The Moderating Role of ESG Disclosure on the Relationship between Herding Behaviour and Market Capitalization in the Egyptian Stock Market

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المستخلص :

يتناول هذا البحث التأثير المعدل للإفصاح البيئي والاجتماعي والإداري (ESG) على العلاقة بين سلوك القطيع والقيمة السوقية. تم تحليل البيانات المالية لـ 22 شركة مدرجة في مؤشر S&P/EGX ESG من عام 2018 إلى عام 2023 باستخدام تحليل بيانات Panel Data. تكشف النتائج عن وجود علاقة إيجابية ذات دلالة إحصائية بين القيمة السوقية وسلوك الرعي. علاوة على ذلك، تشير النتائج إلى أن تطبيق الإفصاح الإلزامي البيئي والاجتماعي والحوكمة يعزز الارتباط بين القيمة السوقية وسلوك القطيع. ويوضح التحليل أن الشركات ذات الأداء المتفوق في مجال الحوكمة البيئية والاجتماعية والحوكمة تؤثر على القيمة السوقية للشركة، مما يؤدي في النهاية إلى ارتفاع تقييمات الأسهم. وهذا يؤكد الأهمية المتزايدة للعوامل البيئية والاجتماعية والحوكمة في صياغة قرارات الاستثمار، وتعزيز شفافية السوق، والتأثير على ديناميكيات السوق بشكل عام في مصر .

الكلمات المفتاحية: سلوك القطيع؛ الافصاح البيئي والاجتماعي والحوكمة؛ القيمة السوقية؛ مصر .

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Abstract:
This paper examines the moderating effect of environmental, social, and governance (ESG) disclosure on the relationship between herd behavior and market capitalization. The financial data of 22 companies listed in the S&P/EGX ESG index from 2018 to 2023 is analyzed using panel data analysis in the study. The empirical results reveal a statistically significant positive association between market capitalization and herding behavior. Furthermore, the results indicate that implementing mandatory ESG disclosure strengthens the association between market capitalization and herding behavior. The analysis demonstrates that companies with superior ESG performance impact firm market capitalization, ultimately leading to higher stock valuations. This emphasizes the growing importance of ESG factors in formulating investment decisions, reinforcing market transparency, and influencing overall market dynamics in Egypt.

Keywords: Herding Behavior; ESG; Market Capitalization, Egypt.

1. Introduction:

The ESG trend, which is sweeping the global financial sector, has reached Egypt as well. Efficient use of resources, pollution control, waste management, and mitigation of climate change are all aspects that make up the ESG environmental component, which gauges the company's effect on the environment (Flamer,2021; Kellner, 2022). The social aspect of ESG primarily focuses on a corporation's interactions with its stakeholders, including its employees, suppliers, and consumers, as well as worker rights, diversity, inclusion, and confidentiality of personal information (Eccles et al., 2011). A company's transparency, board makeup, executive remuneration, shareholder rights, and overall leadership structure are all assessed under the governance component. Risk is reduced, and long-term sustainability is advanced by effective governance methods (Chapple & colleagues 2011). By integrating these aspects into investment decision-making, the ESG index aims to build a more thorough knowledge of a company's value proposition.

Investors are increasingly concerned with the long-term health of society and the planet. Consequently, they may employ ESG investing to ensure that their portfolios adhere to sustainable standards and positively impact society (Omotehinwa & Azeez, 2022). On the contrary, serious risks await businesses with insufficient ESG strategies, such as fines from environmental regulators, employee protests over discrimination in the workplace, and damage to their brand due to data breaches. One way ESG investing helps investors reduce their exposure to these risks is by giving preference to companies with strong ESG performance (Nguyen et al., 2015). Furthermore, growing evidence shows that strong ESG practices positively correlate with financial performance. Prioritizing ESG elements can help companies manage risk better, recruit and keep top personnel, and build a favorable brand image (Luo &Tian, 2019).

According to economic theory, optimal investment decisions require rationality based on symmetric information. However, investor psychology may be in conflict with this idea.

According to Thaler and Sunstein (2008), market bubbles could explain this seeming paradox, influenced by specific emotions and societal factors that affect how money is spent and how investments are made.

In addition, according to behavioral finance theory, herding is heavily influenced by social factors. These factors include conformity bias and the use of heuristics (Huang et al., 2015; Bikhchandani et al., 1992; De Long et al., 1990). As a result, herding plays a role in investors' choice towards their investments. People depend on the decisions of others when making financial decisions rather than carefully analyzing the underlying information (Banerjee, 1992). Moreover, investors engage in herding when they fail to do their own research and instead make poor decisions to align with the crowd's opinion (Gervais & Odean, 2001). Anxieties about not fitting in or trusting the group's consensus might drive this behavior. (De Long et al.,1900). Investors tend to follow the crowd when they buy popular, high-risk assets, which can cause the financial markets to experience volatility swings (Li et al., 2017). On the contrary, herding may have potential benefits, such as lowering the cost of information gathering and reducing short-term risks (Hirshleifer & Welch, 1999).

