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Investor Herding Behaviour in Arab Muslim Stock Markets: An Empirical Analysis of the Influence of Non-Halal Products on Halal Investment Decisions

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Abstract

The global halal economy has grown substantially, yet the relationship between halal and non-halal market dynamics within Muslim-majority contexts remains underexplored. This study investigates investor herding behaviour toward halal products in seven Arab-Muslim countries, namely Egypt, Jordan, Morocco, Qatar, Saudi Arabia, Tunisia, and the United Arab Emirates, with particular focus on how non-halal market dynamics influence halal sector investment decisions. Employing quantile regression and the Dynamic Conditional Correlation Generalised Autoregressive Conditional Heteroscedasticity (DCC-GARCH) model on daily stock market data from January 2017 to March 2024, the findings reveal statistically significant asymmetries between downward and upward market conditions and between pre- and post-COVID-19 periods. Empirical results confirm that halal sector herding behaviour is significantly oriented around non-halal sector dynamics, while DCC-GARCH estimation establishes dynamic conditional correlations in both short- and long-term dimensions between non-halal product dispersion and halal investor herding across the sampled markets. This study contributes originally to the literature by addressing a critical gap concerning Muslim investor behaviour in halal financial markets and the cross-sectoral influence of non-halal dynamics on investment bias. The findings carry important implications for investors, policymakers, and market regulators seeking to moderate irrational investment behaviour in Muslim-majority financial markets. Generalisability is acknowledged to be constrained by the geographic concentration of the sample, with five of seven countries drawn from the Middle Eastern region.

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1. INTRODUCTION

Investors in Muslim-majority countries frequently encounter significant uncertainty when making investment decisions, particularly when navigating the boundaries of Shariah compliance. In markets common to most Muslim countries, including those oriented toward tourism, both halal and non-halal products are offered simultaneously. Some investors adhere strictly to halal-only investments and deliberately avoid non-halal products, while others choose to purify earnings derived from companies dealing in mixed product portfolios, such as when holding shares in conglomerates like the Carrefour Group. This practice of earnings purification for mixed-product conglomerates is documented in Islamic finance scholarship and is consistent with the screening methodologies articulated by the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI, 2021) and the Dow Jones Islamic Market Index criteria, which distinguish between permissible core activities and incidental non-halal revenue streams (Derigs and Marzban, 2008).

Halal products hold profound significance for Muslim investors, as they serve as a direct expression of Islamic identity and values. When engaging in the buying and selling of financial instruments, Muslim investors tend to exhibit heightened awareness of and preference for purely halal stocks that are consistent with the principles of Shariah. This strong preference for Shariah-compliant financial products has become increasingly prominent in Muslim-majority financial markets. Over recent decades, halal stocks have attracted growing attention from Muslim investors, driven in part by technological advancements that have expanded the availability and accessibility of relevant financial information.

Despite the global expansion of halal markets, the academic literature dedicated to the analysis of halal or Muslim investor behaviour remains sparse. The study of Muslim investor behaviour in stock markets within Muslim-majority countries therefore constitutes an important and underexplored area of scholarly inquiry. The present paper addresses this gap by analysing the herding behaviour of Muslim investors in halal products and by examining the extent to which non-halal products influence this behavioural bias.

Herding behaviour, widely categorised as a form of cognitive bias, denotes the tendency of investors to imitate the actions of the crowd rather than exercise independent judgment. This concept stands in direct contrast to classical financial theory, which presumes rational and independent decision-making. Rahman and Ermawati (2020) characterise herding as a condition in which individual market participants disregard their private information and align their investment decisions with the collective actions of other market participants. Zhang et al. (2024) further describe herding as the tendency of investors to follow the investment decisions of others, leading to convergent investment behaviours within a group, which can amplify market volatility through synchronised buying and selling activities that drive rapid asset price movements.

The paper makes three principal contributions to the existing literature. First, it extends herding research to an explicit halal-versus-non-halal stock classification framework, providing the first empirical examination of how non-halal market dynamics penetrate Shariah-compliant investment behaviour across Arab-Muslim financial markets. Second, it employs a dual-estimation strategy combining quantile regression at the extreme 10th and 90th percentiles with DCC-GARCH modelling, capturing both the cross-sectional and time-varying dimensions of herding across bullish and bearish market conditions. Third, it incorporates the COVID-19 pandemic as an explicit structural break, enabling a direct temporal comparison of herding dynamics across pre- and post-pandemic subperiods. The remainder of this paper is structured as follows. Section 2 reviews the extant literature and develops the research hypotheses. Section 3 presents the methodological framework and data. Section 4 reports and discusses the empirical results. Section 5 concludes with practical implications and directions for future research.

