





## INVESTIGATING THE INFLUENCE OF FINANCIAL INDICATORS ON STOCK RETURNS IN THE PRESENCE OF THE COVID-19 PANDEMIC




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### ABSTRACT

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In this paper, we investigate the influence of financial proxies on companies in the real estate sector listed on the Amman stock exchange during the Covid-19 pandemic. A panel data method is employed for the sample, which includes 29 listed real estate companies, for the period from 2010 to 2020. The financial proxies are considered as independent variables, which consist of earnings per share, book value per share, price-to-earnings (P/E) ratio, price-to-book value, debt ratio, and current ratio, while the market return is the dependent variable. The results revealed that all financial proxies have a significant impact on market returns. Furthermore, the financial proxies are positively and significantly correlated with market returns. The results also showed that the Covid-19 pandemic negatively affected the real estate sector returns. Decision makers in real estate companies are required to manage their working capital in an effective and efficient manner in order to deal with unforeseen short-term events as investors might use historical financial data to estimate companies' returns.

**Contribution/Originality:** This paper contributes to the following points. Firstly, it extends the literature in evaluating the market returns based on financial indicators in the Amman stock exchange. Secondly, this study differs from other in terms of the sample selection. While other studies focused on the industrial and banking sectors in Jordan, this study considers the real estate sector. Finally, to the best of the authors' knowledge, no study has been conducted on the influence of the Covid-19 pandemic on real estate index returns in the Amman stock exchange.

## 1. INTRODUCTION

Economics and equity markets have been affected by several financial crises, namely the Great Crash of 1929, the Black Monday Crash of October 1987, the global financial crisis of 2008, and the recent Covid-19 pandemic, which affect equity markets and make them more volatile (Almansour, 2015b; Almansour, Alshater, & Almansour, 2021). In a related study, Noor and Sharabati (2014) studied the influence of the global financial crisis on the Amman Stock Exchange, and their findings showed that the Jordanian equity market was significantly affected.

History has shown that financial proxies are considered as major elements in terms of predicting companies' financial performance, especially stock price development, which leads decision-makers to create several forward-thinking strategies regarding investment and financial decisions to achieve optimal financial performance (Altman, 1968). Therefore, critical financial decisions should be made carefully, as they dictate the level of success or failure of firms' activities (Nadyayani & Suarjaya, 2021).

Corporate finance theory states that financial performance is generally associated with how efficiently companies use their assets as efficient operation should lead to generating profits and maximizing shareholders' wealth (Yin & Nie, 2021). Another financial theory is the pecking order theory, which considers the problems between management and outside investors as a result of asymmetric information. According to asymmetric information hypotheses, the management in businesses should have more information about their business than their investors. In other words, management and employees should have more knowledge about the business than outsiders. Therefore, the management, who are decision makers regarding business actions, serve as signalers to investors regarding firm performance (Myers, 1984; Talberg, Winge, Frydenberg, & Westgaard, 2008). According to this hypothesis, projects are financed first through internally generated financial resources, then through safe debt issue, risky debt issuance, and finally new equity issuance due to the information asymmetry that occurs between markets and corporate managers (Myers, 1984). Companies with a high leverage ratio are more likely to lose money since the larger the liability, the riskier the company. A large degree of debt might hinder a company's capacity to streamline current cash for operational funding, or it can become a burden if the loan is not paid off (Slamet and Munandar (2022). This causes investors to question the stability and operational efficiency of a company if they discover that it has a large debt level, which can negatively impact the value of the enterprise.

Researchers have studied the development of financial models over the past few decades. However, financial ratios are shown to have power in terms of forecasting financial performance, and financial ratios are also helpful analysis tools for financial planning (Almansour, 2015a; Dai & Zhu, 2020; Zulfiqar, Haddad, Al-Shehhi, & Mate, 2016). Specifically, investigating financial performance for the success of a business, and examining the association between financial proxies and market returns, are essential for estimating or predicting the growth of a firm's value and evaluating the financial market. From an investor's perspective, a firm's value will be assessed based on the market price; this will enable decision makers to fully consider whether the operational performance and the financial performance need to be improved. Financial indicators should be identified since they indicate the probability of distress and forecast financial difficulties, especially when dealing with the real estate sector (Liang, Tsai, Lu, & Chang, 2020; Sun, Li, Fujita, Fu, & Ai, 2020).

