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Article

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ACCOUNTING, CORPORATE GOVERNANCE & BUSINESS ETHICS | RESEARCH ARTICLE

The association between sustainability disclosures and the financial performance of Jordanian firms

Mohammad Azzam¹, Alaa AlQudah^{1*}, Ayman Abu Haija² and Mohammad Shakhathreh¹

Abstract: Researchers are paying an unprecedented level of attention to the role that sustainability disclosures may play in enhancing financial performance. This study, therefore, examines this issue in a developing country context such as Jordan using a panel data set of 1,705 firm-year observations of firms listed on the Amman Stock Exchange. Fixed effect regression with robust standard errors is used to analyse the data. The results show that, while social and governance disclosures are positively associated with financial performance, environmental disclosures do not have this association. Interestingly, when sustainability disclosures are analysed collectively, a highly positive and significant association is found between them. This study recommends that the dimensions of sustainability disclosures complement each other to enhance firms' financial performance.

Subjects: Accounting; Corporate Governance; Corporate Social Responsibility & Business Ethics

Keywords: environmental disclosure; social disclosure; governance disclosure; financial performance

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PUBLIC INTEREST STATEMENT

The key role of listed firms is noticeable in various aspects related to firms' interested groups. Firms are seeking to enhance their performance and in the same line to protect the local environment from the risk that appeared from their operational activities. Hence, firms are motivated to appear as active social players in terms of their sustainability obligations in which they can meet the expectations of their stakeholders. Additionally, such a noticeable and commitment role of the firms may turn the investment compass within the financial markets to be directed to such sustainable firms. Therefore, this study found a noticeable role of the social and governance disclosures in enhancing the financial performance of the Jordanian firms. Interestingly, the environmental disclosures were not recognized as the main factor in improving firms' performance. Through this, firms are working to enhance sustainability disclosures to gain the social acceptance.

1. Introduction

There is growing global interest in sustainability reporting issued by firms about the environmental, social and governance effects of their activities. Such reports can help users to evaluate and manage their goals effectively. Sustainability disclosure is defined as “the practice of managing companies’ impact on the economic, social and environmental issues for the purpose of identifying risks and opportunities that increasingly impact the success of companies through driving performance gains and increasing competitiveness” (ASE, 2020). The Sustainable Development Goals (SDGs) were launched in 2015 to embrace universal sustainable standards and provide firms with a unified framework for sustainability reporting. Recently, Amman Stock Exchange (ASE) has issued guidance on sustainability reporting. It aims to raise the awareness of listed firms of the importance and benefits of issuing sustainability reports. Such benefits include enhancing the reputation of a firm and brand loyalty, enabling stakeholders to understand the firm’s true value and comparing firms’ performances easily.

The ASE’s guide on sustainability focuses on three main issues, namely: environmental (i.e. energy, water, biodiversity and emissions), social (i.e. employment practices and decent work, human rights, society and product responsibility) and governance (i.e. board-separation of powers, tax transparency, fair labour practice and confidential voting). It is remarkable that the sustainability disclosure in Jordan is voluntary. The International Monetary Fund argued that corporate reporting in Jordan is inconsistent and voluntary, even though it is improving over time. Nowadays, financial reporting should not only focus on financial disclosure, but should provide stakeholders with useful non-financial information to enhance reporting quality in order to attract new investors and loyal customers. Al-Dhaimesh (2019) has claimed that the accounting profession faces a big challenge changing its traditional role and reporting the sustainability performance of organisations.

Financial performance is an important indicator for evaluating management performance. Many previous studies have highlighted the role of sustainability disclosure in enhancing firms’ financial performance. For example, Zyadat (2017) and Oncioiu et al. (2020) found that sustainability reporting is related positively to a firm’s financial performance. However, Nizam et al. (2019) argued that, although there is a relationship between financial performance and social and environmental performance in non-financial firms, there is limited evidence for the banking sector. Similarly, Burhan and Rahmanti (2012) claimed that only social disclosure has a positive impact on financial performance, while there is no clear evidence of the impact of environment and governance disclosure. On the other hand, Aggarwal (2013) found no significant relationship between sustainability reporting and a firm’s performance. She suggested exploring the sub-dimensions of corporate sustainability to get clear results on the relationship between sustainability and performance.