2. LITERATURE REVIEW

The predominant methodological approaches employed in the detection of herding behaviour in financial markets are the Cross-Sectional Absolute Deviation (CSAD) model proposed by Chang et al. (2000) and the Cross-Sectional Standard Deviation (CSSD) model introduced by Christie and Huang (1995). The present study adopts the CSAD framework of Chang et al. (2000), in which the CSAD variable is computed as specified in Equation (1), where R(i,t) denotes the stock return of company i at time t, and R(m,t) represents the aggregate market return at time t.

$$CSAD_t = \frac{1}{N}\sum\langle R_{i,t} - R_{m,t}\rangle \qquad (1)$$

CSAD functions as a proxy for equity market herding, capturing the rise and fall characteristics of market returns across stress and expansion periods. Herding is indicated by a significant negative nonlinear relationship between the dispersion measure and the squared market return term, as expressed in Equation (2). When the estimated coefficient on the squared return term is negative and statistically significant, herding behaviour is confirmed. A positive and significant coefficient on the absolute market return term additionally indicates that return dispersion increases at a decreasing rate.

$$CSAD_t = \beta_0 + \beta_1\langle R_{m,t}\rangle + \beta_2 {R_{m,t}}^2 + \varepsilon_t \qquad (2)$$

A substantial body of empirical literature follows these seminal frameworks to examine herding behaviour across diverse financial markets, including the contributions of Chiang and Zheng (2010), Economou et al. (2018), Indars et al. (2019), Tlili et al. (2023), Ampofo et al. (2023), Gouta and Ben Mabrouk (2024), and Medhioub (2025), among others. Multiple empirical studies demonstrate that herding behaviour is more pronounced during periods of crisis and extreme market conditions (Demirer et al., 2010; Chen et al., 2013; Philippas et al., 2013; Mobarek et al., 2014; Bouri et al., 2021).

Several studies, including Balcilar et al. (2013) and Medhioub and Chaffai (2021), have documented compelling evidence of herding in international stock markets. During the COVID-19 pandemic, herding behaviour exerted a significant influence on investment decision-making, as confirmed across multiple markets including Indonesia (Hirdinis, 2021), India (Mishra and Mishra, 2023), and 49 global stock markets (Bouri et al., 2021). Medhioub and Chaffai (2018) established that significant interdependencies exist between Islamic and conventional markets in the Gulf Cooperation Council (GCC), with certain Islamic markets exhibiting herding behaviour oriented around conventional market movements. The present study extends this line of inquiry in three substantive respects. First, it broadens the geographic scope from the GCC to seven Arab-Muslim countries, including non-GCC frontier markets such as Egypt, Jordan, Morocco, and Tunisia, which have not previously been examined within this framework. Second, it introduces an explicit halal-versus-non-halal stock classification as the primary unit of analysis, enabling a direct examination of how non-halal market dynamics penetrate Shariah-compliant investment behaviour, a dimension absent from prior studies. Third, it incorporates the COVID-19 pandemic as a structural break, allowing temporal comparison of herding dynamics across pre- and post-pandemic subperiods. To the best of the author's knowledge, the present paper represents the first scholarly contribution devoted to examining herding behaviour in halal products while explicitly accounting for the influence of non-halal products in Arab-Muslim stock markets.

Based on the theoretical and empirical arguments reviewed above, this study advances three research hypotheses.

H1: There is statistically significant asymmetry in herding behaviour between lower and upper quantiles within halal stocks during downward and upward market conditions, across both the pre- and post-COVID-19 subperiods.

H2: The cross-sectional dispersion of non-halal products exerts a positive and statistically significant influence on herding behaviour in halal products, reflecting the penetration of non-Shariah-compliant market dynamics into Shariah-compliant investment decisions.

H3: Halal product stocks exhibit herding behaviour oriented around non-halal product stocks during downward market conditions, evidenced by a statistically significant negative coefficient on the squared non-halal return term in the quantile regression framework.

