REITS IN THE SAUDI STOCK MARKET AND THE IMPACT OF COVID-19 CRISIS

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Abstract

This paper analyses the relationship between REITs trading volume, REITs returns and stock market returns over the period starting end of 2016 till mid of 2022. The results of VAR test and Granger causality test, for the whole sample, support the Return Chasing Hypothesis (RCH). Investors in REITs, in the Saudi stock market, rely in their investment decisions on REITs previous returns. Their low informativeness regarding REITs drive them to chase its returns. Splitting the sample into pre and post COVID-19 crisis periods don't provide support for neither the RCH nor the Information Hypothesis (IH). More informed, institutional, investors are attracted to invest in the stock market due to the major developments that occur in the Saudi stock exchange (TADAWUL) after the crisis. This had reduced the return chasing behavior of investors in the market, but still the informational and stabilizing role of institutional investors is not attained.

Keywords

INTRODUCTION

Investments in mutual funds experienced a massive growth in recent years due to the high capital flows from investors into these funds. The attractiveness of mutual funds results from its high liquidity, diversified investment opportunities, professional asset management, and low management cost. The high growth of mutual funds attracted researchers to analyze the drivers behind the fund's capital flows and its impact on stock market returns (Latief and Shah 2014; Aydoğan, Vardar, and Tunç 2014). In the context of Saudi Arabia, the Saudi stock market witnessed in recent years high growth and development in its regularity framework. Listing the Real Estate Investment Trusts (REITs) in the local stock exchange (Tadawul) as of 2016 is considered one of these required developments to attract more qualified investors to the market. As this decision considered recent, few research papers analyze REITs performance in the Saudi context (Alsharif 2021). Therefore, this paper intends to fill the gap through analyzing the relationship between REITs trading volume, its returns and stock market returns. Several theoretical models are developed to explain the relationship between trading volume and returns (Jensen 1978; Harris and Gurel 1986). According to the Price Pressure Hypothesis (PPH), shifts in demand curves lead to a short-term price change (Kvamvold 2017; Mihov 2019). The Information Hypothesis (IH) implies a positive relationship runs from cash-flows to returns, due to private useful information the investors possess (Ülkü and Weber 2013; Latief and Shah 2014). The Return Chasing Hypothesis (RCH) assumes that investors tend to chase returns when taking their investment decisions (Babalos, Caporale, and Spagnolo 2019; Zhu and Woltering 2021). This paper should contribute to the literature that analyze the dynamic relationship between REITs trading volume, REITs returns and market returns. Investigating this relationship before and after COVID-19 crisis is another goal the paper attempt to assess. Investors are attracted to invest in stable and fairly priced markets where information is quickly transmitted to prices (Adhikari 2020). Therefore, defining whether investing in REITs is driven by its fundamentals, private information or return chasing is important for investors in the Saudi stock market. Besides that, analyzing this relationship before and after COVID-19 crisis is crucial to determine the stability of the market.

  The importance of this paper results from its focus on REITs investments that is considered recent in the Saudi stock market. To determine whether REITs volume drives returns or returns drive volume is important for Saudi stock market: a) investors to assess them on taking better investment decisions through understanding the drivers behind REITs investments. b) officials to improve the regularity framework required to attain market

stability and efficiency. The Saudi Stock Exchange (Tadawul) is going through major developments, in accordance with the Saudi government's Vision-2030 goals, to become an advanced capital market (www.vision2030.gov.sa). The Exchange completed the process of joining three global leading indexes, including FTSE, MSCI and S&P Dow Jones. Besides that, the exchange officials are working toward creating an efficient platform through attracting more foreign investors and promoting more asset classes. Therefore, understanding the drivers behind REITs investments and its impact on returns is required to facilitate the stock market development and the achievement of Vision-2030 goals.

The paper covers the period staring end of 2016 till mid of 2022. The results, for the whole sample, support the Return chasing Hypothesis (RCH). The Saudi stock market is dominated with individual investors. When they invest in REITS, their low informativeness drive them to chase REITs previous returns. Splitting the sample into pre and post COVID-19 crisis periods don't provide support neither for the RCH nor the IH. The major developments Tadawul is going through had reduce the chasing of return behavior in the market and attract more institutional investors, but their informational and stabilizing role is still not attained.