Due to the mixed results as well as the lack of empirical studies on the role of sustainability disclosure in enhancing financial performance in developing countries, this study is motivated to explore this relationship using all the firms listed on the ASE. Equally important, examining the sub-dimensions of sustainability in all sectors will provide clearer results. The results of this study will be beneficial to stakeholders, investors and policy makers. Such results will expand the literature and provide empirical evidence on how sustainability reporting affects the financial performance of firms, besides helping top management to justify their sustainability-related decisions and give stakeholders a true picture of the benefits of sustainability practices.

2. General background about Jordan

Jordan is situated in the Middle East region and it has a scarcity of natural resources such as water, oil and gas. Therefore, it depends on taxes as well as foreign aids to cover its financial needs. For example, revenues from income and sales tax represent 71 percent, 66 per cent and 65 percent of total revenues in 2017, 2018 and 2019 respectively (General Budget Department, 2020). Notwithstanding this scarcity of resources, the Jordanian business environment is considered

one of the most attractive environments for foreign investments in the Middle East. Indeed, the statistics disclosed by the ASE show that the market capitalization of stocks owned by foreigners is approximately 46 percent, 50 percent and 49 percent in 2017, 2018 and 2019 respectively. More interestingly, those investors are from 94 nationalities, suggesting that foreign investors are not limited to the Arab countries.¹

Jordan has engaged in several financial and non-financial reforms, especially in the aftermath of the latest global financial crisis which started in 2008. This is especially true given that the market capitalization of stocks on the ASE is largely decreased from \$US 41,147 million in 2007 (before the crisis) to \$US 27,145 million in 2011 (after the crisis).² Therefore, the regulatory bodies have issued number of regulations in order to restore investors' confidence in the capital market. Such issuance includes "Corporate Governance Code for Shareholding Companies Listed on the Amman Stock Exchange" in 2008, "Tax Law No.28" in 2009, "Securities Law No.18" in 2017 and most recently "Guidance on Sustainability Reporting" in 2018. The ASE states that the adoption of sustainability reporting will confer benefits to firms. Such benefits include "reducing business risks and fostering growth opportunities for the company; realizing gains and maintaining the viability of the firm; enhancing operational efficiency and increasing the company's profitability by reducing the costs and rationalizing the exploitation of resources; enhancing the company's workforce satisfaction and fostering the reputation of the company and its brand to build competitive advantage".³

3. Theoretical literature review

3.1. Legitimacy theory

The role of voluntary position in enhancing firms' disclosures via sustainability aspects has increased their transparency and accuracy in terms of preparing financial statements. Such a selective position is expected to increase stakeholders and society acceptance in which firms' values may increase significantly (Siueia et al., 2019). Indeed, firms are willing to achieve society and stakeholders' expectations by enhancing sustainability disclosures in which such firms may appear as attractive investment targets (Gnanaweera & Kunori, 2018; Hardiningsih et al., 2020). Additionally, firms with social acceptance are expected to avoid social sanctions and thus will be able to secure the needed resources to achieve their social and economic goals (Hazaima et al., 2017). Therefore, the survival of firms depends on several internal and external factors. In terms of the internal factors, it covers a firm's financial and non-financial resources (AlQudah et al., 2019). Such resources are very important to guarantee a smooth set of operational activities in which the benefits for shareholders are expected to increase. However, a firm's decisions must be relayed on the environment acceptance where the firm operates. Firms need to legitimise their existence to be classified as active and qualified social players (Campbell et al., 2003). The position of a socially active firm comes from harmonising its activities with the conditions of the surrounding environment. Therefore, firms that wish to be classified as socially and environmentally committed should be active in increasing their disclosures in several fields—in particular on sustainability issues—and make sure their reports meet stakeholders' expectations (Ching et al., 2017). For instance, firms must play an active and functional role in a way that anticipates the responses of stakeholders and the wider society (O'donovan, 2002). This role can be achieved by disclosing more information as a legitimised system (Cho & Patten, 2007), and the system's tools may be adopted by firms to reach stakeholders' expectations (Deegan, 2002). For example, a firm will play a significant role in preparing attractive financial statements and disclosures by adopting legislative regulations in terms of environmental issues and drawing the attention of stakeholders and interested groups to the firm's activities. An attitude of this kind is expected to enhance a firm's financial position (Konar & Cohen, 2001; Siew et al., 2013). As a result, sustainability disclosures are considered an efficient tool by which firms can enhance their social acceptance (Xie et al., 2019). To sum up, increasing sustainability disclosures is seen as a commitment to the suggested contract between firms and their surrounding environment (Choi et al., 2013). Consequently, firms must utilise the available resources in an effective way to achieve the goals of society without destroying stakeholders' social expectations (Wasara & Ganda, 2019). Under the legitimacy theory, firms may

