the financial performance of the banking industry?

What is the role of sustainable finance in improving the financial performance of the banking industry?

1.4 Research aims

The research objectives are:

1. To explore the association between economic sustainability and firm performance.
2. To explore the association between social sustainability and firm performance.
3. To explore the association between sustainability and firm performance.
4. To explore the association between sustainable finance and firm performance.

2. Literature Review

2.1 Sustainable Finance

Sustainable finance is the financial system that incorporates sustainability practices into their investment activities, to achieve healthy environmental and social conditions without compromising the economic benefits (Migliorelli,2021). Sustainable finance is the combination of economic sustainability, social sustainability, and environmental sustainability (Schoenmaker & Schramade, 2018). Moreover, sustainable businesses use sustainable financial practices that are the integration of a prosperous economy, responsible society and biodegradable environment (Tur-Porcar, RoigTierno, and Mestre 2018). Thus sustainable finance contributes to eThus,very activity of each financial sector for the achievement and development of sustainability dimensions (Migliorelli,2021). Thus economic sustainability, environmental eco-friendly and social responsibility are three dimensions of organizational sustainability (Soto-Acosta2016), and these three interrelated and interdependent pillars of sustainable finance are economies, society and the environment, ignoring one of these pillars will lead to macro-economic instability, global social crises and climate change (Nyachanchu & Cheruiyot, 2017).

According to stakeholder theory, organizations are accountable for a large number of stakeholders instead of a limited number of shareholders (Freeman, 1984). It is the organizational obligation to treat all the stakeholders fairly, and organization-stakeholders relations can be strengthened by sustainable corporations (Aggarwal, 2013).

2.2 Economic dimension

The economic dimension of sustainable finance monitors the impact of the organizational practices on the financial stability of stakeholders and overall economic conditions at national as well as international levels (Tawfik, Kamar and Bilal 2021).

2.3 Social dimension

The social dimension of sustainable finance examines how a company manages it's supply chain and builds its relationships with its stakeholders, specifically with its consumers, personnel, suppliers and the overall society where it operates. In this regards, the people are now conscious of all the social activities of the business and they are keenly monitoring the trade of illegal weapon, violation of civil rights, gambling, labor law violations, working environment, child labor, exploitation of employees by poor salaries and harsh working hours, gender discrimination, without pay maternity and sick leave (Kuhn, 2020). Thus, social sustainability refers to the procedure that confirms the well-being and societal conditions of all the stakeholders of businesses (Florea, Cheung, Herndon, 2013)

2.4 Environment Dimension

The environmental dimension of sustainable finance stresses environmental protection and the reason is to protect the natural environment not only for the current generation but for the needs of future generations (Tur-Porcar, Roig Tierno, and Mestre 2018). Global Reporting Initiative (GRI, 2011), defines the environmental dimension of sustainability as it is conscious of the impact of organization activities on living as well as nonliving natural systems, which include air, water, soil and ecosystem. Environmental Sustainability is considered the need of the time even it can influence the overall profitability of an organization because currently the organizations are accountable for the influence of their operations on the global environment and are responsible to disclose all such activities in their annual and sustainability reports (Aggarwal, 2013). Schaltegger and Synnestvedt (2002) claimed that no practical legislation and system exits in the world that check the association between environmental and financial performance, this relationship can be proved true for particular cases in which the environmental regulations offer an attractive financial benefit to businesses for making continuous developments in their business activities.

2.5 Firm performance

Firm performance is the capability of a business to effectively use its resources in such a way to generate operational and financial results (Taouab & Issor, 2019). In the decade of the 21st century, the company performance is based upon the efficient use of resources the company that helps to consistently improve competencies and capabilities to achieve company goals (Taouab & Issor, 2019). Bartuševičienė & Šakalytė (2013) defines firm performance as the combination of effectiveness and efficiency at the same time as the efficiency is the profitable transformation of input into output and effectiveness is the interaction of output with economic and social development. Siepel & Dejardin (2020), define a firm's performance as its ability to acquire the opportunity to maximize its profits. Coad et al. (2017) declare profit as the driving force towards future growth and there are multiple ways to measure profit but the most widely used measure is through financial ratios reported in the financial statement of the firm for example return on asset, earning per share, return on equity, etc.