The rest of the paper is organized as follows. Section 2 reviews the related literature. Section 3 presents the data and definitions of the variables under study. Section 4 describes the methodology applied. Section 5 summarizes the results of the analysis. Section 6 concludes the study and presents its limitations and possibilities for future research.

REVIEW OF LITERATURE

The Efficient Market Hypothesis (EMH), proposed by Jensen (1978), presumes that stock prices reflect all available information. Therefore, different securities are prefect substitutes and, if no new information is conveyed, the market can absorb demand and supply shocks without changes in security prices. There are several hypotheses that contradict the EMH. The Price Pressure Hypothesis (PPH) assumes that the imperfect substitution of different securities leads to changes in prices, even if new information is not carried (Harris and Gurel 1986). Market shocks lead to immediate price change due to a short-term shift in the demand curve. In the long-run, prices are reversed back to its equilibrium level. The information Hypothesis (IH) implies that the private superior information investors possess is useful for the market (Parker 1978). It tends to drive cash-flows into the market and push its returns up. Therefore, a positive relationship runs from cash-flows to returns. The Return Chasing Hypothesis (RCH) also challenges the EMH (DeLong et al. 1990). Investors either chase past performance or future performance when taking their investment decisions. They allocate funds to previously well performed investments when they follow past performance (Barberis and Shleifer 2003). While rational speculators, according to DeLong et al. (1990), tend to invest in securities that are expected to increase in value in the future. This should push security prices away from its fundamental values and destabilize the market.

Several research papers provide support for the Price Pressure Hypothesis (PPH) (Harris and Gurel 1986; Glascock and Lu-Andrews 2015; Kvamvold 2017; Mihov 2019; Liu and Lu 2020). Harris and Gurel (1986) reveal in their study that current US stock market returns are negatively affected by previous stock's cash-flows. The investment decisions of US investors tend to fluctuate market returns. The study of Kvamvold (2017) shows that monthly returns of mutual funds understudy increase when unexpected net flows into these funds increase. Mihov (2019) find that forming an activist position leads into upward pressure on the price of target stocks and a deviation from fundamental level takes place in the short-run. As the pressure declines, prices reverse to its fundamental levels in the long-run. The study of Glascock and Lu-Andrews (2015) supports the PPH. During extreme market events, large size REITs with high liquidity seize information more quickly and reverse back rapidly after the event. Larson (2005) reveal that the one large decline in REITs price, on the day of the release of unfavorable information, is associated with price reversal in the next two days. The findings of Liu and Lu (2020) show that buying and selling REITs with an upward and downward continuing overreaction, respectively, leads to positive returns. This pattern of returns doesn't continue, rather, it reverses in the long-run.

Some other papers are in support for the Information Hypothesis (IH) (Jank 2012; Ülkü and Weber 2013; Latief and Shah 2014). The study of Latief and Shah (2014), in the context of Pakistan, reveals that mutual fund herding affects positively and significantly on stock returns. This might result from gathering similar information from well-informed resources by fund managers and, as a result, they trade in the same direction. The positive correlation between unexpected fund flows and market returns, found by Jank (2012), implies the occurrence of informational content in fund flows that drive returns up. Ülkü and Weber (2013) find a positive unidirectional relationship runs from Korean mutual fund flows to market returns. Foreign investors in Korean mutual funds have superior information that allow them to generate high returns. Other papers provide support for the Return Chasing Hypotheses (RCH) (Ling and Naranjo 2006; Baquero and Verbeek 2015; Lobão and Levi 2016; Gong 2019; Babalos, Caporale, and Spagnolo 2019; Zhu and Woltering 2021). Lin and Yung (2006) findings don't support a downward demand curve for REITs, rather, REITs returns attract REITs capital flows. Ling and Naranjo (2006) find a positive and significant impact of prior fund returns on REIT mutual fund flows. Baquero and Verbeek (2015) reveal that fund flows follow performance streaks. Investors tend to generate lower returns from following these streaks compared to the returns they can generate from analyzing historical performance. Lobão and Levi

(2016) conduct their research on the Portuguese context. Their results reveal that stock returns affect positively and significantly on mutual fund flows. Gong (2019) find that investors consider recent returns when taking their investment decisions which support the investor's representativeness bias. The results of Bablos Caporale, and Spagnolo (2019) disclose a causal relationship runs from US stock market returns to equity fund cash-flows after the financial crisis period. Zhu and Woltering (2021) analyze the spillover effect of flows into connected mutual funds on the performance of individual mutual funds. The results show a positive and significant impact of monthly expected flows of connected funds on annualized excess returns of individual funds.