adjust their policies and strategies to guarantee acceptance by society. Hence, firms are expected to create effective communication channels with society by preparing attractive reports. To sum up, legitimacy theory claims that achieving the items of the contract signed between a firm and its surrounding environment will enhance that firm's financial position and maximise shareholders' expectations and wealth (Kartadjumena & Rodgers, 2019; Ur Rehman et al., 2020).

3.2. Signalling theory

Due to the lack of trust among firms' owners and their representatives, the problem of information asymmetry may appear in which some shareholders may evaluate firms' performance inaccurately (Riedl & Smeets, 2017; Xie et al., 2019). Indeed, managers may control the quality and the quantity of published information and portray an attractive image of their activities in controlling their firm's operations (AlQudah et al., 2020). Additionally, managers may increase sustainability disclosures to send a clear signal to outsiders that they are committed to society and they are aware of their firm's contribution towards society's needs. For instance, Ballina et al. (2020) claim that firms may be willing to adopt several regulations and participate in several occasions to send a clear message to shareholders that they are carrying out their activities efficiently and this can have a positive effect on share prices and profitability. Furthermore, this contradiction in interests between the internal and external groups may motivate stakeholders to evaluate a firm's performance differently, based on the level of its disclosures (Brammer & Millington, 2008). Hence, stakeholders may be inclined to increase their evaluation of some firms and decrease their evaluation of others based on the levels of voluntary disclosure. As a result, firms are motivated to enhance and increase the disclosures related to sustainability issues to send a clear signal to stakeholders that these firms are socially committed in a way that presents their firms as an attractive investment destination for investors who hold a social preference background (Riedl & Smeets, 2017; Xie et al., 2019).

4. Empirical literature review and hypotheses development

4.1. Environmental disclosure and the performance of firms

The importance of environmental disclosure has increased significantly since the interests of stakeholders moved on from traditional aspects to environmental issues. Indeed, stakeholders' preferences have been adjusted to concentrate on firms' operational effects on the environment. For instance, keeping gas emissions to a minimum level was not efficient to enhance a firm's performance within the greenhouse firms in the Japanese context (Iwata & Okada, 2011). In addition, Wasara and Ganda (2019) document a weak effect of the environmental disclosures on the performance of mining firms listed on the Johannesburg Stock Exchange. Furthermore, Al-Dhaimesh (2019) finds that, among the several dimensions of sustainability, the environmental part was not active in enhancing the financial performance of firms listed on the ASE.

Buallay (2019) reports that a debate is necessary to explore the reasons behind the insignificant role of environmental aspects in maximising shareholders' expectations in terms of their firm's financial performance. Moreover, Tien et al. (2020) argue that the non-financial aspects that cover environmental disclosures should be accepted and understood efficiently by the managers in Vietnam in a way that facilitates their improvements to financial performance. On the contrary, the Iraqi market has introduced evidence in which the impact of environmental disclosure on Iraqi hotels was slightly more pronounced in comparison with other aspects of sustainability (Al-Wattar et al., 2019). Besides, García-Sánchez et al. (2020) claim that the key success factor in enhancing a firm's performance by increasing environmental disclosures is the real intent of CEOs to disclose such information.