2.6 Hypothesis Development

Diamastuti et al. (2021) claimed that firms must not only strive to achieve the rights of their shareholder but the interest of the entire society. For this purpose, business organizations have to trade-off between social obligation and financial outcomes. Profit maximization by a firm ensures the higher shareholder value of the firm is normally considered the ultimate aim, but to achieve this goal businesses often indulge to violate the corporate regulations, damaging the ecological system and environment and keep the employee safety at stake (Skouloudis et al., 2019). According to Tawfik, Kamar & Bilal (2021), businesses have to scarify their profit for their socially responsible activities. Brammer et al. (2006) empirically test that social performance is negatively related to financial performance of the corporations. Meanwhile, López et al. (2007) empirically confirm that firm social performance and firm financial performance are negatively correlated with each other. White and Kiernan (2004) empirically confirm that improved environmental performance is associated with the sped up financial performance of businesses. Empirical evidence from previous studies confirms that there are differences in the result, like the outcomes of the study by Jyoti & Khanna, (2021) empirically confirm the negative correlation between sustainable combined scores performance and firm performance. Nobanee and Ellili (2017) evaluate that economic, social and environmental sustainability performance has no significant association with the financial performance of all the banking sectors, both conventional and Islamic in UAE.

2.7 Hypotheses

The following hypothesis has been developed to check the relationship between the variables.

H1a. Economic sustainability has a significant association with ROA.

H1b. Economic sustainability has a significant association with ROE.

H1c. Economic sustainability has a significant association with EPS.

H2a. Social sustainability has a significant association with ROA.

H2b. Social sustainability has a significant association with ROE.

H2c. Social sustainability has a significant association with EPS.

H3a. Environmental sustainability has a significant association with ROA.

H3b. Environmental sustainability has a significant association with ROE

H3c. Environmental sustainability has a significant association with EPS.

H4a. Sustainable finance has a significant association with ROA.

H4b. Sustainable finance has a significant association with ROE.

H4c. Sustainable finance has a significant association with EPS.
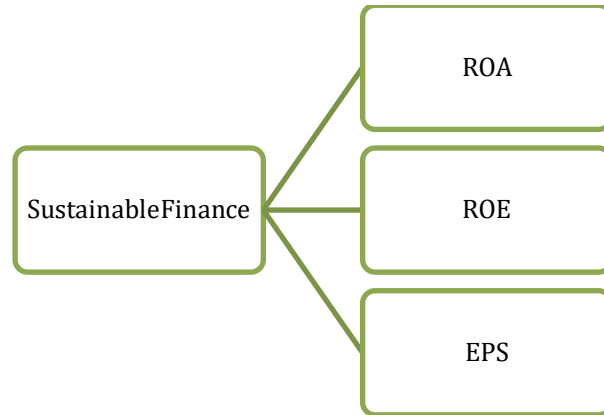
3. Research Methodology
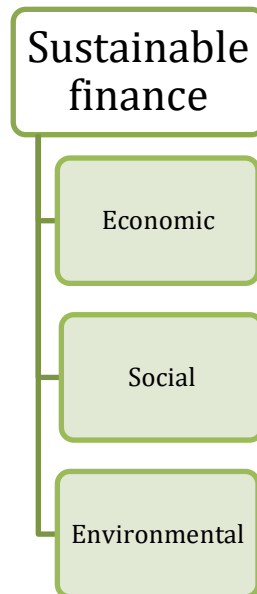

Figure 1: Theoretical Model

Figure 2: Dimensions of Sustainable Finance

4. Research Framework

4.1 Sample Selection and Study Period

The banking sector in the emerging economies is considered the financial service sector, and that is the major reason that the banking sector is at the forefront of implementing sustainable finance practices (Kariuki, 2015). Moreover, due to informational accessibility, financial institutions can contribute a leading role in evaluating economic, social, environmental obligations of its customer and as instrumental agents can pursue their clients for higher performance standards (Urban & Wójcik, 2019). Legislative and regulatory authorities demand from policymakers to develop their products and services that meet the standard of sustainable finance (Azevedo, Godina & Matias, 2017). The current study sample comprises from 2010 to 2020 (11 years) from 20 public and private banks in Pakistan.