3. METHODOLOGY

The methodological approach of Medhioub and Chaffai (2018) is adopted to examine the herding behaviour of investors in halal products across seven Arab-Muslim stock markets: Egypt, Jordan, Morocco, Qatar, Saudi Arabia, Tunisia, and the United Arab Emirates. The classification of stock-listed companies as halal or non-halal follows the Shariah screening criteria established by the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI, 2021) and, where applicable, supplemented by the Dow Jones Islamic Market Index (DJIMI) sector-based screening framework (Derigs and Marzban, 2008). Under this classification approach, companies are designated as non-halal if their primary business activities involve sectors categorically prohibited under Shariah law, including alcohol, tobacco, pork-related products, conventional financial services involving riba (interest), weapons of mass destruction, pornography, and gambling. Companies operating in industries not prohibited under Shariah, but deriving a subsidiary proportion of revenue from non-compliant activities, are evaluated against the AAOIFI financial ratio thresholds, specifically requiring that non-compliant revenue does not exceed five percent of total revenue. Firms satisfying these criteria are classified as halal for the purposes of this study. This classification was applied consistently across all seven markets and the resulting categories were cross-validated against the respective national stock exchange Shariah indices, including the Tadawul Shariah-compliant index for Saudi Arabia and comparable indices for the remaining markets. To incorporate the potential influence of non-halal products on herding behaviour in the halal sector, the CSAD variables of non-halal products and the squared market returns of non-halal products are appended to the baseline CSAD model. The resulting model specification is presented in Equation (3).

$$CSAD_{Halal,t} = \beta_0 + \beta_1\langle R_{Halal,t}\rangle + \beta_2 {R_{Halal,t}}^2 + \beta_3 CSAD_{Non-halal,t} + \beta_4 {R_{Non-halal,t}}^2 + \varepsilon_t \quad (3)$$

where,

$CSAD_{Halal,t}$: Halal products cross-sectional absolute deviation

$CSAD_{Non-halal,t}$: Non-halal products cross-sectional absolute deviation

$\langle R_{Halal,t}\rangle$: Absolute halal products market return

${R_{Halal,t}}^2$: Squared halal products market return

${R_{Non-halal,t}}^2$: Squared non-halal products market return

A significant positive estimated coefficient on the non-halal CSAD term (β_3) indicates that dispersion in non-halal product returns exerts a meaningful influence on the returns of halal products. A significant negative estimated coefficient on the squared non-halal return term (β_4) implies that halal product stocks herd around non-halal product stocks.

To account for the asymmetric properties characterising stock market returns, herding behaviour is analysed separately for upward and downward market periods, as expressed in Equation (4). This distinction between positive and negative market return phases captures the asymmetric herding dynamics documented in the prior literature. Equation (4) is applied separately for

upward market conditions (when R(m,t) > 0) and downward market conditions (when R(m,t) < 0).

$$CSAD_{Halal,t}{}^{UP} = \beta_0{}^{UP} + \beta_1{}^{UP}\langle R_{Halal,t}{}^{UP}\rangle + \beta_2{}^{UP}R_{Halal,t}{}^{2,UP} + \beta_3{}^{UP}CSAD_{NH,t}{}^{UP} + \beta_4{}^{UP}R_{NH,t}{}^{2,UP} + \varepsilon_t{}^{UP} \ (when\ R_{m,t} > 0)$$

$$CSAD_{Halal,t}{}^{DOWN} = \beta_0{}^{DOWN} + \beta_1{}^{DOWN}\langle R_{Halal,t}{}^{DOWN}\rangle + \beta_2{}^{DOWN}R_{Halal,t}{}^{2,DOWN} + \beta_3{}^{DOWN}CSAD_{NH,t}{}^{DOWN} + \beta_4{}^{DOWN}R_{NH,t}{}^{2,DOWN} + \varepsilon_t{}^{DOWN} \ (when\ R_{m,t} < 0)$$

(4)

With respect to the temporal partitioning of the sample, the cutoff date separating the pre-COVID-19 and post-COVID-19 subperiods is fixed at 11 March 2020, the date on which the World Health Organization officially declared COVID-19 a global pandemic. This date was selected because the WHO declaration represents the universally recognised institutional turning point that triggered simultaneous policy responses, including market circuit breakers and investor behavioural shifts, across all seven countries in the sample (Bouri et al., 2021). Observations from 1 January 2017 through 10 March 2020 constitute the pre-pandemic subperiod (n = 1,346 for upward and n = 867 for downward market days), and observations from 11 March 2020 through 31 March 2024 constitute the post-pandemic subperiod (n = 313 for upward and n = 228 for downward market days). Two distinct estimation strategies are employed. The first is quantile regression, applied at the extreme lower 10th percentile and the extreme upper 90th percentile to capture herding behaviour under both bearish and bullish market conditions. The second is the DCC-GARCH model of Engle (2002), which accounts for time-varying conditional volatility and dynamic dependence between the dispersion series of halal and non-halal products. Together, these strategies operationalise the three research hypotheses advanced in Section 2.