To summarise, a high level of environmental disclosure (i.e. gas emissions, consumption of water and pollution levels) may play a noticeable role in supporting stakeholders' trust in firms' activities, which in turn may enhance firms' financial performance. Therefore, firms need to prepare sustainability reports that meet stakeholders' expectations and, meanwhile, enhance

the firm's financial performance. Based on the previous discussion, the following hypothesis is adopted:

H₁: There is a positive association between environmental disclosure and financial performance.

4.2. Social disclosure and the performance of firms

Social disclosure is considered a significant part of sustainability reporting that covers several aspects, such as human rights, labour rights and work conditions, according to which a decent work environment is expected. Firms are signing invisible contracts with their environments to follow a clear set of steps in terms of their commitment to society (Hardiningsih et al., 2020). In this regard, Hardiningsih et al. (2020) find that the performance of Malaysian and Indonesian firms has been increased significantly as a result of increasing social disclosure levels. In addition, Platonova et al. (2018) show that bank disclosures at the Gulf Cooperation Council were efficient enough to enhance the financial performance of the banking sector. Nuber et al. (2020) conclude that, to enhance the financial performance of firms, proactive steps in adopting sustainability should be clarified to meet stakeholders' expectations.

In contrast, Al-Hadi et al. (2019) refute previous findings by providing new evidence from the Australian market. Specifically, as firms mature, their financial performance is not affected by social disclosures. In the same vein, the suggested positive effect of sustainability disclosure was not as noticeable as expected, since a negative association has been documented between the social aspects of sustainability and financial performance (Laskar, 2019). In a nutshell, the social concepts of a sustainability framework are very significant in facilitating the acceptance of firms as active social players in society. Therefore, enhancing the quality of the social aspects may achieve stakeholders' goals by enhancing firms' financial performance. Hence, this study adopts the following hypothesis:

H₂: There is a positive association between social disclosure and financial performance.

4.3. Governance disclosure and the performance of firms

A high-quality governance system is considered a clear road map for controlling and monitoring the boardroom's activities and decisions in terms of the firm's financial and non-financial operations (AlQudah et al., 2019). Efficient levels of governance disclosure may send a clear signal to stakeholders that firms are operating well in terms of maximising shareholders' wealth (AlQudah et al., 2020). Hence, governance disclosure will increase the transparency of published information and, therefore, minimise the gap in interests between a firm's interested groups. For example, Rajesh (2020) finds that the performance of Indian firms has been enhanced significantly as a result of increasing the pillars of sustainability disclosure, specifically in governance issues. Papoutsis and Sodhi (2020) report the positive effects of governance disclosure in reflecting the actual performance of firms. Additionally, Russian managers are aware of the importance of governance disclosure in enhancing the performance of oil and gas firms (Orazalin et al., 2019).

Based on data extracted from a hundred US firms, Hussain et al. (2018) find weak evidence for the role of governance disclosure in enhancing firms' performance. Uwuigbe et al. (2018) support Hussain et al. (2018) conclusion by documenting a negative link between governance disclosure and financial performance in Nigerian firms. Therefore, the previous research shows mixed results. This inconsistency in results may be attributed to various reasons, such as awareness levels in terms of sustainability disclosures and the financial market's characteristics. In general, governance disclosure is expected to enhance a firm's performance, thus this study adopts the following hypothesis:

H₃: There is a positive association between governance disclosure and financial performance.

5. Research design

This study includes all the firms listed on the ASE from 2009 to 2018 in the sample, as the recommended sustainability disclosures are applied to all sectors and thus no one is excluded or at least has its own standards. This produces 2,246 firm-year observations, as shown in Table 1. Of these, 168, 126 and 112 observations are excluded because the data regarding environmental, social and governance disclosures respectively were not available. Another 135 observations are excluded due to missing financial data. The final sample, therefore, comprises 1,705 firm-year observations. In relation to the study period, it ends with 2018, as the annual reports of listed firms for 2019 have not been disclosed yet due to the Covid-19 pandemic.