4.2 Measures of Variables of the Study

4.2.1 Independent Variable

Economic sustainability is measured by the economic indicators of the banks that are related to the economic benefit generated by the businesses such that including economic benefit generated (earnings before interest and taxes, earnings after taxes), economic benefit distributed (operating cost, income tax, employees' salaries and wages) and market development (number of branches, number of ATM). Social sustainability is calculated by the social indicators that are for human well-being such that employment (total number of permanent and temporary employees) and corporate social contribution (donations). The environmental indicators are directly or indirectly associated with the natural environment and contain material (paper and printing) and energy consumption (fuel cost) measured environmental sustainability. Grey Relational Analysis (GRA) is the method used to calculate the economic sustainability, social sustainability, environmental sustainability and combined scores of sustainable finance (Özçelik & AVCI ÖZTÜRK, 2014).

4.2.2 Dependent Variables

The financial performance of the business organization can be measured by two methods, named as accounting-based measure and market-based measure. In the current study accounting-based measures are applied because these are derived from the audited financial statements and these are considered to be most credible, authentic, and widely acceptable and are not affected by market speculation or investors' perceptions and hence can be considered as more reliable in profitability and market prices of shares (Lopez et al., 2007). Return on asset (ROA), return on equity (ROE) and earning per share (EPS) are widely applied accounting-based techniques to measure the firm accounting performance (Azevedo & Earnhart, 2010; Tang et al., 2012).

$$\text{ROA} = \frac{Net\ income\ after\ interest\ and\ tax}{total\ Asset}$$

$$\text{ROE} = \frac{Net\ income\ after\ interest\ and\ tax}{total\ Equity}$$

$$\text{EPS} = \frac{Net\ income\ after\ interest\ and\ tax}{.of\ shares\ of\ common\ stock\ outstanding}$$

4.2.3 Research Model

$$ROA_{it} = \beta_0 + \beta_1 Economic_{it} + \beta_2 Social_{it} + \beta_3 Environmental_{it} + \beta_4 Size_{it} + \beta_5 Leverage_{it} + \varepsilon_0 \ldots\ldots (i)$$

$$ROE_{it} = \beta_0 + \beta_1 Economic_{it} + \beta_2 Social_{it} + \beta_3 Environmental_{it} + \beta_4 Size_{it} + \beta_5 Leverage_{it} + \varepsilon_0 \ldots\ldots (ii)$$

$$EPS_{it} = \beta_0 + \beta_1 Economic_{it} + \beta_2 Social_{it} + \beta_3 Environmental_{it} + \beta_4 Size_{it} + \beta_5 Leverage_{it} + \varepsilon_0 \ldots\ldots (iii)$$

$$ROA_{it} = \beta_0 + \beta_1 Combined\ Sustainable\ Finance_{it} + \beta_2 Size_{it} + \beta_3 Leverage_{it} + \varepsilon_0 \ldots\ldots (iv)$$

$$ROE_{it} = \beta_0 + \beta_1 Combined\ Sustainable\ Finance_{it} + \beta_2 Size_{it} + \beta_3 Leverage_{it} + \varepsilon_0 \ldots\ldots (v)$$

$$EPS_{it} = \beta_0 + \beta_1 Combined\ Sustainable\ Finance_{it} + \beta_2 Size_{it} + \beta_3 Leverage_{it} + \varepsilon_0 \ldots\ldots (vi)$$

4.2.4 Data and method

Despite many international efforts have been put to evaluate the sustainable financial performance, only a few studies consider all the dimensions of sustainable finance (environmental, economic, and social) altogether and further its impact on firm performance specifically of the banking sector by using Global Reporting Initiative (GRI) (Tawfik, Kamar and Bilal 2021).

5. Results and Findings

Table 1: Summary Statistics

Variables	Observation	Mean	Std. Dev.	Min	Max
Eco. Sco	220	.5895859	.1186171	-.8988974	.7567011
Social Sco	220	.5660108	.1334452	.3333333	1
Env. Sco	220	.5676456	.2243257	-.5252545	1
Sus Finance	220	.5744141	.1036056	-.2143849	.8487437
ROA	220	1.45201	2.149122	-2.07	14.65
ROE	220	13.30338	9.906534	-34.29	34.6
EPS	220	5.689028	6.504598	-7.62	24.82
Size	220	19.81493	1.15758	14.61739	22.0711
Leverage	220	.9132236	.0407079	.7388442	.9842451