The real estate sector has played an important role for expatriate investors who are looking for ways to increase their income while reducing their risks and who are looking for a stable investment environment with good infrastructure and a suitable climate and geography for leisure and convenience. Jordan's Land and Survey Department declared that Jordan is classified as an emerging economy, and the real estate sector was observed to be growing gradually; the total trade volume was 5.6 billion Jordanian dinar (JD), up from JD 5.2 billion in 2006. However, the real estate trading volume decreased by 33% in 2020 compared to 2019. Figure 1 illustrates the real estate price index.

According to the Jordan News Agency (Petra), the performance of real estate firms declined by 48% in 2020 due to the Covid-19 pandemic. Therefore, this study attempts to investigate the influence of financial indicators on real estate market returns by employing comprehensive financial proxies, namely book value per share, earnings per share, price-to-earnings ratio (times), price-to-book value (times), debt ratio, and current ratio (Abe & Nakayama, 2018; Akhtar, 2021; Banerjee, 2019; Cengiz, 2020; Kiruba & Vasantha, 2020; Musallam, 2018; Ozyeşil, 2020).

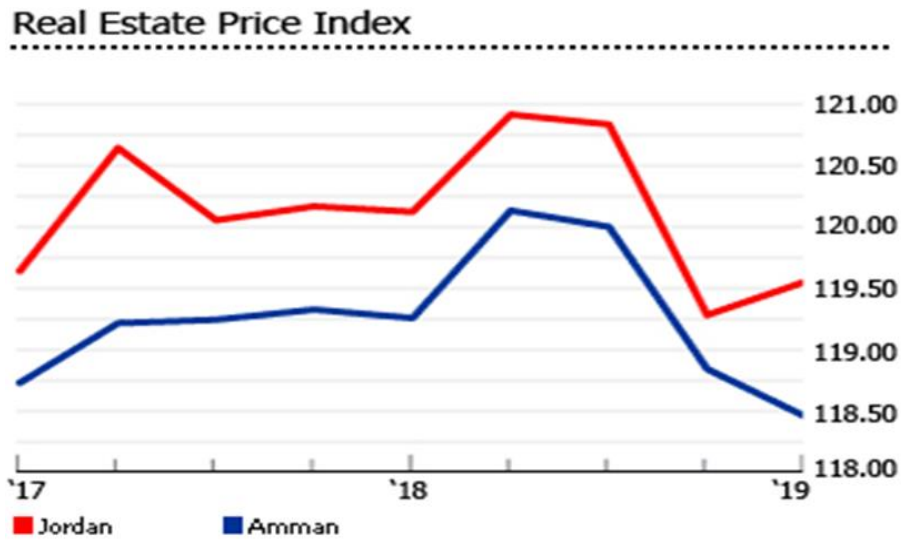


Figure 1. The real estate price index in Jordan.

Source: Central Bank of Jordan, Global Property Guide.

Furthermore, this study contributes theoretically by testing the pecking order theory by answering the following questions: (1) Were real estate indicators' returns significantly affected by the earnings per share ratio? (2) Were real estate indicators' returns significantly affected by the book value per share ratio? (3) Were real estate indicators' returns significantly affected by the price-to-earnings ratio? (4) Were real estate indicators' returns significantly affected by the price-to-book value? (5) Were real estate indicators' returns significantly affected by the debt ratio? (6) Were real estate indicators' returns significantly affected by the current ratio? (7) Were real estate indicators' returns significantly affected by the Covid-19 pandemic?