Return on assets (*ROA*) is used as a proxy for firms' financial performance, which is measured by the ratio of net income divided by total assets. Sustainability disclosure is measured using three proxies: environmental, social and governance disclosures. Environmental disclosure (*ENV.DIS*) is measured using an aggregated score of seven variables. Social disclosure (*SOC.DIS*) is measured using an aggregated score of thirteen variables. Governance disclosure (*GOV.DIS*) is measured using an aggregated score of eight variables.⁴ Each variable is coded one if the firm meets the ASE's requirements regarding sustainability disclosures, and zero otherwise. Then, the environmental, social and governance disclosures are calculated as the percentage of a firm's dummy variables that meets sustainability disclosures. Hence, a firm with a high percentage indicates high-quality disclosure.

This study also controls for firm size, leverage and market listing status, because such variables may have an impact on the association between dependent and independent variables. Firm size (*SIZE*) is measured by total assets at the end of year. Leverage (*LEV*) is measured by the ratio of total debts to total equity. Market listing status (*MLS*) is measured using a dummy variable that takes the value of one if the firm is listed in the first market and zero if the firm is listed in the second or third market. Table 2 summarises this study's variables and their measurements. Therefore, the following regression equation is used to examine the association between sustainability disclosures and financial performance:

$$ROA_{it} = \beta_0 + \beta_1 ENV.DIS_{it} + \beta_2 SOC.DIS_{it} + \beta_3 GOV.DIS_{it} + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 MLS_{it} + \varepsilon_{it} \quad (1)$$

6. Empirical results and discussion

Table 3 describes the current study's variables from 2009 to 2018. The financial performance of listed firms on the ASE is relatively low, as the mean for *ROA* is approximately 2 percent. This is especially true given that, in an earlier period in the same context, Al-Akra and Ali (2012); Daradkah and Ajlouni (2013) and Jaafar and El-Shawa (2009) report higher indicators for financial performance. However, the negative consequences of the latest global financial crisis (which

Table 1. Sample selection criteria

Description	Number of observations
All firms listed on the ASE from 2009 to 2018	2,246
Less: missing environmental data	(168)
Less: missing social data	(126)
Less: missing governance data	(112)
Less: missing financial data	(135)
Final sample	1,705

Table 2. Summary of variables and their measurements

Description	Variable name	Measurement	Exp. sign
Dependent variable: ROA	Return on assets	The ratio of net income to total assets	
Independent variables: ENV.DIS	Environmental disclosure	An aggregated score of seven variables	+
SOC.DIS	Social disclosure	An aggregated score of thirteen variables	+
GOV.DIS	Governance disclosure	An aggregated score of eight variables	+
Control variables: SIZE	Firm size	The total assets at the end of year	+
LEV	Leverage	The ratio of total debt to total equity	-
MLS	Market listing status	A dummy variable that takes the value of one if the firm is listed in the first market, and zero if the firm is listed in the second or third market	+

Table 3. Descriptive statistics

Variables	Observations	Mean	Median	Min	Max
ROA	1,705	0.021	0.012	-1.015	1.278
ENV.DIS	1,705	0.364	0.285	0.000	0.857
SOC.DIS	1,705	0.331	0.303	0.000	0.833
GOV.DIS	1,705	0.342	0.250	0.125	0.875
SIZE (in million \$US)	1,705	223.6	201.9	0.137	8300
LEV	1,705	0.742	0.270	0.147	2.189
MLS	1,705	0.373	0.247	0.000	1.000

All variables are defined in Table 2.

started in 2008) as well as Arab Spring era (which started in 2011) may lie behind this poor performance of Jordanian firms.