Table 1: Correlation Matrix

	ROA	ROE	EPS	Eco. Sco	Social Sco	Env. Sco	Sus Finance	Size	Leverage
ROA	1.0000								
ROE	0.2871	1.000							
	0.000								
EPS	0.1716	0.5754	1.0000						
		0.0000							
	0.0108								
Eco. Sco	0.0469	0.2390	0.0851	1.0000					
	0.4887	0.0003	0.2085						
Social Sco	-0.1882	-0.0405	0.1566	0.0354	1.0000				
	0.0051	0.5503	0.0202	0.6010					
Env. Sco	-0.0814	-0.0076	-0.0213	0.3381	-0.0786	1.0000			
	0.9113	0.7532	0.0000	0.2455					
	0.2291								
Sus Finance	-0.1216	0.0684	0.0843	0.6409	0.3861	0.8170	1.0000		
	0.0718	0.3127	0.2129	0.0000	0.0000	0.0000			
Size	0.1303	0.6519	0.7037	0.1412	0.1422	-0.1696	-0.0075	1.0000	
	0.0536	0.0000	0.0000	0.0363	0.0350	0.0117	0.9124		
Leverage	-0.1991	0.1098	-0.0702	-0.0517	0.0229	-0.2463	-0.1877	0.2934	1.0000
	0.0030	0.1043	0.3002	0.4451	0.7354	0.0002	0.0052	0.0000	

5.1 Hausman test

Fixed effect model and random effect model are two methods of panel data regression analysis, named as. To choose the most suited model for the current study, the null hypothesis is developed, H0: Random effect is appropriate, against the alternative hypothesis HA: The fixed effect model is appropriate. For this purpose, the Hausman test is applied for economic scores, social scores and environmental scores, it is evaluated that the p-value for ROA is 0.3049 (insignificant) and for ROE is 0.1718 (insignificant) which is more than 0.05 (confidence interval) and found that random effect model is more suitable. While for EPS the p-value is 0.0000 (significant) less than 0.05 which recommend that fixed effect model is appropriate. Combined scores of sustainable finance have the p-value of ROA is 0.9118 (insignificant) which recommends the random effect model, meanwhile, for ROE and EPS the p-values are 0.0560 and 0.0007 respectively, which suggests the fixed effect model.

5.2 Panel Data Regression Results

Panel data regression fixed effect and random effect model have been used to regress the dependent variable firm performance (ROA, ROE and EPS) and economic scores, social scores, environmental scores and combined sustainable finance scores as the explanatory variables. Moreover, the firm size (log of assets) and leverage ratio (total liabilities divided by total assets) as the control variables.

Table 2: Panel data regression of impact of economic scores, social scores and environmental scores on firm performance (ROA)

Random-effect GLS regression		Number of observations = 220
Group variable: name		Number of groups = 20
R-square:		Observation per group
Within = 0.1698		min = 11
Between = 0.1115		avg = 11.0
Overall = 0.1377		max = 11
		Wald chi2 (5) = 42.50
Corr(u_i, X) = 0 (assumed)		Prob > chi2 = 0.0000

ROA	Coef.	Std. err.	t	p>|t|	[95% Conf. Interval]	
Economic Scores	1.901536	.9470781	2.01	0.045	.0452974	3.757775
Social Scores	-3.924711	.8029519	-4.89	0.000	-5.498468	-2.350954
Environmental	-1.260357	.5258471	-2.40	0.017	-2.290998	-.2297157
Score	.3498643	.2043329	1.17	0.087	-.0506209	.7503495
Size						
Leverage	-11.7339	3.897289	-3.01	0.003	-19.37245	-4.095355
_Cons	7.050894	4.207411	1.68	0.094	-1.195481	15.29727

Sigma_u: 1.6347812
Sigma_e: 1.4144829
Rho: .57187122 (fraction of variance due to u_i)

Table 2 describe the values of panel data random effect regression of dependent variable, firm performance (ROA) and explanatory variables economic scores, social scores and environmental scores. The overall value of R-square is 0.1377that shows that the 13.77% distinction in firm performance is justified by the explanatory variables of the study. The p-value of all the predictors is 0.000, 0.0017 and 0.087 which is less than 0.05 (95% confidence interval) and confirms the significance of the predictors. Only the coefficient of economic scores confirms the positive significant association with the firm performance, meanwhile coefficient of the other two variables, social scores and environmental scores confirm the negative significant effect on firm performance (ROA).