Some researchers provide support for multiple hypotheses (Yangbo et al. 2010; Aydoğan Vardar, and Tunç 2014). The study of Yangbo et al. (2010) provide evidence that support the existence of positive and significant impact of aggregate equity mutual fund flows on excess stock market returns in both Hong Kong and Singapore, which provide support for the Information Hypothesis. This study also provide support for the Return Chasing Hypothesis. The findings reveal the prevalence of an impact of excess stock market returns on aggregate mutual fund flows, and this effect is more pronounced in Hong Kong than Singapore. Similarly, Aydoğan Vardar, and Tunç (2014) find in their research the persistence of a bidirectional causality between mutual fund flows and stock returns. Their findings prove the existence of a statistically significant positive relationship between lagged stock index returns and current mutual fund flows, which support the Return Chasing Hypothesis. In support for the Information Hypothesis, the findings reveal a positive and significant relationship between lagged fund flows and current stock index returns.

The Saudi stock exchange (TADAWUL) is going through major developments, in accordance with the Saudi government's Vision 2030 goals (www.vision2030.gov.sa). Promoting the market into an emerging one as of 2019 and broadening its asset classes should attract more qualified investors and endorse its efficiency and stability (www.saudiexchange.sa). Introducing the REITs into the market as of 2016 should facilitate its development and the achievement of Vision 2030 goals. Therefore, REITs trading volume and its returns might be informative and can affect market returns. Hence, a causal relationship is expected to occur between REITs trading volume, REITs returns and market returns.

DATA AND VARIABLES

To analyze the relationship between REITs trading volume, its returns and stock market returns, data is extracted from the Saudi stock exchange website (www.saudiexchange.sa). The main index in the Saudi stock market is Tadawul All Share Index (TASI) and it is an all-share index based on a free float methodology. Trading volume is measured as the log value of number of REITs shares traded in the market. Market returns and REITs returns are measured based on TASI and REITs indices, respectively. Return is calculated as the difference between the logarithm of end-of-day index value minus the logarithm of its value in the previous day (Yangbo et al. 2010). The variables under study are measured on a daily basis, with total number of observations equal to 1395.

Real Estate Investment Trusts (REITs) are listed in the Saudi stock exchange (Tadawul) as of end of 2016. Therefore, this paper covers the period starting 13th of November, 2016 till 13th of June, 2022. This period is chosen to cover the impact of COVID-19 crisis on the relationship understudy. It's important to analyze this relationship considering this major event to quantify the stability of the market during such events.

METHODOLOGY

Time series data should be stationary. Therefore, the stationarity of the variables under study should be tested to analyze the causality between REITs trading volume, its returns and stock market returns. The Augmented Dickey-Fuller (ADF) test, proposed by Dickey and Fuller (1979), and Phillips-Perron (PP) test, proposed by Phillip and Perron (1988), are applied to check the stationary of variables understudy. Both models are unit-root. The ADF test, unlike the PP test, adds lag variables for the dependent variable to detect if a serial correlation occurs in the error term. The following model is applied for the Augmented Dickey-Fuller (ADF) test:

$$\Delta y_t = \alpha + \beta_t + \gamma\, y_{t-1} + \sum \delta_i \Delta y_{t-1} + \varepsilon_t \qquad (1)$$

where y_t is either REITs trading volume, REITs returns or stock market returns. α, β, γ and δ are model parameters and ε_t is a white noise error term. If $\delta = 0$, the null hypothesis indicates that the data series is not stationery and unit-root exist.

While, the following model is used for the PP test:

$$\Delta y_t = \alpha + \beta_t + \gamma\, y_{t-1} + \varepsilon_t \qquad (2)$$

where, y_t is either REITs trading volume, REITs returns or stock market returns. α, β and γ are model parameters and ε_t is a white noise error term. If $\gamma = 0$, the null hypothesis indicates that the data series is not stationery and unit-root exist.

If the results of unit-root test reveal that the variables are stationary, Vector Autoregression model (VAR) and Granger causality test are applied to define the direction of relationship between REITs trading volume, REITs returns and stock market returns. A set of criteria, including Akaike information criterion (AIC), Hannan–Quinn information criterion (HQI) and Bayesian information criterion (SBIC) are used to define the number of lags for the variables understudy. The optimal number of lags is defined based on the criteria that provide the lowest significant value.