There has been a growing trend in interest among business leaders in studying the link between CSR/ESG and financial performance. Studies have shown that traditional profit-driven methods are giving way to more eco-friendly ones, often called "green investment" (Buchholz, 1993; Wang et al., 2020). An example of a green investment would be buying securities in a company with a track record of being environmentally responsible or making strides toward becoming more sustainable (Roos et al., 2024).

On another note, businesses consider ESG an important factor, and investors have also become eager to consider investing in companies with high ESG ratings (Bauer et al., 2005; Renneboog et al., 2012). Those looking to put their money where their ideals are can look for companies committed to doing good for the environment (Pelova, 2012; Hahn et al., 2015). Research by Bol and Linsmeier (2019) suggests that investors can put too much stock in ESG ratings given by third parties, ignoring the need for a comprehensive independent review. Because of this, many investors may seek out highly-rated ESG assets, regardless of their risk appetite or investing goals. Further explanation of this idea is provided by Flammer (2020), who also highlights the dangers of investing in some ESG factors. As a result of herd mentality, investments in certain ESG might increase rapidly regardless of their true worth, the underlying assets, and the underlying quality. This trend might cause speculative bubbles in some ESG industries, which might cause huge financial losses.

There are a plethora of ways in which strong ESG standards can improve financial performance. It is achieved by having a favorable public perception of the company's brand, lower operational risks (including environmental risks like pollution fines), and more devoted employees (Naranjo-Gil & colleagues 2016). Financial health can be further improved by proactive ESG efforts that promote operational efficiency and cost reductions (Wang & Luo, 2020). Finally, a lower cost of

capital is one possible outcome. Investors view outstanding ESG performance as an indicator of a company's commitment to sustainability and good governance, which could lead to more future investments in the company (Flammer & Sewerin, 2021).

Some research finds a favorable relationship between environmental, social, and governance (ESG) factors and financial outcomes, whereas other studies find no relationship or even a negative one (Friede et al., 2015; Lins et al., 2017). Several factors may contribute to these differences, such as using different industry-specific factors, different ESG measurements, and measuring financial performance differently (Araya & Bhattacharya, 2017). The complexity is further increased because the advantages are long-term in nature. Strong ESG practices could potentially generate substantial long-term value; however, in the short run, numbers may not provide the true picture (Eccles et al., 2014).

Market capitalization (market cap) and investor behavior are closely related. Market capitalization provides a standard method for determining the value of companies. Damodaran (2018) states that the current market price per share multiplied by the total number of outstanding shares issued is used to calculate market capitalization. Investors can easily compare companies using this technique, regardless of the industry or specific financial measures. Market capitalization offers a common way to compare the size of different industries (Fernandes et al., 2017).

Utilizing Egyptian-listed firms in the S&P/EGX ESG index, this study examines the moderating influence of ESG disclosure on the relationship between herding behavior and market capitalization. It aims to accomplish two primary objectives: comprehend the impact of herding behavior on market capitalization (market cap) and assess the moderating effect of ESG disclosure on the relationship between market capitalization (market cap) and herding behavior. The paper provides a comprehensive approach that incorporates insights from behavioral finance.

The paper is organized as follows: the second section presents the theoretical foundation established through a literature review encompassing herding theory, ESG in Egypt, market capitalization, the relationship between herding and market capitalization, and ESG and investor behavior. Section 3 displays the methodology, then delineates the data collection process from the Egyptian stock market and S&P/EGX ESG index over a six-year period (2018–2023), and introduces research variables and their corresponding measures. Section 4 exhibits data analysis, discussion, conclusions, limitations, and future research areas.

2. Literature Review
2.1 ESG in Egypt

In recent years, Egypt's approach to environmental, social, and governance (ESG) disclosure has substantially transformed. Voluntary initiatives were initially prioritized. This was exemplified by the Egyptian Exchange's (EGX) 2007 introduction of the S&P/EGX ESG Index. This innovative initiative sought to increase awareness of environmental, social, and governance (ESG) factors among investors and businesses by evaluating the environmental performance of prominent publicly traded companies (Elsayed & Kirkpatrick, 2018).

Both government and non-government actors provided additional incentives for the adoption of ESG. In 2016, the government implemented the "Vision 2030" strategy prioritizing sustainable development (The Presidency of the Arab Republic of Egypt, 2016). Furthermore, the Egyptian Corporate Responsibility Center (ECRC), which was jointly established in 2007 by the Industrial Modernization Center (IMC) and the United Nations Development Programme (UNDP), played a critical role. The ECRC assisted businesses in implementing the UN Global Compact's principles, consistent with sustainable development and environmental responsibility objectives.