Table 3: Panel data regression results of economic scores, social scores and environmental scores and firm performance (ROE)

Random-effect GLS regression		Number of observations = 220
Group variable: name		Number of groups = 20
R-square:		Observation per group

	Within = 0.1607				min = 11	
	Between = 0.6594				avg = 11.0	
	Overall = 0.4565				max = 11	

Wald chi2 (5) = 61.76

Corr(u_i, X) = 0 (assumed)   Prob > chi2   = 0.0000

ROE	Coef	Std. err	t	p>|t|	[95% Conf. Interval]	
Economic Scores	14.4392	3.837401	3.76	0.000	6.918032	21.96037
Social Scores	-6.711328	3.236211	-2.07	0.038	-13.05419	-.3684704
Environmental Score	-1.519495	2.121474	-0.72	0.474	-5.677508	2.638518
Size	3.994943	.7658475	5.22	0.000	2.493909	5.495976
Leverage	-24.85123	15.406	-1.61	0.107	-55.04645	5.343979
_Cons	-47.01334	16.39077	-2.87	0.0004	-79.13866	14.88802

Sigma_u: 5.0023272
Sigma_e: 5.7014169
Rho:.43496479 (fraction of variance due to u_i)

Table 3 reveals that a 45.65% change in firm performance is contributed by independent variables economic scores, social scores and environmental scores as the overall R-Square value is 0.4565. The null hypothesis is rejected as a p-value of economic scores, social scores are 0.000 and 0.038 which confirms the significance of the predictors of the study at a 95% level of confidence besides the acceptance of the null hypothesis because the p-value of environmental scores that is 0.474 which leads towards insignificance of the independent variable. Only the coefficient of economic scores and social scores conclude the positive and negative significant effects respectively while the coefficient of environmental scores leads towards negative and non-significant effects on firm performance.

Table 4: Panel data regression results of economic scores, social scores and environmental scores and firm performance (EPS)

Fixed-effect (within) regression   Number of observations = 220
Group variable: name   Number of groups = 20
R-square: Observation per group
          Within = 0.2402   min = 11
          Between = 0.6610   avg = 11.0
          Overall = 0.3905   max = 11
                                          F (5,195) = 12.33
Corr(u_i, Xb) = 0.4725   Prob > F   = 0.0000

EPS	Coef.	Std. err.	t	p>|t|	[95% Conf. Interval]	
Economic Scores	3.923134	1.61994	2.42	0.016	.7282817	7.117986
Social Scores	6.001601	1.390212	4.32	0.000	3.25982	8.743382
Environmental Score	-1.33369	.9082523	-1.47	0.144	-3.124949	.4575688
Size	.9722067	.4060857	2.39	0.018	.1713229	1.77309

Leverage	-15.79082	6.934229	-2.28	0.024	-29.46654	-2.115105
_Cons	-4.107565	7.703085	-0.53	0.594	-19.29962	11.08449

Sigma_u: 5.3105684
Sigma_e: 2.3411901
Rho: .83727337 (fraction of variance due to u_i)
F test that all u_i=0: F(19,195)= 8.49   Prob > F=0.0000

Table 4 describes the overall R-Square of panel data fixed effect regression model as 0.3905 revealing that the 39.05% firm performance (EPS) is caused by the economic scores, social scores and environmental scores and the p-value of these three independent variables are 0.016, 0.000 and 0.144 respectively which confirm that the economic and social scores have a significant effect while environmental scores have no significant effect on firm performance (EPS). Furthermore, both coefficients of economic scores and social scores confirm the positive significant impact and the coefficient of environmental scores has a negative insignificant effect on EPS.

Table 5: Panel data regression results of Sustainable Finance (Combined Scores) and firm performance (ROA)

Random-effect GLS regression   Number of observations = 220
Group variable: name   Number of groups = 20
R-square: Observation per group
        Within = 0.0657   min = 11
        Between = 0.1478   avg = 11.0
        Overall = 0.1062   max = 11
                                                                 Wald chi2 (5) = 16.66
Corr(u_i, X) = 0 (assumed)   Prob > chi2   = 0.0008

ROA	Coef.	Std. err.	t	p>|t|	[95% Conf. Interval]	
Sustainable Finance	-2.939919	1.018869	-2.89	0.004	-4.936864	-.942973
Size	.2776579	.1775374	1.56	0.118	-.0703091	.6256249
Leverage	-13.73255	4.049247	-3.39	0.001	-21.66893	-5.796167
_Cons	10.17985	3.937312	2.59	0.010	2.462863	17.89684

Sigma_u: 1.5192632
Sigma_e: 1.4928707
Rho: .50876139 (fraction of variance due to u_i)

Table 5 confirms that sustainable finance (combine scores) contributes 10.62% to firm performance (ROA) and the coefficient of sustainable finance negative significant effect on ROA as the coefficient has a negative value and p-value is 0.004 which is less than 0.05.