Firms listed on the ASE have a moderate (i.e. regular) level of sustainability disclosures.⁵ As shown in Table 3, the means of environmental disclosure (*ENV.DIS*), social disclosure (*SOC.DIS*) and governance disclosure (*GOV.DIS*) are approximately 36 per cent, 33 per cent and 34 per cent, respectively. This suggests that the overall sustainability disclosure in the Jordanian context is acceptable, especially when compared with other developing contexts. For example, sustainability disclosure is reported as around 10 per cent in Malaysia, 9 per cent in South Africa and 5 per cent in Pakistan (Ur Rehman et al., 2020; Wasara & Ganda, 2019). While the disclosure percentages of firms listed on the ASE are not categorised as “poor disclosure”, some disclosure indicators are reported at minimal level. Such indicators include “Injury Rate”, “Fair Labour Practice”, “Amount of Direct Energy Used”, and “Primary Energy Source”. Table 3 also shows that the mean values recorded for firm size (*SIZE*), leverage (*LEV*) and market listing status (*MLS*) are approximately 223 million, 53 per cent and 37 per cent, respectively.

Table 4. Correlation matrix

Variables	ROA	ENV.DIS	SOC.DIS	GOV.DIS	SIZE	LEV	MLS
ROA	1.000						
ENV.DIS	0.066*	1.000					
SOC.DIS	0.173*	0.285*	1.000				
GOV.DIS	0.051*	-0.003	0.307*	1.000			
SIZE	0.227*	0.234*	0.460*	0.217*	1.000		
LEV	0.020*	0.208*	0.212*	0.088*	0.384*	1.000	
MLS	0.317	0.109*	0.296	0.104*	0.393*	0.169*	1.000

The symbol (*) denotes significance at 1 percent in two-tailed test.
 All variables are defined in Table 2.

Table 4 reports the correlation matrix for variables, which shows that the highest correlation recorded is 46 per cent between social disclosure (SOC.DIS) and firm size (SIZE). It seems that large firms are more interested, compared with small firms, in disclosing social information. The problem of multicollinearity, however, does not create a concern with the current study's findings.

The current study also checks other assumptions of regression analysis (i.e. homoscedasticity, normality and no serial correlation). After performing the Breusch-Pagan test for homoscedasticity and skewness and kurtosis for normality, it appears that the data violates these two assumptions. The Durbin-Watson *d statistic* is used to test serial correlation. The result (i.e. *d statistic* is closer to 2) indicates that the assumption of no serial correlation is met. Robust standard errors, however, are used in the current study to control the violated assumptions of regression analysis, namely homoscedasticity and normality.

Table 5 reports the results of fixed effect regression with robust standard errors for the association between sustainability disclosures and financial performance. The reported results show a positive and significant association ($p < 0.01$) between social disclosure (SOC.DIS) and firms' financial performance, suggesting that any increase in social disclosure will lead to an increased level of firms' financial performance measured by return on assets (ROA). A possible justification of this result is that the disclosed information regarding social aspects is positively perceived by individuals as well as organisations. Such information includes "Non-Discrimination", "Gender Diversity", "Child Labour", "Human Rights Policy", "Health" and "Donations". Hence, H_2 is accepted.

Table 5. Regression results of the association between sustainability disclosures and ROA

Variables	Coefficient	T-value	Probability
ENV.DIS	0.222	1.05	0.291
SOC.DIS	1.637	7.06	0.000
GOV.DIS	1.777	6.07	0.000
SIZE	1.760	2.35	0.019
LEV	-0.009	-2.43	0.015
MLS	0.090	2.87	0.004
Constant	-1.428	-10.49	0.000
Adjusted R²	18.6		
No. of observations	1,705		

Notes: This table presents the results of fixed effect regression of the association between sustainability disclosures and ROA. The sample comprises 1,705 firm-year observations of firms listed on the ASE from 2009 to 2018. The dependent variable is return on assets (ROA). Independent and control variables are defined in Table 2.