In 2022, the Financial Regulatory Authority (FRA) issued a decree that required ESG disclosure for specific corporations, marking a significant turning point (Financial Regulatory Authority, 2022). This transition to mandatory reporting indicates the Egyptian government's unwavering dedication to promoting sustainability and transparency in the country's business sector.

Furthermore, the Egyptian Stock Exchange (EGX) has pioneered promoting ESG practices among listed corporations. Numerous initiatives have been implemented to accomplish this leadership, including stringent disclosure requirements that include mandatory ESG reporting as a fundamental component. The EGX also advocates for specific reporting standards, such as the Global Reporting Initiative (GRI) and the Task Force on Climate-Related Financial Disclosures (TCFD). Additionally, the EGX has collaborated with international sustainability initiatives, published annual sustainability reports, and established the S&P/EGX ESG Index. Egypt's dedication to sustainable development within its business sector is further reinforced by Decree No. 108 of 2021, which requires ESG disclosure for companies listed on the EGX. These developments indicate that Egypt is transitioning from voluntary initiatives to a more comprehensive framework with mandatory reporting requirements.

There has been substantial growth in incorporating ESG factors into investment decisions in recent years. Research indicates that incorporating environmental, social, and governance (ESG) factors may result in investment strategies that are more rational and oriented toward the long term (Flammer & Sewerin, 2018; Krueger & Saxton, 2020). This can reduce flocking behavior by directing investors' attention to the company's fundamentals rather than solely following market trends. Potential Effects of ESG on the Relationship Between Market Capitalization and Herding Behavior. Boulton et al. (2018) suggest that robust ESG disclosure can enhance transparency and information asymmetry, hence reducing reliance on aggregation for information gathering.

Furthermore, organizations that prioritize environmental, social, and governance (ESG) initiatives may be perceived as less hazardous, potentially attracting more sophisticated investors who are less susceptible to herding. (Eccles et al., 2012). Additionally, ESG integration frequently underscores the importance of long-term sustainability, which may encourage investors to prioritize company fundamentals over short-term market fluctuations that could potentially induce herding behavior (Genschel et al., 2013).

2.2 Herding behaviour

Herding behaviour, a well-established cognitive phenomenon, is when individuals are inclined to adopt the beliefs or behaviors of a majority group despite their skepticism regarding the group's accuracy. This inclination originates from a desire to adhere to established social norms or

dreading isolation. Herding can substantially impact the investment decisions of individuals and groups, resulting in both positive and negative outcomes despite its prospective benefits (e.g., reduced decision-making effort). Keynes (1936) posited that individuals frequently adhere to the majority in ambiguous situations, believing the majority has more accurate information.

Nevertheless, contemporary interpretations delve deeper, investigating various psychological and sociological mechanisms that underlie this behavior. As Bikhchandani et al. (1992) noted, individuals rely on the observed decisions of others as informational cues, irrespective of their accuracy. Asch (1951) contended that individuals are incentivized to conform their behavior to the perceived majority opinion due to their fear of censure or exclusion. Nevertheless, Gigerenzer & Goldstein (2009) reported that individuals might use mental shortcuts, such as imitating successful individuals, to facilitate decision-making, which may result in herding behavior, particularly when individual information is scarce (Surowiecki, 2004; Whyte, 1952).

2.3 Market capitalization and herding behaviour

Market capitalization is an essential metric for investors and companies. It indicates a company's financial health (Aswath, 2012). Nevertheless, market capitalization can be substantially influenced by market psychology. Herding behavior, which involves investors adhering to the actions of others without regard for fundamental analysis, can potentially affect market capitalization and distort market efficiency (Bikhchandani & Sharma, 2000).

Market capitalization and herding behavior exhibit a complex relationship. Studies posit a stronger association between herding and periods of market uncertainty (Antoniou et al., 2008). Conversely, Changett et al. (2014) suggest that herding can occur even in stable markets. Siestat and Albuquerque (2008) contribute further by demonstrating a positive correlation between herding and market capitalization, implying that larger companies might be more susceptible to valuation inflation due to herding behavior (Grinblatt & Shleifer, 2008). This aligns with Haigh et al. (2005) and Bikhchandani et al. (1992), who argue that herding distorts prices from their intrinsic value. Additionally, Barberis et al. (1998) link herding to increased market volatility, potentially leading to significant market capitalization declines when the herd mentality reverses, as noted by Shiller (2005).

2.4 ESG in Egypt

Limited work has been done based on the Egypt market concerning ESG variables. Abd ElBar et al. (2017) employed stock price analysis to explore the influence of social, environmental, and corporate governance (ESG) disclosures on firm value in Egypt. Their research encompassed 10 listed firms from 2011 to 2015. Using simple regression and the Pearson correlation coefficient and found an insignificant impact on stock price. Followed by Aboud & Diab (2018) and (2019) conducted separate studies in the Egyptian context on listed firms from 2007 to 2016 and on a sample of the 100 most active Egyptian companies over the same period (2007-2016), respectively. Their research revealed a positive and significant relationship between environmental disclosure and firm value, as measured by Tobin's Q and ROA.