Table 6: Panel data regression results of Sustainable Finance (Combined Scores) and firm performance (ROE)

Random-effect (within) regression   Number of observations = 220

Group variable: name   Number of groups = 20

R-square: Observation per group

   Within = 0.0839   min = 11

   Between = 0.6353   avg = 11.0

   Overall = 0.4194   max = 11

                   F (3,197) = 6.01

Corr(u_i, Xb) = 0.4757   Prob > F = 0.0006

ROA	Coef.	Std. err.	t	p>|t|	[95% Conf. Interval]	
Sustainable Finance	4.177622	4.09891	1.02	0.309	-3.905752	12.261
Size	3.307751	.8211651	4.03	0.000	1.688349	4.927154
Leverage	-27.92683	17.53947	-1.59	0.113	-62.51605	6.662397
_Cons	-29.13574	16.75205	-1.74	0.084	-62.17211	3.900635

Sigma_u: 5.8264205

Sigma_e: 5.9567403

Rho: .48894152 (fraction of variance due to u_i)

F test that all u_i= 0: F (19,197) = 7.62   Prob > F= 0.0000

Table 6 represents the finding of the panel data random effect regression model that explain that 41.94% change in the firm performance (ROA) is associated with the independent variable sustainable finance (combined scores). The coefficient of sustainable finance has a positive but non-significant effect with firm performance (EPS) as the value of p is 0.309 which is more than 0.05.

Table 7: Panel data regression results of Sustainable Finance (Combined Scores) and firm performance (EPS)

Random-effect (within) regression   Number of observations = 220

Group variable: name   Number of groups = 20

R-square: Observation per group

   Within = 0.1729   min = 11

   Between = 0.6983   avg = 11.0

   Overall = 0.5685   max = 11

                   F (3,197) = 13.73

Corr(u_i, Xb) = 0.5987   Prob > F = 0.0000

EPS	Coef.	Std. err.	t	p>|t|	[95% Conf. Interval]	
Sustainable	3.690641	1.672263	2.21	0.028	.3928072	6.988475
Finance	1.954865	.3350168	5.84	0.000	1.294185	2.615544
Size	-15.91846	7.155708	-2.22	0.027	-30.03008	-1.806837
Leverage	-20.62933	6.834459	-3.02	0.003	-34.10742	-7.151234
_Cons						

Sigma_u: 4.5980552

Sigma_e: 2.4302155

Rho: .78164986 (fraction of variance due to u_i)

F test that all u_i= 0: F (19,197) = 24.30   Prob > F= 0.0000

Table 7 has overall R-Square value is 56.85% which conclude the importance of sustainable finance towards firm performance (EPS) while coefficient has positive and significant effect as p-value is 0.028 which is less than 0.05 (95% confidence interval).

Table 8 Comprehensive table of significance for the dependent and independent variables

Variables	ROA	ROE	EPS
Economic Scores	+	+	+
Social Scores	-	-	+
Environment Scores	-	Non-significant	Non-significant
Sustainable Finance	-	Non-significant	+

Table 8 describes the overall findings of this study. Economic sustainability has a positive significant impact on firm performance in all the three cases for the accounting measurement of firm performance (ROA, ROE & EPS). Social sustainability has a negative significant effect on firm performance when calculated by the formula of ROA and ROE contrary to the positive significant impact on firm performance when calculated by EPS. As already discussed, there is no direct method that exactly calculates the effect of environmental sustainability on firm performance, so the present study also confirms the negative and insignificant impact on firm performance and thus combined scores of sustainable finance confirm the dispersed results.