A bivariate VAR model, using OLS method, is applied to measure the direction of relationship between the variables understudy (Yangbo et al., 2010):

$$V_t = a + \sum \alpha_i V_{t-1} + \sum \beta_i R_{t-1} + \sum \delta_i RM_{t-1} + \varepsilon_i \qquad (3)$$

$$R_t = b + \sum \alpha_i V_{t-1} + \sum \beta_i R_{t-1} + \sum \delta_i RM_{t-1} + \varepsilon_i \qquad (4)$$

$$RM_t = d + \sum \alpha_i V_{t-1} + \sum \beta_i R_{t-1} + \sum \delta_i RM_{t-1} + \varepsilon_i \qquad (5)$$

Where V_t, R_t and RM_t denote REITs trading volume, REITs returns and stock market returns, respectively. The parameters α_i, β_i, and δ_i in model (3) represent the impact of previous REITs volume, REITs returns and stock market returns, respectively, on current REITs volume. If all parameters are statistically significant, it is concluded that past REITs trading volume together with its previous returns and previous market returns can all provide better estimation for current trading volume. The same applies on models (4) and (5).

Granger causality test, developed by Granger (1969), is carried out to support the findings of VAR test. It determines the direction of relationship between the variables understudy, through defining whether any of the three variables cause the other. The paper employs a number of diagnostic tests to assure that error terms are free from heteroscedasticity and serial correlation. Breusch-Pagan test is applied to check for the presence of heteroscedasticity and Breusch-Godfrey test to check for serial correlation.

The relationship between REITs trading volume, REITs returns and stock market returns is investigated before and after COVID-19 crisis. This is done by splitting the whole sample into two subsamples based on the confirmation of the first coronavirus case in Saudi Arabia as of 2nd of March, 2020. The first subsample starts as of 13th of November, 2016 till the end of February, 2020. The second subsample starts as of 1st of March, 2020 till 13th of June, 2022.

RESULTS

The results of ADF test and PP test in tables (1) and (2) show that REITs trading volume, REITs returns and stock market returns are all stationary. The absolute test statistical value in both tests, for all the three variables, is higher than the critical values at 1%, 5% and 10% level, respectively.

Augmented Dickey-Fuller unit root test to measure the stationarity of REITs trading volume (V), REITs returns (R) and stock market returns (RM).

Variable	t-statistic	Probability*	Test Critical Value		
			1%	5%	10%
V	-10.341	0.000***	-3.960	-3.410	-3.120
R	-38.652	0.000***	-3.960	-3.410	-3.120
RM	-30.166	0.000***	-3.960	-3.410	-3.120

Table 1. ADF test

Note: *, **, *** denotes significance at 10%, 5% and 1% level, respectively

Phillips-Perron unit root test to measure the stationarity of REITs trading volume (V), REITs returns (R) and stock market returns (RM).

Variable	t-statistic	Probability*	Test Critical Value		
			1%	5%	10%
V	-163.888	0.000***	-29.500	-21.800	-18.300
R	-1064.967	0.000***	-29.500	-21.800	-18.300
RM	-1114.968	0.000***	-29.500	-21.800	-18.300

Table 2. PP test

Note: *, **, *** denotes significance at 10%, 5% and 1% level, respectively.

To apply the VAR model**,** the maximum number of lags should be determined. The results in table (3) show that AIC gives the lowest significant value, therefore, the optimal number of lags is four.

AIC, HQIC and SBIC criteria to define the maximum number of lags for REITs trading volume (V), REITs returns (R) and stock market returns (RM).

Lag	LL	LR	df	P	FPE	AIC	HQIC	SBIC
0	1538.70				2.2e-09	-11.4178	-11.4017	-11.3778
1	1736.78	396.16	9	0.000	5.4e-10	-12.8236	-12.7592	-12.663*
2	1756.38	39.203	9	0.000	5.0e-10	-12.9025	-12.789*	-12.6218
3	1766.39	20.013	9	0.018	5.0e-10	-12.9100	-12.7490	-12.5091
4	1778.64	24.497*	9	0.004	4.8e-10*	-12.934*	-12.7248	-12.4129