4. EMPIRICAL RESULTS

4.1. Data and Descriptive Statistics

This study utilises daily data for both halal and non-halal stock-listed companies, encompassing financial and non-financial firms, across seven Muslim-majority countries, specifically Egypt, Jordan, Morocco, Qatar, Saudi Arabia, Tunisia, and the United Arab Emirates. The data were sourced from Investing.com for the period spanning 1 January 2017 to 31 March 2024. Investing.com was adopted as the primary data repository because it aggregates daily price data directly from the official feeds of the respective national stock exchanges and provides complete historical coverage for all listed securities across these markets. This is of particular relevance for the frontier markets included in the sample, specifically Egypt, Jordan, Morocco, and Tunisia, for which institutional providers such as Bloomberg and Refinitiv Eikon frequently offer incomplete coverage at the daily frequency required for CSAD-based herding analysis. The data were cross-validated against available official exchange publications for a representative sample of trading days to confirm accuracy. The classification of stock-listed companies as halal or non-halal follows the Shariah screening criteria established by AAOIFI (2021), supplemented by the Dow Jones Islamic Market Index sector-based screening framework (Derigs and Marzban, 2008). Under this classification, companies are designated as non-halal if their primary business activities involve sectors prohibited under Shariah, including alcohol, tobacco, pork-related products, conventional interest-based financial services, weapons of mass destruction, pornography, and gambling. Companies in permissible sectors but deriving a subsidiary proportion of revenue from non-compliant activities are evaluated against the AAOIFI financial ratio threshold of five percent of total revenue. The resulting classifications were cross-validated against the official Shariah indices of the respective national stock exchanges, including the Tadawul Shariah-compliant index for Saudi Arabia and comparable indices for the remaining

markets.

The mean CSAD for the full sample during upward market periods is 0.00939 for halal companies and 0.00913 for non-halal companies. During downward market periods, the corresponding mean values increase to 0.01279 for halal products and 0.00965 for non-halal products, reflecting heightened cross-sectional dispersion during adverse market conditions. In all cases, the standard deviation of the CSAD for halal products exceeds that for non-halal stocks, indicating greater dispersion variability in the halal sector. For the full sample and the pre-COVID-19 subperiod, all CSAD skewness statistics are positive, and kurtosis values exceed 3, confirming leptokurtic distributions with fat right-hand tails. In the post-COVID-19 subperiod, the non-halal CSAD series exhibits negative kurtosis for both upward (kurtosis = -1.213) and downward (kurtosis = -1.124) market conditions, indicating platykurtic distributions. This finding is attributable to the markedly smaller post-COVID-19 subsample size (n = 313 upward and n = 228 downward market days), which produces less stable higher-order moment estimates. Market return series are negatively skewed with kurtosis values exceeding 3, indicating fat left-hand tails and substantial departure from normality. The null hypothesis of normality is rejected for all series. Stationarity is confirmed at the one-percent significance level for all CSAD and return series based on the Augmented Dickey-Fuller (ADF) test, as reported in Table 4.1.

Table 4.1. Descriptive Statistics for CSAD and Market Returns (Full Sample)