Table: Status of Hypothesis

Hypothesis	Status	Hypothesis	Status
H1a	Proved true	H3a	Verified true
H1b	Proved true	H3b	Verified false
H1c	Proved true	H3c	Verified false
H2a	Proved true	H4a	Verified true
H2b	Proved true	H4b	Verified false
H2c	Proved true	H4c	Verified true

5.3 The autoregressive distributed lag (ARDL)

Short term and long term dynamic interaction and co-integration between different variables are analyzed by applying autoregressive distributed lag (ARDL) that is introduced by Pesaran et al. (2001). The current study also checks the long run and short run causality among independent variables and dependent variables. For this purpose, Autoregressive Distributed Lagged Model (ARDL) is more useful to examine the impact of economic sustainability, social sustainability and environmental sustainability on firm performance. Before running the ARDL model, it is necessary to confirm that all the dependent and independent variables are stationary (have no unit root), for this purpose, unit root test is performed first. A

Stationary is defined by Brooks, (2014), as the series that has a constant mean, constant variance and there is no seasonality effect is called stationary and has no unit root. So ARDL is a flexible model to apply to a different set of variables that have different orders of integration (Pesaran, Shin & Smith, 2001). Moreover ec represent the error correction in the ARDL model that shows the adjustment speed to reinstate equilibrium facing disturbance in the dynamic model (Verma, 2007). Thus, ec represents the speed (fast/slow) with which the variable attains the equilibrium position and it must have a negative and significant value.

5.4 Unit Root Test

Variables	Difference		First Difference	
	LLC	IPS	LLC	IPS
Economic Sco.	-6.1984	1.1488	-13.3115	-3.3892
	0.8283	0.8747	0.0000	0.0004
Social Sco.	-5.3898	1.6702	-9.3028	-1.6852
	0.0211	0.9526	0.1197	0.0460
Environmental Sco	-6.7815	0.1338	-11.6813	-2.5218
	0.0035	0.5532	0.0020	0.0058
ROA	-8.1306	-2.7210	-16.4572	-5.1425
	0.0000	0.0033	0.0000	0.0000
ROE	-7.4224	-1.0229	-12.6336	-3.6359
	0.0020	0.1532	0.0000	0.0001
EPS	-0.5285	2.4307	-9.6458	-2.3242
	1.0000	0.9925	0.0210	0.0101
Size	-6.1649	1.5898	-13.8151	-4.4735
	0.0000	0.9441	0.0000	0.0000
Leverage	-6.5760	-0.0382	-11.2400	-2.3178
	0.0056	0.4848	0.0105	0.0102

Levin Lin Chu unit root test (LLC), Im-Pesaran-Shin Unit Root test (IPS)

Two methods named check the unit root, the Levin Lin Chu unit root test (LLC), and the Im-Pesaran-Shin Unit Root test (IPS). Social scores, environmental scores, ROA, ROE, size and leverage are stationary at level one and zero difference. While economic scores and EPS have a unit root at level one and zero difference, after taking the first difference, both the variable become stationary, and these are called integrated of order one (Zafar, 2020). It is a compulsory rule that all variables of study must have stationary at level one with zero or one difference (Qamruzzaman & Jianguo, 2017).

5.5 The autoregressive distributed lag (ARDL) Model

It is a requirement for applying the ARDL model that all the variables must not have a unit root at level 1 with zero difference or after one difference.

Number of obs = 200
Number of groups = 20
Observation per group: min = 10

Avg = 10.0

Max = 10

Log likelihood = 25.56159

D.ROA	Coeff.	Std.Err.	z	P>|z|	95% Conf. Interval	
Economic	7.439926	.45629	16.31	0.000	6.545615	8.334238
Social	-.4182289	.2733398	-1.53	0.126	-.9539651	.1175073
Environmental	.7927804	.1223623	6.48	0.000	.5529547	1.032606
SR (Short Run)						
ec	-.5404925	.1214992	-4.45	0.000	-.7786265	-.3023586
Economic	-1.584783	1.424332	-1.11	0.266	-4.376422	1.206856
Social	2.722531	1.175821	2.32	0.021	.4179643	5.027098
Environment	-2.254257	1.361263	-1.66	0.098	-4.922284	.413769
Const.	-2.167434	.5839042	-3.71	0.000	-3.311865	-1.023003

From the above table, economic scores are insignificant in the short term but will convert significant in the long term as the p-value is 0.000, in the long run, is below 0.05 and also the absolute value of z scores is 16.31 is over 2 that confirm the significance of economic scores in the long run moreover value of coefficient is 7.439926, that confirms that one per cent change in economic scores will generate 7.439926 per cent change in ROA. Social scores are significant in the short run but might be insignificant in the long run. Meanwhile, environmental scores have a negative significant impact in the short the longrun but turned into a positive sign in the long run. Furthermore, ec have a value -.5404925, which is negative and significant as the p-value is 0.000 confirming the long-term relationship among the variable recommended that deviation in ROA is adjusted by 54% in the current year.