Table 3. Selection-order Criteria

Table (4) presents the results of VAR test. There is no significant impact running from market returns into REITs trading volume. While lag (1) and lag (2) of REITs returns affect positively and significantly at 1% level and 5% level, respectively, on current trading volume. The results provide support for the Return Chasing Hypothesis (RCH). REITs investors in the Saudi stock market consider previous REITs returns when taking their investment decisions. These findings are in support with the findings of Babalos, Caporale, and Spagnolo (2019) and Zhu and Woltering (2021). Previous trading volume affects positively and significantly on current trading volume. Investors tend to consider previous number of shares traded in the market when taking their investment decisions. Current REITs returns and market returns are not affected by previous trading volume. The findings don't provide support for the Information Hypothesis (IH). Investors in the Saudi stock market are uninformed and don't possess useful private information that drive their investment decisions. The findings are not aligned with the findings of Jank (2012) and Latief and Shah (2014).

The findings on the relationship between REITs returns, market returns and their previous values reveal mix results. Only the first lag of market returns affects positively and significantly on REITs returns, at 1% level. Whereas, the impact of REITs returns on market returns is not significant. The second lag and third lag of REITs returns have positive and negative effect, respectively, on current REITs returns. The first and fourth lags has no impact on current REITs returns. For the impact of previous market returns on the current, only the first and fourth lags have positive and significant effect at 1% and 10% level, respectively. The different information arriving to the market could be misleading to investors and can affect their investment decisions. This might be the reason behind the mix results (Jennings, Starks, and Fellingham 1981).

Vector Autoregression model (VAR) to define the direction of relationship between REITs trading volume (V), REITs returns (R) and stock market returns (RM).

	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
V						
VL1.	0.5029	0.0537	9.35	0.000***	0.3975	0.6083
VL2.	0.1289	0.067	1.92	0.055*	-0.0025	0.2604
VL3.	0.042	0.0677	0.62	0.535	-0.0907	0.1748
VL4.	0.2407	0.0601	4	0.000***	0.1228	0.3587
RL1.	7.2951	1.4155	5.15	0.000***	4.5207	10.069
RL2.	2.4835	1.2365	2.01	0.045**	0.0598	4.9071
RL3.	1.4942	1.154	1.29	0.195	-0.7675	3.7561
RL4.	-1.3934	1.1221	-1.24	0.214	-3.5927	0.8058
RML1.	-0.265	1.3715	-0.19	0.847	-2.9532	2.4231
RML2.	-2.1318	1.4393	-1.48	0.139	-4.9528	0.6892
RML3.	-1.844	1.4548	-1.27	0.205	-4.6956	1.0074
RML4.	1.2957	1.2943	1	0.317	-1.241	3.8325
_cons	0.5481	0.2171	2.52	0.012	0.1224	0.9737
R						
VL1.	-0.0029	0.0023	-1.21	0.225	-0.0076	0.0017
VL2.	0.0029	0.0029	0.99	0.324	-0.0029	0.0088
VL3.	0.0016	0.003	0.54	0.59	-0.0042	0.0075
VL4.	-0.0007	0.0026	-0.28	0.781	-0.006	0.0045
RL1.	0.0567	0.063	0.9	0.369	-0.0669	0.1803
RL2.	0.1751	0.055	3.18	0.001***	0.0671	0.2831
RL3.	-0.122	0.0514	-2.37	0.018**	-0.2228	-0.0212
RL4.	0.0147	0.05	0.3	0.767	-0.0832	0.1127
RML1.	0.3031	0.0611	4.96	0.000***	0.1833	0.4228
RML2.	-0.0697	0.0641	-1.09	0.277	-0.1954	0.0559

RML3.	-0.0375	0.0648	-0.58	0.562	-0.1646	0.0894
RML4.	0.0116	0.0576	0.2	0.84	-0.1013	0.1246
_cons	-0.0062	0.0096	-0.65	0.519	-0.0252	0.0127
RM						
VL1.	-0.0046	0.0033	-1.37	0.17	-0.0111	0.0019
VL2.	0.0054	0.0041	1.29	0.196	-0.0027	0.0136
VL3.	-0.0016	0.0042	-0.4	0.69	-0.0099	0.0066
VL4.	-0.0011	0.0037	-0.32	0.75	-0.0085	0.0061
RL1.	0.0224	0.0884	0.25	0.799	-0.1508	0.1958
RL2.	0.0623	0.0775	0.81	0.42	-0.089	0.2137
RL3.	0.0118	0.072	0.16	0.87	-0.1294	0.1531
RL4.	-0.0614	0.0701	-0.88	0.381	-0.1988	0.0759
RML1.	0.2547	0.0856	2.97	0.003***	0.0867	0.4226
RML2.	0.0432	0.0899	0.48	0.631	-0.133	0.2194
RML3.	-0.0697	0.0908	-0.77	0.443	-0.2478	0.1084
RML4.	0.1425	0.0808	1.76	0.078*	-0.0158	0.301
_cons	0.0125	0.0135	0.93	0.354	-0.014	0.0391

Table 4. VAR Test

Note: *, **, *** denotes significance at 10%, 5% and 1% level, respectively.