This study also proposes that the level of governance disclosure (*GOV.DIS*) may be associated with improvements in a firm’s ability to maximise its financial performance. Indeed, the results reported in [Table 5](#) support this proposition and show a positive and significant association ($p < 0.01$) between governance disclosure and *ROA*. This result is in line with the perspective in the literature that firms with high-quality governance structure are more able to obtain funds and attract investors, thus their financial performance is improved. Indeed, in the current study there is an acceptable level of governance disclosures, such as “Board-Separation of Powers”, “Ethics Code of Conduct” and “Tax Transparency”. Furthermore, firms’ boards that include a high level of board independence and non-duality leadership structure are more able to exert pressure on management to disclose the needed governance information, thus the investors’ and other stakeholders’ confidence will be increased. Based on this conclusion, H_3 is accepted.

Inconsistent with this study’s expectations, [Table 5](#) shows a positive but insignificant association between environmental disclosures (*ENV.DIS*) and *ROA*, indicating that financial performance is not affected by the level of environmental disclosure. This is probably because not all aspects of environmental issues can be disclosed by firms listed on the ASE. Indeed, the mean value recorded for “Energy Intensity”, “Primary Energy Source” and “Waste Management” is 4 per cent, 5 per cent, and 13 per cent, respectively. For example, educational and financial firms are less likely to have such information, which in turn may lead to this insignificant association between environmental disclosures and firms’ performance. Thus, H_1 is rejected.

[Table 5](#) also reports the results for control variables. Firm size (*SIZE*) is found to be positively and significantly associated with *ROA*. Such an association is highly expected based on the argument that large firms are more able, compared with small firms, to generate profits due to the assets, resources and commercial connections they have. Similarly, firms whose stocks are listed in the first market (*MLS*) on the ASE report high returns on their assets. This is especially true given that previous studies in the Jordanian capital market, such as that of Qawasmeh and Azzam (2020), found that the first market is more profitable and attractive for investors, especially foreigners. Finally, leverage (*LEV*) is negatively linked to *ROA*, suggesting that a highly leveraged firm is less likely to enhance its reported earnings over years.

In an attempt to make the primary findings that are reported in [Table 5](#) more robust, two different tests are undertaken in this study. Firstly, the *Tobin’s Q* is used as an alternative measure of financial performance, which is measured by the ratio of market value of a firm’s equity divided by its book value. [Table 6](#) reports the results of fixed effect regression with robust standard errors

Table 6. Regression results of the association between sustainability disclosures and Tobin’s Q

Variables	Coefficient	T-value	Probability
<i>ENV.DIS</i>	0.339	1.43	0.153
<i>SOC.DIS</i>	1.791	7.63	0.000
<i>GOV.DIS</i>	2.463	7.46	0.000
<i>SIZE</i>	2.810	3.34	0.001
<i>LEV</i>	-0.010	-3.22	0.001
<i>MLS</i>	0.135	3.81	0.000
Constant	-1.852	-12.07	0.000
Adjusted R²	21.9		
No. of observations	1,705		

Notes: This table presents the results of fixed effect regression of the association between sustainability disclosures and Tobin’s Q. The sample comprises 1,705 firm-year observations of firms listed on the ASE from 2009 to 2018. The dependent variable is Tobin’s Q, which is measured by the ratio of market value of a firm’s equity divided by its book value. Independent and control variables are defined in [Table 2](#).

for the association between sustainability disclosures and *Tobin's Q*. As shown in the table, the coefficients and T-values of all variables are increased and the Adjusted R^2 is also increased.

Indeed, social disclosure (*SOC.DIS*) and governance disclosure (*GOV.DIS*) remain positively and significantly associated with *Tobin's Q*. While the magnitude of coefficient and T-value of environmental disclosure (*ENV.DIS*) increased, it still has insignificant association with firms' financial performance. In terms of control variables, the same significance and direction are reported, except that the significance level of leverage (*LEV*) increases from 5 percent to 1 percent. Overall, applying an alternative measure of financial performance yields similar findings, suggesting that the primary results are not biased by the use of *ROA* as a proxy for financial performance.

Secondly, an aggregated score format of sustainability disclosures is adopted instead of analysing the individual effect of environmental, social and governance disclosures on firms' financial performance. This is because the overall score may help in determining whether sustainability disclosures work better individually or collectively. Therefore, an aggregated score of 28 variables regarding environmental, social and governance disclosures is created by calculating the percentage of a firm's dummy variables that meets sustainability disclosures.