Number of obs = 200

Number of groups = 20

Observation per group: min = 10

Avg = 10.0

Max = 10

Log likelihood = -403.7691

D.ROE	Coeff.	Std.Err.	z	P>|z|	95% Conf. Interval	
Economic	11.98644	3.129039	3.83	0.000	5.853632	18.11924
Social	.415801	1.382711	0.30	0.764	-2.294264	3.125866
Environmental	10.40904	.6754772	15.41	0.000	9.085128	11.73295
SR (Short Run)						
ec	-.6342709	.1465674	-4.33	0.000	-.9215378	-.3470041
Economic	23.44372	7.55315	3.10	0.002	8.639822	38.24763
Social	9.34355	3.574692	2.61	0.009	2.337283	16.34982
Environment	-3.191258	4.380674	-0.73	0.466	-11.77722	5.394704
Const.	.2204271	1.944529	0.11	0.910	-3.590779	4.031633

The empirical result of economic scores, social sores and environmental scores on ROE is given in the above table. Economic scores have a positive significant impact on ROE in both the short run and long run as the p-value is below 0.05 in both cases and the coefficient has a positive value. Social scores have a significant positive impact on firm performance in the short run, but it will be transformed into an insignificant relationship in the long run. Environmental scores are insignificant in the short run but turned into positive significance in the long run. Also, ec is a negative significant that empirically confirms that 64% equilibrium is stored in the variable ROE in the following year and confirms the existence of a long-run relationship among the variables.

Number of obs = 200
Number of groups = 20
Observation per group: min = 10
Avg = 10.0
Max = 10
Log likelihood = -403.7691

D.EPS	Coeff.	Std.Err.	z	P>|z|	95% Conf. Interval	
Economic	16.29587	1.752817	9.30	0.000	12.86041	19.73133
Social	2.602837	.9731308	2067	0.007	.6955355	4.510138
Environmental	-.269135	.4525104	-0.59	0.552	-1.156039	.6177691
SR						
ec	-.4208331	.0970502	-4.34	0.000	-.611048	-.2306183
Economic	11.51083	5.060302	2.27	0.023	1.592823	21.42884
Social	-.1043879	1.68179	-0.06	0.951	-3.400636	3.19186
Environment	.4739012	1.204462	0.39	0.694	-1.886802	2.834604
Const.	-1.744234	.9829194	-1.77	0.076	-3.670721	.1822525

The short-run and long-run relationship between the economic scores, social scores, environmental scores and EPS are shown in the above table. Economic scores have a positive significant impact on ROE in both the short run and long run as the p-value is below 0.05 and the z score is over 2 confirming the significance of the variable and the coefficient have a positive value in both situations. But the social scores are insignificant in the short run but become positive and significant in the long run. Environmental scores are insignificant in the short run and the long run because the p-value is over 0.05. Here, ec is also a negative sign that confirms the 42% speed to restore the equilibrium in the preceding year.

6. Conclusion

The empirical result of this study depicts that the economic dimension of sustainable finance has a significant positive impact on all the performance indicators (ROA, ROE and EPS) of the firm but there is a negative significant relationship between social scores on ROA and ROE but meanwhile show the positive significant relationship with EPS, so overall social performance shows the mix result with firm performance. The environment dimension has a negative significant effect on ROA but shows no significant influence on the firm performance. Combined scores of sustainable finance confirm a positive significant effect on ROA, a non-significant effect on ROE and a significant positive effect on EPS. Thus, overall sustainable finance reveals a mixed result in firm performance that shows the least interest of regulatory authority towards

sustainable finance. Meanwhile, the financial institution must have to incorporate sustainable financial practices into their regular business activities and publish their sustainable reports along with their regular financial reports.

The result of the present study helps the law implementing authorities to establish the law and policies to better guide the financial sector to focus not only on their financial benefit but they're fulfilling their social and environmental obligation.

7. Future Recommendation

The present study is based on the economic sustainability, social sustainability, environmental sustainability and sustainable finance of the banking sector of Pakistan, but the future studies can focus on other sectors of Pakistan.

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