The results of Granger causality-Wald test in Table (5) confirm that REITs returns ganger cause REITs trading volume, which is consistent with the findings of Lobão and Levi (2016) and Gong (2019). On the other hand, REITs volume neither ganger cause REITs returns nor market returns.

Granger causality test to define the direction of the relationship between REITs trading volume (V), REITs returns (R) and stock market returns (RM).

Equation	Excluded	chi2	Df	Prob > chi2
V	R	28.533	4	0.000*
V	RM	4.6821	4	0.321
R	V	2.8025	4	0.591
R	RM	24.831	4	0.000*
RM	V	3.6311	4	0.458
RM	R	1.9124	4	0.752

Table 5. Granger Causality Wald Test

Note: *, **, *** denotes significance at 10%, 5% and 1% level, respectively.

The findings of Granger causality test are aligned with the results of VAR test. Both tests provide support for the RCH, which is consistent with the findings of Baquero and Verbeek (2015) and Babalos, Caporale, and Spagnolo (2019). Around 82% of the investors in the Saudi stock market are national investors as of 2021 (www.saudiexchange.sa). Individual Saudi investors compromise around 40% of total market investors. The different information the individual investors are exposed to and their lack of knowledge regarding how to invest in the market might drive them to chase returns, which provide support for the RCH.

There is no heteroskedasticity problem according to the results of Breusch-Pagan test in Table (6). There is no predictability in the error variance since the p-value is above 5%. The p-value of the Breusch-Godfrey test in table (7) is above 5%, therefore, the presence of serial correlation between the error terms is rolled out.

Chi2	Df	Prob > Chi2
0.70	4	0.4035

Table 6. Breusch-Pagan-Godfrey Heteroskedasticity Test

Chi2	Df	Prob > Chi2
2.464	4	0.1164

Table 7. Breusch-Godfrey Serial Correlation LM Test

Analyzing the impact of COVID-19 crisis on the relationship between REITs trading volume, its returns and stock market returns show comparable results, in tables (8) and (9), for both sub-samples. In the pre-COVID-19 period, neither previous REITs returns nor market returns affect current trading volume. The findings don't support the RCH. The first and fourth lags of REITs trading volume affect significantly, at 1% level, on current REITs returns. The impact of the first lag is positive, whereas the impact of the fourth lag is negative. On the contrary, previous REITs volume don't cause market returns.

For the post-COVID-19 period, unlike the whole sample and the pre-COVID-19 sample, the maximum number of lags is three based on AIC. The current REITs trading volume is only affected negatively, at 10% level, by the second lag of market returns. The first two lags of REITs volume have positive and negative significant impact, respectively, on REITs returns at 1% level. Previous REITs volume don't cause current market returns.

The significant impact of REITs volume on REITs returns in both sub-periods is not consistent. Therefore, it doesn't provide strong support for the IH, and it's not in accordance with the findings of Jank (2012) and Latief and Shah (2014). Rather, it might result from the variety of information the investors are exposed to in the Saudi stock market. Besides that, both sub-periods don't provide support for the RCH. More informed investors, institutional, are investing in the Saudi stock market after the crisis. The percentage of institutional investors increased from 36% as of 2019 to around 45% as of 2020 and 2021 (www.saudiexchange.sa). Their high informativeness reduces the return chasing behavior in the market. During the COVID-19 crisis, Tadawul All Share Index (TASI) accelerated reaching 11,200 points as of 2021 from 8400 points as of 2019. Major developments took place during this post-crisis period to attract more qualified investors to the market. TASI completed the process of joining leading indexes, such MSCI and FTSE. As of August, 2020, the Saudi Stock Exchange (TADAWUL) launched the first exchange-traded derivatives market and clearing house to provide protection for investors against market's downside risk (www.saudiexchange.sa). The acceleration of number of institutional investors reduces the return chasing behavior in the market due to higher investor's informativeness, but their informational and stabilizing rule is still not achieved. They might be short-term investors who seek profit, rather than long-term investors. This is supported by the findings of Alhussayen (2022) which reveal that foreign institutional investors pursue large size Saudi companies with high liquidity. They neither consider the leverage position of the companies they invest in nor the macroeconomic conditions of the Saudi market.