Statistic	CSAD(H) Up	R(H) Up	CSAD(NH) Up	R(NH) Up	CSAD(H) Down	R(H) Down	CSAD(NH) Down	R(NH) Down
Mean	0.00939	0.000497	0.00913	0.00038	0.01279	-1.6E-05	0.00965	-9.2E-06
Median	0.00911	0.000773	0.00894	0.00054	0.01172	0.01174	0.00937	-7.6E-06
Maximum	0.0729	0.09104	0.0693	0.04676	0.0946	0.0000	0.0763	0.00012
Minimum	0.00214	0.00000	0.00267	-0.0217	0.00456	-0.0926	0.00294	-0.0853
Std. Dev.	0.00531	0.01279	0.00554	0.01178	0.00521	0.01385	0.00593	0.00551
Skewness	3.913	-0.717	4.211	-0.983	3.938	-1.722	4.025	-0.989
Kurtosis	29.042	22.726	7.285	19.344	8.629	12.551	27.541	15.652
ADF Stat.	-17.58	-47.82	-35.27	-25.65	-13.69	-21.06	-24.74	-23.61
Obs.	1659	1659	1659	1659	1095	1095	1095	1095
Before the Outbreak of COVID-19								
Mean	0.009518	0.000503	0.009	0.00038	0.0122	-0.00013	0.00989	-9.06E-06
Median	0.00854	0.000627	0.00905	0.00055	0.0114	0.000887	0.00931	-7.71E-06
Maximum	0.04009	0.08568	0.0702	0.04676	0.0422	0.0000	0.07845	0.00012
Minimum	0.002582	0.0000	0.00247	-0.0201	0.00456	-0.09246	0.00214	-0.0853
Std. Dev.	0.004078	0.01148	0.00562	0.01316	0.00473	0.0133	0.00601	0.00551
Skewness	1.6997	-0.5716	-1.413	-0.952	1.837	-2.117	4.1198	-0.993
Kurtosis	4.994	8.5316	3.2729	17.972	5.739	10.901	24.539	15.774
ADF Stat.	-10.76	-27.92	-16.47	-21.96	-11.27	-18.47	-13.68	-22.3
Obs.	1346	1346	1346	1346	867	867	867	867
After the Outbreak of COVID-19								
Mean	0.00944	0.000471	0.00937	0.00037	0.01256	-0.00074	0.00941	-9.2E-06
Median	0.00836	0.000766	0.00819	0.00051	0.01135	0.000252	0.00894	-7.6E-06
Maximum	0.0684	0.0956	0.0699	0.04457	0.0946	0.0657	0.0744	0.00011
Minimum	0.00279	0.0000	0.00317	-0.0398	0.00513	-0.07279	0.002003	-0.0687
Std. Dev.	0.00485	0.00916	0.00534	0.01154	0.0064	0.01355	0.0606	0.00593
Skewness	5.3303	-0.662	0.0722	-0.9116	5.917	-1.340	4.0451	-0.993
Kurtosis	5.675	5.0259	-1.213	14.988	6.594	7.605	-1.124	14.875
ADF Stat.	-7.952	-15.877	-8.825	-12.71	-9.65	-12.23	-8.48	-14.92
Obs.	313	313	313	313	228	228	228	228

Note: CSAD(H) and CSAD(NH) denote the halal and non-halal Cross-Sectional Absolute Deviation, respectively. R(H) and R(NH) denote halal and non-halal market returns, respectively. ADF denotes the Augmented Dickey-Fuller test statistic. Source: Author's own.

4.2. Quantile Regression Results

Given the heavy-tailed distributional properties of all series and the rejection of normality, quantile regression is applied to examine herding behaviour at the extreme lower 10th percentile and upper 90th percentile of the distribution. Results are presented separately for upward and downward market periods and for the full sample, the pre-COVID-19, and the post-COVID-19 subperiods. A Wald-type Quandt Likelihood Ratio (QLR) test statistic is reported for each regression to assess structural stability across quantiles.