Shaban (2019) studied the impact of sustainability disclosure on firm value for 45 Egyptian firms using a fixed-effect regression model from 2010 to 2017. The study shows a significant positive relationship between the market value of shares and sustainability disclosure. Abdelmalak (2024) examined 200 companies listed on the EGX EWI 100 index from July 2007 to August 2023. The researchers used a fixed-effects regression model to investigate the relationship between stock returns and return on sales (ROS) and found a positive, significant relationship.

Formerly, Bakheet et al. (2021) also examined the relationship for 30 listed firms in the ESG index in Egypt. Their research used a logistic regression model to analyze the relationship between CSR disclosures and financial performance. The study found a positive significant relationship when using (ROA and ROE) as financial performance metrics. Otaify (2021) studied the risk and return analysis of the Egyptian ESG index versus the EGX30 index using old GARCH models from June 2007 to September 2020. The study found that the annualized returns of the ESG index are better than those of EGX30, while El Hindawy et al. (2021) studied 66 non-financial firms in Egypt from 2010 to 2018 using the fixed effect panel and GLS regression models. The study showed a positive significant relationship with ROE, a negative relationship with ROA, and an insignificant relationship when using Tobins Q.

The findings from Egyptian research are not entirely consistent, mirroring mixed results observed in broader international studies. Similar to Aboud & Diab (2019), Bakheet et al. (2021), and Abdelmalak (2024) in Egypt, studies by De Castro Sobrosa Neto et al. (2020) studied 40 Brazilian firms from 2014 to 2018, Zaz (2021) studied 62 firms in Finland from 2010 to 2020, Aydoğmuş et al. (2022), studied 1720 firms worldwide from 2013 to 2021. Fu & Li (2023), 2,256 share-listed firms in China from 2005 to 2021, report a positive relationship between ESG and various performance metrics.

However, El-Hindawy et al. (2021) in Egypt align with Muzanya (2022), who investigated 70 firms in South Africa from 2011 to 2019 and found negative correlations. Additionally, Iqbal et al. (2012) studied a sample of 156 Pakistani-listed companies from 2010 to 2011. Ahlklo & Lind (2019), 267 stock-year observations of Nordic countries from 2016 to 2018, and Chininga (2022) in his study that covered 40 South African firms from 2015 to 2019 reported insignificant relationships.

These variations in results likely stem from several factors, including the specific ESG disclosure metrics used and the chosen financial performance indicators. Notably, most existing studies in Egypt rely on traditional financial metrics like ROA and ROE.

3. Research Hypotheses:

The subsequent hypotheses can be formulated by organizing prior research and studies that examined ESG as an independent, mediating, or moderating variable, and this research will utilize the ESG variable as a moderating variable to capture its impact on the relationship if found between herding behaviour and market capitalization, as follow:

H$_{01}$: *There is no statistically significant relationship between herding behavior and market capitalization.*

H$_{02}$: *The ESG as a moderating variable does not have a statistically significant effect on the relationship between herding behavior and market capitalization.*

4. Model and methodology:

Panel data was collected from two data sources: the published financial statements for sample firms and the Egyptian exchange website. It extracted data from 22 companies listed on the Egyptian Stock Exchange (according to the SP/EGX ESG index) during a 6-year period (2018–2023). From 2018 to 2020, it was before disclosing ESG, and then from 2021 to 2023, after disclosing ESG activities.