CONCLUSION

This research investigates the relationship between REITs trading volume, REITs returns and stock market returns. It covers REITs data and Saudi stock market data from the end of 2016 till mid of 2022. In accordance with the findings of Baquero and Verbeek (2015) and Babalos Caporale, and Spagnolo (2019) the results of VAR test, for the whole sample, provide support for the RCH. REITs investors in the Saudi stock market tend to chase REITs previous returns when taking their investment decisions. Splitting the whole sample into pre and post COVID-19 periods don't provide support for the RCH and IH. Although the major developments occur in the Saudi stock exchange (TADAWUL) during the post COVID-19 period reduce the return chasing behavior and make it more attractive for institutional investors, still their informational and stabilizing role in the market is not accomplished.

For investors and market regulators in the Saudi stock market, important implications can be driven from this paper. They should realize how REITs trading volume, REITs returns and stock market returns affect one another. They should also comprehend how the developments, the Saudi stock market is going through, can affect the causality of REITs volume and returns. Understanding the relationship between REITs trading volume and returns is required for investors in the Saudi stock market to, be able to, take better investment decisions. Market regulators will also be able to promote market efficiency and advancement through making better enhancements on the regularity framework.

The paper can be extended through analyzing more deeply the relationship between REITs returns and stock market returns. Also, considering the impact of other factors, such as economic factors, on the relationship understudy can enrich the literature. Due to the acceleration of percentage of institutional investors in the Saudi stock market, it would be beneficial to analyze their investment behavior in REITs.

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APPENDIX

Vector Autoregression model (VAR) to define the direction of relationship between REITs trading volume (V), REITs returns (R) and stock market returns (RM) for the Pre COVID-19 Period.

	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
V						
VL1.	0.5575	0.0700	7.96	0.000***	0.4202	0.6948
VL2.	0.2195	0.0911	2.41	0.016**	0.0409	0.3981
VL3.	-0.0691	0.0913	-0.76	0.449	-0.2481	0.1099
VL4.	0.2222	0.0776	2.86	0.004***	0.0700	0.3744
RL1.	1.5656	1.5346	1.02	0.308	-1.4422	4.5735
RL2.	2.0205	1.5042	1.34	0.179	-0.9276	4.9688
RL3.	1.1738	1.4421	0.81	0.416	-1.6527	4.0004
RL4.	2.9556	1.8269	1.62	0.106	-0.6251	6.5363
RML1.	0.0396	1.9697	0.02	0.984	-3.8209	3.9002
RML2.	-0.2705	2.4900	-0.11	0.913	-5.1509	4.6098
RML3.	2.0740	1.9950	1.04	0.299	-1.8360	5.9841
RML4.	-1.3788	1.9067	-0.72	0.470	-5.1159	2.3583
_cons	0.4468	0.3289	1.36	0.174	-0.1978	1.0915
R						
VL1.	0.0102	0.0029	3.50	0.000***	0.0044	0.0159
VL2.	0.0000	0.0038	0.02	0.986	-0.0073	0.0075
VL3.	-0.0001	0.0038	-0.04	0.964	-0.0076	0.0072
VL4.	-0.0094	0.0032	-2.93	0.003***	-0.0158	-0.0031
RL1.	-0.1414	0.0640	-2.21	0.027**	-0.2669	-0.0160
RL2.	-0.1021	0.0627	-1.63	0.103	-0.2251	0.0208
RL3.	0.3334	0.0601	5.54	0.000***	0.2155	0.4513
RL4.	0.2192	0.0762	2.88	0.004***	0.0698	0.3686
RML1.	0.1424	0.0821	1.73	0.083*	-0.0185	0.3035
RML2.	0.0037	0.1038	0.04	0.971	-0.1998	0.2073
RML3.	-0.0058	0.0832	-0.07	0.944	-0.1689	0.1572
RML4.	-0.1742	0.0795	-2.19	0.028**	-0.3301	-0.0183
_cons	-0.0031	0.0137	-0.23	0.817	-0.0300	0.0237
RM						
VL1.	0.0007	0.0026	0.29	0.771	-0.0044	0.0059
VL2.	0.0019	0.0034	0.56	0.574	-0.0048	0.0086
VL3.	-0.0019	0.0034	-0.57	0.567	-0.0087	0.0047
VL4.	-0.0018	0.0029	-0.65	0.518	-0.0076	0.0038
RL1.	-0.0065	0.0580	-0.11	0.910	-0.1203	0.1072
RL2.	-0.0120	0.0568	-0.21	0.833	-0.1235	0.0995
RL3.	0.0209	0.0545	0.38	0.701	-0.0859	0.1278
RL4.	0.0639	0.0691	0.93	0.355	-0.0714	0.1993
RML1.	0.1826	0.0745	2.45	0.014**	0.0365	0.3286
RML2.	-0.0822	0.0941	-0.87	0.382	-0.2668	0.1022
RML3.	-0.0388	0.0754	-0.51	0.607	-0.1866	0.1090
RML4.	-0.1408	0.0721	-1.95	0.051*	-0.2821	0.0005
_cons	0.0086	0.0124	0.69	0.489	-0.0157	0.0329