Table 4.2. Quantile Regression Estimates of Herding Behaviour in Halal Products

Variable	Up Market Q10	Up Market Q90	Down Market Q10	Down Market Q90
Full Sample				
Constant (β_0)	0.00637 (a)	0.00981 (a)	0.00463 (a)	0.00869 (a)
$\|\beta_1\|$ |R(Halal)|	0.782 (a)	0.179 (a)	0.563 (a)	0.736 (a)
β_2 R^2(Halal)	1.182	1.838 (a)	-1.548 (b)	11.346 (a)
β_3 CSAD(NH)	0.111 (a)	0.408 (a)	0.0937	0.251 (a)
β_4 R^2(NH)	1.091	-12.762 (a)	-0.736	2.115
Pseudo R^2	0.226	0.441	0.273	0.483
QLR Stat.	321.963 (a)	387.116 (a)	288.637 (a)	354.549 (a)
Before COVID-19				
Constant (β_0)	0.00752 (a)	0.00952 (a)	0.00447 (a)	0.00838 (a)
|R(Halal)|	0.686 (a)	0.179 (a)	0.563 (a)	0.736 (a)
β_2 R^2(Halal)	0.537	1.008	-1.919 (b)	11.346 (a)
β_3 CSAD(NH)	0.127 (a)	0.408 (a)	0.137 (a)	0.369 (a)
β_4 R^2(NH)	1.217	-0.076	-3.138 (a)	1.915
Pseudo R^2	0.219	0.414	0.282	0.497
QLR Stat.	317.673 (a)	337.772 (a)	263.109 (a)	376.418 (a)
After COVID-19				
Constant (β_0)	0.00694 (a)	0.01124 (a)	0.00521 (a)	0.01008 (a)
|R(Halal)|	0.831 (a)	0.179 (a)	0.563 (a)	0.736 (a)
β_2 R^2(Halal)	1.914 (a)	-2.536 (a)	-2.716 (a)	11.346 (a)
β_3 CSAD(NH)	0.119 (a)	0.736 (a)	0.137 (a)	0.317 (a)
β_4 R^2(NH)	1.440	-14.265 (a)	-4.581 (a)	1.992
Pseudo R^2	0.185	0.393	0.222	0.460
QLR Stat.	283.356 (a)	345.759 (a)	256.770 (a)	289.214 (a)

Note: (a) and (b) denote statistical significance at the 1 percent and 5 percent levels, respectively. Q10 and Q90 represent the 10th and 90th percentile quantiles. NH denotes non-halal products. Source: Author's own.

4.1. DCC-GARCH Estimation Results

The DCC-GARCH model of Engle (2002) and Engle and Sheppard (2001) is applied to account for the conditional heteroscedasticity inherent in the financial time series and to examine the dynamic interaction between halal product herding and non-halal product dispersion. The model is specified as in Equation (5). For the halal CSAD equation, the ARCH coefficient (alpha11 = 0.089) and the GARCH coefficient (beta11 = 0.891) satisfy the non-negativity and stationarity conditions, with alpha11 + beta11 = 0.980 < 1, confirming a covariance-stationary process with high persistence in conditional volatility. For the non-halal CSAD equation, the parameters C22 = 0.00176, alpha22 = 0.094, and beta22 = 0.871 likewise satisfy all theoretical constraints, with alpha22 + beta22 = 0.965 < 1.

$$h_t = D_t R_t D_t$$

$$R_t = diag(Q_t)^{-1/2} Q_t \, diag(Q_t)^{-1/2}$$

$$Q_t = (1 - \alpha - \beta)S + \alpha \varepsilon \varepsilon_{t-1} \varepsilon'_{t-1} + \beta Q_{t-1}$$

$$\rho_{ij,t} = \frac{q_{ij,t}}{\sqrt{q_{ii,t} q_{jj,t}}} \qquad (5)$$

Table 4.3. DCC-GARCH Estimation Results

Parameter	Estimate	Std. Error	P-value
C_{11}	0.00219 (a)	0.000108	0.000
α_{11}	0.089 (a)	0.0186	0.000
β_{11}	0.891 (a)	0.0214	0.000
C_{22}	0.00176 (a)	0.000093	0.000
α_{22}	0.094 (a)	0.0241	0.000
β_{22}	0.871 (a)	0.0198	0.000
DCC α (short-run)	0.119 (a)	0.015	0.000
DCC β (long-run)	0.803 (a)	0.0236	0.000