The research employed the quantitative method. First, it tested the impact of the ESG disclosure variable as a moderating variable on the relationship between herding behavior as the independent variable and market capitalization as the dependent variable. Second, quantifying the data will ensure that the results are more precise and can be replicated in the future. The following figure (1) indicates the average ESG score for the research company sample (2021–2023), followed by table (1), which introduces research variables and their measures.
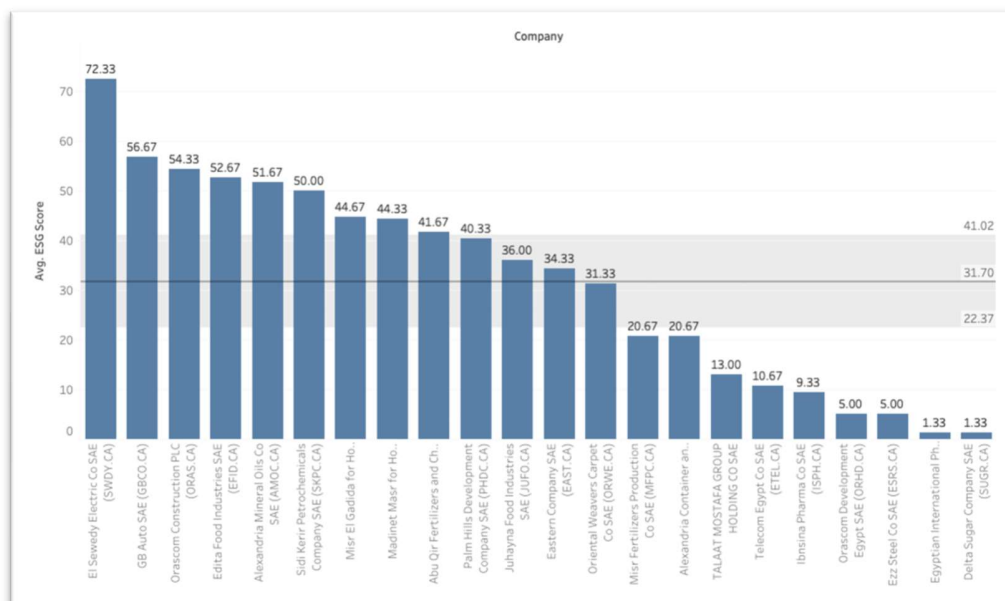
Figure 1: Average ESG Score for research company sample (2021 – 2023)

Table1: Research Variables variables

| Variable Type	Name	Appr.	Measures
Dependent	Market capitalization	Mcap	No. of outstanding Share × Market Price
Control	Net Income	Nincome	Accounting report net income
	Firm size	Fsize	Natural logarithm of total assets
	Firm age	Fage	Time between initial creation and present time
Independent	Herding behavior	CSAD	Cross-sectional absolute deviation of returns
Moderating	ESG	ESG*CSAD	ESG (is a dummy variable =1 for year with disclosure and = 0 for year without disclosure.) X Herding measure CSAD to constitute moderating role.

Source: Prepared by authors

This research used the Cross-sectional absolute deviation of returns (CSAD) Methodology of herding behavior, as discussed below:

$$CSAD_t = \frac{1}{N} \sum_{i=1}^{n} |R_{i,..,,.t} - R_{m,,t}| \ldots\ldots$$

Ri,t represents the stock's daily return, Rm,t represents the market's daily return, and N is the number of equities in the employed index. Chang et al. (2000) introduced the CSAD model, which provides a simple and comprehensible method for quantifying herding. It evaluates the extent to which the returns of individual stocks differ from the average market return. A tighter clustering of individual returns around the market return is suggested by lower CSAD values, which may imply herding behavior. In contrast, higher CSAD values indicate a potential reduction in herding and a larger degree of dispersion.

The model employs historical data on the market return (Rm,t) and individual stock returns (Ri,t) for a specific period (t). The difference between the return of an individual stock and the aggregate market return (in absolute terms) is represented by the absolute deviation (|Ri,t - Rm,t|) for each period. Ultimately, the CSAD for a specific period is determined by averaging the absolute deviations of all individual equities (N) within that period.

Although CSAD is a widely recognized method, alternative methods exist for evaluating herding. However, one of the primary benefits of CSAD is its relative simplicity in interpretation and implementation when contrasted with methods such as LSV. In addition, research indicates that CSAD may be more susceptible to herding behavior, particularly during periods of elevated trading activity (Caparrelli et al., 2004). This sensitivity can be essential for researchers interested in capturing even the most subtle instances of herding within the market.Figure(2) depicts the research model that will be tested using the STATA V_{14} Program.
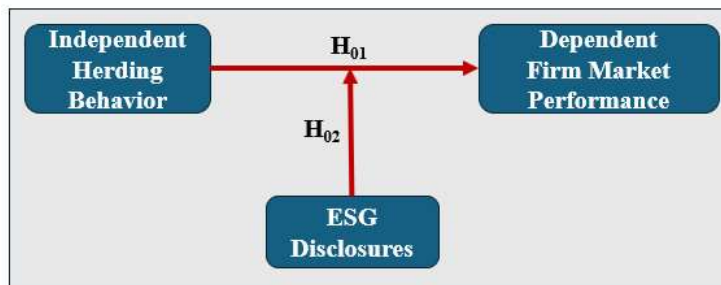
Figure 2: Research Model

Source: Prepared by Authors

The first model measures the impact of herd behavior on the firm's performance before disclosing ESG.

$$lMcap_{it} = a + \beta_1 (CSAD_{it}) + \beta_2 (Fsize_{it}) + \beta_3(Fage_{it}) + \beta_4 (lNincome_{it}) + \varepsilon_{it}... (1)$$

The second model measures the impact of ESG disclosure as a moderating variable on the relationship between herding behavior and firm market capitalization.

$$lMcap_{it} = a + \beta_1 (CSAD_{it}) + \beta_2 (Du\_ESG_{it}) + \beta_3 (ESG*CSAD_{it}) + \beta_4 (lNincome_{it}) + \beta_5 (Fsize_{it}) + \beta_6 (Fage_{it}) + \varepsilon_{it}... (2)$$

The dependent variable (LMcap) is the market cap (market capitalization), which is the logarithm of the total value of shares. It is calculated by multiplying the price of a stock by its total number of outstanding shares. The control variables include (Nincome) firm net income, (Fsize) firm size (the natural logarithm of total assets), and (Fage) firm age (the time between the initial creation of a firm and the present time in years).