## 2. LITERATURE REVIEW

The association between financial indicators and market returns has been studied by researchers in developed and developing countries (Akhtar, 2021; Arkan, 2016; Banerjee, 2019; Cengiz, 2020; Kiruba & Vasantha, 2020; Musallam, 2018; Ozyeşil, 2020). Several financial ratios have been considered in evaluating financial performance and, therefore, stock returns. Consequently, the association between financial ratios and stock returns is important (Cengiz, 2020; Kiruba & Vasantha, 2020). The main objectives of financial ratios are to summarize and analyze the financial statements to help predict the market returns. The linkage between financial ratios and market returns has been argued in various studies (Almansour, 2015a; Arkan, 2016). Listed real estate is seen as a mix of stock and real estate because stock prices should, in the long term, reflect the underlying real estate asset values (Lin, 2013). If this is the case, market integration between the public and private real estate markets may be greater. In this setting, over a long period of time, real estate stocks are likely to produce a return that is similar to the return on the underlying real estate assets. Financial ratio instruments, according to Almansour (2015a), can be used as indicators to provide investors with beneficial information, such as liquidity, leverage, profitability, activity, and market ratios.

Zaheri and Barkhordary (2015) examined the effect of financial proxies on Tehran market returns from 2004 to 2011. They employed a panel data analysis using several financial indicators. They revealed that the market stock return is significantly affected by the book-to-market equity ratio, return on equity, and the return on assets ratio, whereas the market return is not significantly affected by the net profit margin ratio. In another related study, Hoang, Nguyen, and Nguyen (2022) investigated the association between financial indicators and market returns for listed startups across four countries. They found that the market return is positively connected with the total debt-to-earnings ratio before interest and taxes, meaning that if the market return increases, the total debt-to-earnings ratio before interest and taxes will also increase and vice versa.

In the Indonesian financial market, [Wijaya \(2015\)](#) studied the influence of financial indicators on Indonesian market returns from 2008 to 2013 for 20 listed manufacturing companies. The results concluded that there is a significant influence of book-to-market ratio, dividend yield, return on assets, and earnings yield on Indonesian market stock returns. Furthermore, the findings provide evidence that the market returns in Indonesia are insignificantly affected by the debt-to-equity ratio.

In the Prague Stock Exchange and the Warsaw Stock Exchange, [Pražák and Stavárek \(2017\)](#) investigated the effect of financial indicators on the stock price development for industrial companies from 2006 to 2015. Several financial ratios were employed, namely financial leverage ratio, return on investment ratio, debt-to-equity ratio, return on equity ratio, and liquidity ratio. They applied the generalized method of moments (GMM) analysis, and the results showed that financial leverage significantly and positively affected the stock prices, whereas the liquidity ratio negatively influenced the stock prices in both stock market exchanges.

[Musallam \(2018\)](#) studied the linkage between financial proxies and market returns in the Qatar Stock Exchange for 26 listed companies over the period from 2009 to 2015. He revealed that the dividend yield ratio, earnings per share, and earnings yield ratio have a significant linkage with market returns. However, the price-to-earnings ratio was found to have an insignificant association with market returns.

In the Jordanian context, [Awwad and Salem \(2019\)](#) evaluated the prices of industrial stocks listed on the Amman Stock Exchange by employing financial ratios from 2010 to 2017. The regression method was applied to investigate the association between financial indicators and market returns. The results indicate that there are significant relationships between the price-to-book value ratio, total assets turnover, quick ratio, return on equity, debt ratio, profit per share, the ratio of circulation, and price-to-earnings ratio with the market return. In contrast, the market return was not found to be significantly affected by working capital turnover or the degree of financial leverage.

[Alswalmeh and Dali \(2019\)](#) studied the role of seven financial ratios in predicting banking sector index returns in the Amman stock exchange from 2005 to 2017. The results of the ordinary least square method declared that banking sector index returns are significantly correlated with return on assets, return on equity, debt ratio, price to book value, and stock turnover. Meaning that the above-mentioned financial indicators have the ability to forecast banking index returns in Amman Stock Exchange. In contrast, the equity ratio and quick ratio are found to be unable to predict banking index returns in the Amman stock exchange. Recently, [Alswalmeh and Qaqish \(2021\)](#) test several financial ratios in predicting also Amman Stock Exchange index returns by considering the banking sector only from 2000 to 2014. The findings of the ordinary least square method show that the market returns are significantly associated with debt ratio, return on assets ratio, liquidity ratio, stock turnover ratio, and market to book ratio whereas the market returns were negatively related to return on equity ratio.