Table 8. VAR Test for Pre COVID-19 Period

Note: *, **, *** denotes significance at 10%, 5% and 1% level, respectively.

Vector Autoregression model (VAR) to define the direction of relationship between REITs trading volume (V), REITs returns (R) and stock market returns (RM) for the Post COVID-19 Period.

	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
V						
VL1.	0.6758	0.0634	10.65	0.000***	0.5515	0.8002
VL2.	-0.1130	0.0791	-1.43	0.153	-0.2681	0.0420
VL3.	0.3069	0.0700	4.38	0.000***	0.1696	0.4442
RL1.	2.0804	1.9471	1.07	0.285	-1.7358	5.8967
RL2.	1.7485	1.8402	0.95	0.342	-1.8583	5.3553
RL3.	-0.0945	1.4520	-0.07	0.948	-2.9404	2.7513
RML1.	-0.2182	1.4281	-0.15	0.879	-3.0172	2.5808
RML2.	-2.5031	1.4475	-1.73	0.084*	-5.3402	0.3340
RML3.	0.0958	1.3433	0.07	0.943	-2.5371	2.7287
_cons	0.8900	0.2932	3.04	0.002	0.3153	1.4646
R						
VL1.	0.0130	0.0021	5.97	0.000***	0.0087	0.0172
VL2.	-0.0074	0.0027	-2.72	0.007***	-0.0127	-0.0020
VL3.	-0.0031	0.0024	-1.32	0.187	-0.0078	0.0015
RL1.	0.1870	0.0669	2.80	0.005***	0.0559	0.3182
RL2.	0.0875	0.0632	1.38	0.166	-0.0364	0.2115
RL3.	0.0409	0.0499	0.82	0.412	-0.0568	0.1388
RML1.	0.2889	0.0490	5.89	0.000***	0.1927	0.3851
RML2.	-0.1653	0.0497	-3.32	0.001***	-0.2628	-0.0677
RML3.	-0.1130	0.0461	-2.45	0.014**	-0.2035	-0.0225
_cons	-0.0155	0.0100	-1.54	0.124	-0.0352	0.0042
RM						
VL1.	-0.0008	0.0030	-0.29	0.769	-0.0068	0.0050
VL2.	0.0034	0.0037	0.92	0.360	-0.0039	0.0109
VL3.	-0.0034	0.0033	-1.04	0.298	-0.0100	0.0030
RL1.	-0.0232	0.0934	-0.25	0.803	-0.2063	0.1598
RL2.	-0.0798	0.0882	-0.90	0.366	-0.2528	0.0932
RL3.	0.0433	0.0696	0.62	0.534	-0.0932	0.1798
RML1.	0.1244	0.0685	1.82	0.069*	-0.0098	0.2587
RML2.	0.1407	0.0694	2.03	0.043**	0.0046	0.2768
RML3.	0.1680	0.0644	2.61	0.009***	0.0417	0.2943
_cons	0.0064	0.0140	0.46	0.646	-0.0211	0.0340

Table 9. VAR Test for Post COVID-19 Period

Note: *, **, *** denotes significance at 10%, 5% and 1% level, respectively.

ACKNOWLEDGEMENT