Table 7 reports the results for the association between the aggregated score format of sustainability disclosures (*DIS.SCORE*) and financial performance using two models, where the first model measures performance by *ROA* and the second model measures performance by *Tobin's Q*. A highly positive and significant association is found between them in both models, indicating that sustainability disclosures work better collectively, which in turn maximises firms' financial performance. This is probably because the three dimensions of sustainability disclosure complement each other to enhance performance; especially, the current study finds that environmental disclosures, separately, do not play a vital role in improving financial performance.

7. Summary and conclusion

The issue of sustainability disclosure has received increased attention from listed firms, regulatory agencies and academics, especially in the last decade. This is due to the critical role that sustainability disclosure is expected to play in enhancing firms' financial performance. Prior research, however, provides mixed results on the association between environmental, social and governance disclosures and financial performance. This study, therefore, contributes to the literature by providing new evidence on this association from the Jordanian capital market. A panel data set

Table 7. Regression results of the association between the aggregated score format of sustainability disclosures and financial performance

Variables	Model One		Model Two	
	Coefficient	T-value	Coefficient	T-value
DIS.SCORE	3.422	10.41***	3.888	10.46***
SIZE	1.800	2.42**	3.020	3.59***
LEV	-0.001	-2.74***	-0.002	-3.58***
MLS	0.088	2.82***	0.134	3.76***
Constant	-1.368	-11.05***	-1.627	-11.63***
Adjusted R²	21.9		26.8	
No. of observations	1,705		1,705	

Notes: This table presents the results of fixed effect regression of the association between the aggregated score format of sustainability disclosures (*DIS.SCORE*) and financial performance. In model one, financial performance is measured by *ROA*. In model two, financial performance is measured by *Tobin's Q*. The sample comprises 1,705 firm-year observations of firms listed on the ASE from 2009 to 2018. Independent and control variables are defined in Table 2.

The symbols (*), (**) and (***) denote significance at 10, 5 and 1 percent, respectively, in two-tailed test.

of 1,705 firm-year observations of firms listed on the ASE is investigated. Sustainability disclosure is measured using an index of 28 items: 7 for environmental, 13 for social and 8 for governance.

The results show that social and governance disclosures are positively and significantly linked with financial performance. These results are confirmed using an alternative measure of financial performance (i.e. *Tobin's Q*) as well as examining an aggregated score format of sustainability disclosures, instead of analysing the individual effect of each dimension separately. This indicates that sustainability disclosure may create an incentive for individuals and organisations to deal more (i.e. sell or buy) with the firm, which in turn leads to improved earnings. Environmental disclosure is found to be insignificantly associated with financial performance. This is because some sectors on the ASE (i.e. educational and financial sectors) are less likely to have environmental issues, compared with other sectors, which need to be disclosed in firms' annual reports. This study, therefore, recommends that the dimensions of sustainability disclosure complement each other to enhance firms' financial performance. Standards setters also need to take into consideration the differences between sectors in terms of the nature of the business. Hence, a unified format of sustainability disclosure may not be suitable for all sectors and thus a separate format for each group of sectors with the same characteristics may be more useful.

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Notes

1. Full details regarding these information are available at: https://sdc.com.jo/arabic/index.php?report_type=4&option=com_public&Itemid=28&year=2019.
2. Source: ASE. Available at: https://www.ase.com.jo/en/library-and-publications?publication_category=16.
3. Source: ASE. Available at: <https://www.ase.com.jo/en/news/ASE-issued-Guidance-Sustainability-Reporting>.
4. Full details regarding these variables are available at: <https://www.exchange.jo/sites/default/files/2018-11/Guidance%20on%20Sustainability%20Reporting%202018.pdf>.
5. Lozano (2011) argues that "1- the information presented is of poor performance, equivalent to around 25 per cent of the required full information. 2- the information presented is of regular performance, equivalent of around 50 per cent of the full information required by the indicator. 3- the information presented is considered to be of good performance, equivalent of around 75 per cent".

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