[Metsomäki \(2020\)](#) explores the association between financial indicators and stock returns in the Finnish market over the period from 2014 to 2018. The results show that the market value ratio and profitability ratio have strong association with stock returns in the Finnish stock market. A recent paper conducted by [Ichsan, Suparmin, Yusuf, Ismal, and Sitompul \(2021\)](#) study the financial ratios during the current pandemic of Covid-19 for the Islamic banking sector's performance over the period 2011 to 2020. The results reveal that the loan-to-deposit ratio, capital adequacy ratio, and operating costs to operating income have a significant and positive effect on financial performance measured by return on assets. Based on the abovementioned studies, the following hypotheses have been developed:

*H1: Real estate indicators' returns are significantly affected by the earnings per share ratio.*

*H2: Real estate indicators' returns are significantly affected by the book value per share ratio.*

*H3: Real estate indicators' returns are significantly affected by the price-to-earnings ratio.*

*H4: Real estate indicators' returns are significantly affected by the price-to-book value.*

*H5: Real estate indicators' returns are significantly affected by the debt ratio.*

H6: Real estate indicators' returns are significantly affected by the current ratio.

H7: Real estate indicators' returns are significantly affected by the Covid-19 pandemic.

### 3. RESEARCH METHODOLOGY

#### 3.1. Data Sources

This study uses the panel data approach, which consists of yearly financial ratios for public real estate companies listed on the Amman Stock Exchange. The data were obtained from the Amman stock exchange website (<https://www.ase.com.jo/en>). The sample in this study consists of 29 real estate companies whose data were collected using disclosed financial statements on the Amman Stock Exchange over the period from 2010 to 2020. The real estate stock returns were obtained from the Amman Stock Exchange website over the 2010 to 2020 period.

#### 3.2. Research Design and Measurement of Variables

We investigate the influence of financial indicators on real estate market returns. The measurements of the variables are presented in Table 1.

Table 1. Measurements of variables.

N	Variables	Ticker	Measurement
1	Real Estate Index Returns	REIR	$\log(\text{price}_t) - \log(\text{price}_{t-1})$
2	Earnings Per Share	EPS	Net income / # outstanding shares
3	Book Value Per Share	BVPS	Equity available to common shareholders / # outstanding shares
4	Price/Earnings Ratio (Times)	PER	Share price / EPS
5	Price-to-Book Value (Times)	PBV	Market price / book value
6	Debt Ratio	DR	Total debt / total assets
7	Current Ratio	CR	Current assets / current liabilities
8	COVID-19	Dummy	0 = before Covid-19; 1 = after Covid-19

#### 3.3. Panel Data Analysis Approach

There are three major models in panel data analysis that can be distinguished through the absence or the presence of unobserved effects or individual effects. The pooled standard ordinary least squares (OLS) regression model is employed when individual effects are not present, where the presence of individual effects will highlight the use of one particular model. Moreover, the association of the individual effects with other regressors in the model will lead to the selection of the appropriate estimated regression model, either the fixed effects (FE) model or the random effects (RE) model, as an association will promote the use of the FE model, and no association will promote the use of the RE model. Three statistical tests are used to elect the most suitable model for the study: First is the F-test, which is employed to compare between pooled and FE models; second is the Breusch-Pagan Lagrange Multiplier (LM) test, which is employed to compare between pooled and RE models; and third is the Hausman specification test, which is used to compare between the FE and RE models. The estimated regression model is shown as follow:

$$\text{REIR}_i = \beta_1 \text{EPS}_i + \beta_2 \text{BVPS}_i + \beta_3 \text{PER}_i + \beta_4 \text{PBV}_i + \beta_5 \text{DR}_i + \beta_6 \text{CR}_i + \beta_7 \text{COVID-19}_i + \varepsilon_i$$

Where:

REIR:	Real Estate Index Returns.
EPS:	Earnings Per Share.
BVPS:	Book Value Per Share.
PER:	Price-to-Earnings Ratio (Times).
PBV:	Price-to-Book Value (Times).
DR:	Debt Ratio.
CR:	Current Ratio.
COVID- 19:	Coronavirus Pandemic.

#### 4. EMPIRICAL RESULTS

This section starts with illustrating the descriptive statistics, diagnostic tests, and regression results.