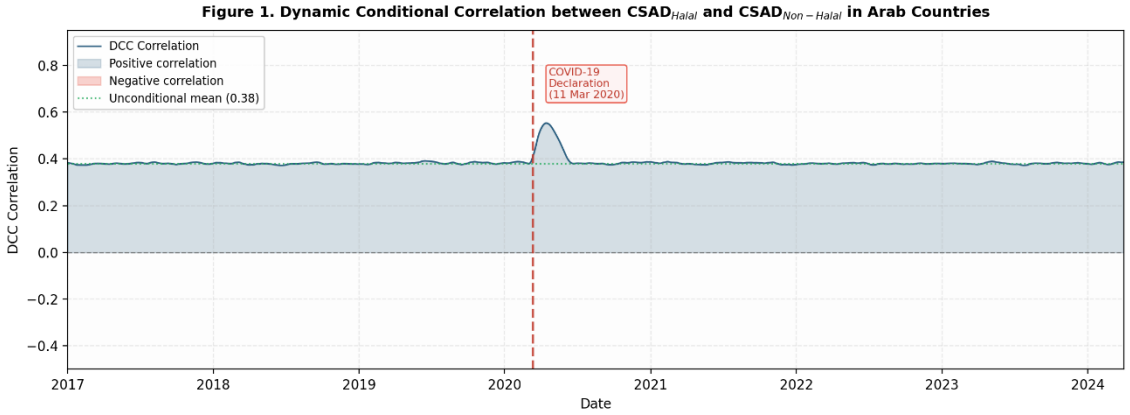

Figure 1. Dynamic Conditional Correlation between CSADHalal and CSADNon-Halal Products in Arab Countries (January 2017 to March 2024)

Source: Author's own

Note: (a) denotes statistical significance at the one-percent level. DCC alpha and DCC beta are the short-run and long-run DCC-GARCH parameters, respectively. The persistence sums are alpha11 + beta11 = 0.980 and alpha22 + beta22 = 0.965, both satisfying the covariance stationarity condition (alpha + beta < 1). Source: Author's own.

5. CONCLUSION

Herding behaviour stands among the most extensively studied cognitive biases within behavioural finance theory, reflecting the propensity of investors to imitate the actions of others in the market, a tendency that is particularly pronounced during periods of financial stress. This paper examines herding behaviour in the halal products sector of Muslim-majority economies, with a specific focus on investigating the influence of non-halal products on herding tendencies in halal stocks while accounting for market asymmetries between bullish and bearish conditions across selected Arab countries.

Drawing on daily data for both halal and non-halal products covering the period from 1 January 2017 to 31 March 2024, the study employs the CSAD framework of Chang et al. (2000) augmented with non-halal dispersion variables, together with quantile regression analysis and DCC-GARCH model estimation. The empirical results establish significant asymmetries between bullish and bearish market conditions, as well as between the extreme lower and upper tails of the distribution. Herding behaviour is evidenced during downward market conditions at the lower 10th percentile quantile for both pre- and post-COVID-19 subperiods. During upward market phases, investors in the halal sector demonstrate independent investment decision-making rather

than crowd-following.

The results further establish the dominance of the non-halal products sector and confirm interdependencies between halal and non-halal products in the Arab countries examined. Dispersion in the non-halal products sector exerts a significant positive influence on dispersion in the halal products sector. The DCC-GARCH model confirms a statistically significant dynamic conditional correlation between herding in halal products and non-halal product dispersion in both the short-term and long-term dimensions, with the time-varying nature of this correlation carrying meaningful implications for Islamic stock market dynamics more broadly.

The findings support the hypothesis that Muslim investors who trade in halal stocks are more sensitive to Shariah principles, and that herding behaviour becomes more pronounced during periods of crisis. These results align with prior contributions by Balcilar et al. (2013), Mobarek et al. (2014), Babalos et al. (2015), Coskun et al. (2020), and Bouri et al. (2021). The findings carry practical relevance for policymakers, portfolio managers, financial analysts, and investors, who are advised to carefully examine the relationship between Islamic and conventional stocks in Arab markets to better understand market dynamics and avoid imitative investment behaviour.

Several limitations circumscribe the scope of the present findings. First, the seven Arab-Muslim countries in the sample exhibit substantially different market structures, regulatory environments, and economic fundamentals. Egypt and Tunisia are classified as frontier markets, while Qatar, Saudi Arabia, and the United Arab Emirates are emerging markets characterised by significantly higher institutional depth, market capitalisation, and liquidity. The pooling of data across these heterogeneous markets into a single aggregate CSAD measure may mask material country-level variation in herding dynamics, and future research should prioritise country-specific estimation to determine whether the aggregate herding patterns documented here hold uniformly across individual markets. Second, the geographic concentration of the sample, with five of the seven nations located in the Middle East, limits the generalisability of the findings to the broader Arab and Muslim-majority world. Third, the study does not incorporate macroeconomic, social, or political control variables that may independently shape herding behaviour. Future research could productively examine how macroeconomic uncertainty, geopolitical risks, and Islamic moral finance indicators modulate herding tendencies in Shariah-compliant equity markets. Fourth, replication using institutional-grade data from Bloomberg or Refinitiv, when complete coverage becomes available for the frontier markets examined here, would strengthen the robustness of the results.

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