Du_ESG is considered a dummy variable that takes (1) if the company discloses the ESG and takes (0) if it does not disclose it. therefore, the Methodology of herding behavior (CSAD) will be measured by the following equation:

$$CSAD_t = \frac{1}{N} \sum_{i=1}^{n} |R_{i,...,t} - R_{m,,t}| ....(1)$$

Where Ri,t is the return of the stock on the day, $R_{m,t}$ is the market return on the same day, and N is the number of stocks in the index used. Meanwhile, the moderating variable (ESG*CSAD) expresses the interaction between ESG disclosure and herd behavior.

Descriptive analysis results before ESG disclosure indicate that the arithmetic mean of the market capitalization variable (Mcap) reached 11 million pounds for the firms during the period from 2018 to 2020, with a standard deviation of 8.9. The herd behavior (CSAD) mean is 5, with a standard deviation 0.51. In addition, the mean for control variables, net income (Nincome), company size, and company age, is (1,030 - 6.7 - 33.3), respectively, with a standard deviation of (1.9 - 1.05 - 26.02). But, descriptive analysis after ESG disclosure indicates that the arithmetic mean of the market capitalization (Mcap) increased to 16 million pounds, and the herd behavior

(CSAD) mean reached 7 with a standard deviation of 3.6 by comparing the results of the descriptive analysis before and after the ESG disclosure, we found the following:

The market capitalization of the companies under study ranged from 1.16 million Egyptian pounds to 39.2 million Egyptian pounds during the period from 2018 to 2020. After the ESG disclosure, the market capitalization increased, ranging from 2.04 million Egyptian pounds to 39.2 million Egyptian pounds during the period from 2021 to 2023.

The companies' net income also improved after disclosing the ESG for these companies.

Table (2) Descriptive Statistics Before & After Disclosure ESG

Variable	Before Disclosure ESG		After Disclosure ESG	
	Mean	Std. Dev.	Mean	Std. Dev.
Mcap	11,746,348	8,945,382	16,086,365	14,732,339
Nincome	1,030,486	1,968,731	2,325,547	3,012,065
Fsize	6.799	1.052	6.854	1.254
Fage	33.318	26.269	36.318	26.269
CSAD	4.99	0.513	7.006	3.606

Source: Stata V14 Output.

After conducting a descriptive analysis of the study variables, a correlational analysis was conducted to understand and clarify the relationship between the variables for the companies under study. Table (2) shows the correlation test results between the market capitalization and the independent variables.

Table 3: Results of the correlation test

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) IMCap	1.000						
(2) CSAD	0.243*	1.000					
	(0.005)						
(3) Du_ESG	0.218*	0.438*	1.000				
	(0.012)	(0.000)					
(4) ESG_Du_CSAD	0.259*	0.855*	0.832*	1.000			
	(0.003)	(0.000)	(0.000)				
(5) lnincome	0.460*	0.054	0.124	0.103	1.000		
	(0.000)	(0.545)	(0.166)	(0.250)			
(6) Fsize	0.188*	-0.075	0.025	-0.032	0.738*	1.000	
	(0.030)	(0.395)	(0.774)	(0.717)	(0.000)		
(7) Fage	0.099*	0.040	0.057	0.057	-0.312*	-0.358*	1.000
	(0.007)	(0.650)	(0.516)	(0.513)	(0.000)	(0.000)	

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Source: Stata V14 Output.

The correlation test results show a positive relationship between market capitalization and the independent variable herd behavior (CSAD), ESG disclosure, and the interaction of ESG disclosure with herd behavior with values (0.243 - 0.218 - 0.259). Also, there is a positive relationship between the control variables: net income, company size, and company age (0.460, 0.188, 0.099). These relationships are statistically significant at a significance level of less than 0.1.

Before estimating study models, several tests are available to examine the validity of the proposed study model. The following are the most important tests used to evaluate the study model.

Table 4 :heteroskedasticity and Multivariate normality test

test	Model 1		Model 2	
	Chi2	prob	Chi2	prob
Breusch-Pagan test for heteroskedasticity	0.12	0.727	0.361	0.648
Multivariate normality Test – Doornik-Hansen	0.645	0.224	0.572	0.093
Hausman test	17.06	0.00	15.26	0.00

Source: Stata V14 Output.

Table (4) shows the difference between the variance tests (heteroskedasticity model 1 = 0.12, model 2 = 0.361). The p-values for both models are 0.727 and 0.648, greater than 0.05. This indicates that the study models do not have a problem with variance. Also, the Doornik-Hansen test results indicate that chi2 is 0.645 and 0.572, with a significant probability between 0.224 and 0.093. They are greater than 0.05, so the residuals follow a normal distribution.

The Variance Inflation Factor results range between 1 and less than 5, indicating that the regression models do not have a multicollinearity problem. Additionally, the mean Variance Inflation Factor for the models is 1.319 and 1.053, which is less than 5, indicating that the models are suitable for regression analysis.

Hausman's test prob chi2 value for model 1 and model 2 is 0.00, less than 0.05. So the best model is FEM because the p-value < 0.05. Accordingly, the regression analysis of the study model will be done using the fixed effects model

Discussion of First Model Results

Table (5) presented below shows the results of a linear regression (FEM) linking Market Capitalization with Herding behavior and 3 Control variables: net income, firm size, and firm age.

Table 5: Test herding behavior impact on firm performance

lMcap	coefficient	t-value	p-value	Sig
CSAD	0.244	2.03	0.04	**
lnincome	0.232	6.21	0.00	***
Fsize	-0.158	-2.04	0.04	**
Fage	0.107	2.91	0.00	***
Constant	13.636	30.39	0.00	***
R-squared	0.535	H01: There is no statistically significant impact between herding behavior and the firm market performance, as measured by market capitalization.		
F-test	5.246			
Prob > F	0.00			
*** p<.01, ** p<.05, * p<.1				

Source: Stata V14 Output.

The results of the regression analysis show that the value of the F-test is 5.246 with a statistical significance value of 0.00 at a significance level of 5%, indicating the significance of the estimated study model, and R^2 is 0.535, meaning 53.5% of the change in market capitalization is due to herd behavior (CSAD) and the control variables. The results of coefficient estimation indicate the

$$lMcap_{it} = 13.63 + 0.244\,(CSAD_{it}) + 0.232\,(lNincome_{it}) - 0.158\,(Fsize_{it}) + 0.107\,(Fage_{it})$$

following:

The positive value of the herd behavior coefficient (0.244) indicates that it has a significant positive effect on market capitalization. In other words, the more herd behavior there is, the greater the market capitalization. This is because investors tend to follow the behavior of others, which may lead to increased demand for stocks and raise their prices.

The research findings support previous research highlighting the positive influence of herding behavior on market capitalization, such as Bikhchandani & Sharma (2000), Shiller (2005), Siestat & Albuquerque (2008), and Changet al. (2014). This suggests that investor sentiment and herding can significantly impact company valuations, potentially leading to over or undervaluation.

The positive value of the net income coefficient (0.232) also indicates a significant positive effect on market capitalization. This means that the higher a company's net income, the higher its market capitalization. This is because net income indicates a company's profitability and ability to generate cash, making it more attractive to investors.

The negative value of the company size coefficient (-0.158) indicates that it significantly negatively impacts market capitalization. Accordingly, the larger the company, the lower its market capitalization. This is because larger companies tend to be more stable and less susceptible to price fluctuations, which may make them less attractive to investors looking for high returns.

The positive value of the company age coefficient (0.107) indicates that there is a significant positive effect on market capitalization. In other words, the older the company, the higher its market capitalization. This is because older companies tend to be more experienced and reliable, which may make them more attractive to investors.

Discussion of Second Model Results

Table (6) indicates that the value of the F-test is 10.70 with a statistical significance value of 0.00 at a significance level of 5%, indicating the significance of the estimated study model, and R^2 is 0.593, meaning 59.3% of the change in market capitalization is due to herd behavior (CSAD), ESG and control variables. The results of coefficient estimation indicate the following:

$$lMcap_{it} = 12.63 + 0.24\,(CSAD_{it}) + 0.124\,(Du\_ESG_{it}) + 0.216\,(ESG*CSAD_{it}) + 0.231$$
$$(lNincome_{it}) - 0.151\,(Fsize_{it}) + 0.087\,(Fage_{it})$$

Table 6: Test herding behavior impact on firm performance

lMCap	Coef.	t-value	p-value	Sig
CSAD	0.249	2.91	0.008	**
Du_ESG	0.124	2.68	0.000	**
ESG_Du_CSAD	0.216	3.63	0.000	**
Lnincome	0.231	6.17	0.000	***
Fsize	-0.151	-2.05	0.043	**
Fage	0.087	2.89	0.005	***
Constant	12.635	16.39	0.000	***
R-squared	0.593	H02: The ESG as a moderating variable does not have a statistically significant effect on the relationship between herding behavior and firm market capitalization.		
F-test	10.701			
Prob > F	0.00			
***p<.01, **p<.05, *p<.1				

Source: Stata V14 Output.

The positive value of the herd behavior coefficient (0.249) specifies that it has a positive and statistically significant effect on market capitalization. Herd behavior refers to investors' tendency to follow others' behavior in the market, which can lead to excessively high or low prices. In the case of market capitalization, the results indicate that herd behavior positively impacts market capitalization. This means that when investors start buying shares of a particular company, the stock price rises, increasing the company's market capitalization.

The positive value of ESG (0.124) also points to a positive and statistically significant impact on market capitalization. This means that companies with high ESG (i.e., companies that care about ESG) have a higher market capitalization.

ESG indicates a company's commitment to environmental, social, and governance practices. Companies with high ESG also tend to attract investors who care about non-financial factors, which leads to increased demand for the company's shares. This, in turn, contributes to a higher share price and increased market capitalization.

The positive value of the interaction of ESG and herd behavior (0.216) as a moderating factor in the relationship between the two study variables indicates that it has a positive and statistically significant effect on this relationship. This means that the positive impact of Herding on market capitalization is greater for companies that tend to disclose ESG than for other companies in the same industry.

5. Conclusion:

This study investigated the relationship between herding behavior and market capitalization in the Egyptian stock market EGX 30, in addition to the role of ESG disclosure as a moderating variable in this relationship. The sample consisted of 22 organizations according to the SP/EGX ESG index. Panel data analysis based on financial statements from 2018-2023 were used for statistical analysis. Herding was assessed by CSAD, and market cap was calculated by multiplying

a stock's price by its total outstanding shares. ESG disclosure was introduced as a dummy variable using Egypt's environmental, social, and corporate governance reports. Control variables were (Nincome) firm net income, (Fsize) Firm size, The natural logarithm of total assets, and (Fage) Firm age, the time between the initial creation of a firm and the present time.

Description and correlational analysis of research factors were utilized to explain and clarify the relationship among variables for the companies under study. Heteroskedasticity and multivariate normality tests showed no multicollinearity in regression models. Regression is appropriate because the models' mean Variance Inflation Factors are 1.319 and 1.053, below 5. Regression analysis showed that the F-test for the two models was 8.92 and 6.44, with a statistical significance value of 0.00 at 5%, confirming the importance of the estimated study models.

The market capitalization of the companies under study ranged from 1.16 million Egyptian pounds to 39.2 million Egyptian pounds from 2018 to 2020. After the ESG disclosure, the market capitalization increased, ranging from 2.04 million Egyptian pounds to 39.2 million Egyptian pounds from 2021 to 2023. Additionally, net income also improved after disclosing the ESG for these companies

The research findings support previous research highlighting the positive influence of herding behavior on market capitalization, such as Bikhchandani & Sharma (2000), Shiller (2005), Siestat & Albuquerque (2008), and Changet al. (2014). This suggests that investor sentiment and herding can significantly impact company valuations, potentially leading to over or undervaluation.

However, this study extends these findings by examining the impact of mandatory ESG disclosure regulations. Observing that the introduction of mandatory ESG disclosure strengthens the relationship between herding behavior and market capitalization. This contrasts with prior research suggesting ESG integration might mitigate herding Flammer & Sewerin (2018). This could be due to the Egyptian market dynamics. The Egyptian government enacts stricter environmental regulations, pushing companies toward ESG compliance (World Bank, 2020). Social movements advocating for sustainability could also be a factor (de Villiers, Plessis, & Messner, 2021). The global trend of investors prioritizing ESG factors is also relevant. Companies with strong ESG performance might attract more investment and potentially higher valuations. Investors increasingly view ESG as a marker of long-term risk management and profitability (Eccles et al., 2012). Egyptian companies that prioritize ESG could attract more investment and potentially higher valuations.

6. Limitations and Future Area Research

Although the study provided valuable insights, a few points still need to be highlighted. Our research exclusively focused on the Egyptian stock market. The findings may not be generalizable since various countries and financial markets may have different regulations and investing practices. Future research can examine comparable relationships in various market contexts to gauge the robustness of our findings.

Additionally, it is crucial to acknowledge that despite employing rigorous methodologies for data analysis, quantitative analysis is imperfect at documenting intricate behavioral phenomena. Similar to herding, behavioural biases are multifaceted and intricate. Frequently, they stem from qualitative characteristics that quantitative models may not fully capture. If we use qualitative research methods, such as surveys or interviews, we may learn more about the factors that influence investors' actions.

Thirdly, the impact of ESG disclosure and aggregating behaviour on market value was the only factor considered in our research. It failed to consider any other variables that may impact market dynamics. In the future, a complete picture of market behavior could be achieved if researchers investigated additional elements, such as corporate governance methods, industry-specific features, or macroeconomic indicators.

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