**Table 2.** Descriptive analysis on company performance.

Variables	Obs.	Mean	Std. Dev.	Min.	Max.
REIR	319	-0.040	0.064	-0.011	0.072
CR	319	5.876	12.853	0.61	134.91
DR	319	0.207	0.205	0.28	0.901
PBV	319	1.002	2.539	0.17	44.46
PER	319	5.835	6.58	-26.18	18.82
BVPS	319	1.036	0.445	0.93	2.49
EPS	319	-0.0945	0.122	-0.66	0.9

##### 4.1. Descriptive Analysis

The results for the descriptive statistics are presented in Table 2.

There are 319 observations for all seven variables. The average value for real estate stock returns scores a value of -0.04 with a standard deviation of 0.064. The current ratio records an average value of 5.87 with a standard deviation of 12.85, meaning that the real estate companies were able to meet their obligations. The debt ratio recorded high mean and standard deviation values of 20.7% and 20.5%, respectively; this means that the real estate companies have more liabilities than assets, which put the companies at risk of default on their loans if interest rates were to rise suddenly. The price-to-book value records mean and standard deviation values of 1.002 and 2.53, respectively; this means that the stock price of real estate companies listed on the Amman stock exchange is trading in line with the book value. The price-to-earnings ratio records an average value of 5.83, meaning that the shares of real estate companies are overvalued in the market and investors are forecasting high growth rates in the future. The book value per share ratio records mean and standard deviation values of 1.03 and 0.44, respectively, meaning that the value of equity in real estate companies after paying all liabilities has an average of 1.03. The earnings per share ratio records mean and standard deviation values of -0.09 and 0.12, respectively, meaning that the real estate companies have, on average, a negative accounting profit of -0.09.

##### 4.2. Diagnostic Tests

Before employing a regression analysis, the assumptions must be tested. Table 3 shows the results of the correlation matrix between the variables as well as the variance inflation factor (VIF) results.

**Table 3.** Correlation matrix and VIF results.

Variables	REIR	CR	DR	PBV	PER	BVPS	EPS	VIF
REIR	1							1.010
CR	0.059	1						1.040
DR	0.026	-0.166	1					1.120
PBV	0.056	-0.046	0.211	1				1.100
PER	0.053	-0.005	-0.019	0.068	1			1.010
BVPS	0.035	0.116	-0.193	-0.159	-0.027	1		1.180
EPS	0.047	0.029	-0.202	-0.241	-0.014	0.358	1	1.220

The results of the correlation analysis and VIF test are shown in Table 3. It can be observed that the highest VIF value is 1.22 for the earnings per share ratio, and the lowest value is 1.01 for both market returns and price-to-earnings ratio, meaning that there is no detection of multicollinearity issues since all values are less than 10 (Almansour, 2015a). The assumption of heteroskedasticity is tested by employing the Breusch-Pagan/Cook-Weisberg tests. The results showed that the probability value of  $\chi^2$  is 0.095, which is greater than 0.05, meaning that there is no heteroskedasticity problem. The Wooldridge test is employed for the autocorrelation test, and the



probability value is greater than 0.05 with a recorded value of 0.0875, meaning that there is no autocorrelation problem. These results lead to employing the regression analysis of pooled, fixed, and random effects.

#### 4.3. The Impact of Financial Ratios on Real Estate Market Returns

The results for the impact of financial indicators on real estate market returns are presented in Table 4. The pooled effects regression model is appropriate for this research as suggested by the adopted F-test and the Breusch–Pagan Lagrange test. Based on the regression model, the analysis of the explanatory power of the research model was found to be statistically insignificant. The probability records a value of 0.132, which is greater than 0.05 and suggests that the pooled regression model is the best fit for this study.

Table 4. The impact of financial ratios on real estate market returns.

Variables	Pooled Effects		Fixed Effects		Random Effects	
	Coeff.	P-Value	Coeff.	P-Value	Coeff.	P-Value
CR	0.061	0.049	0.053	0.012	0.039	0.001
DR	0.088	0.006	0.021	0.006	0.075	0.006
PBV	0.014	0.002	0.078	0.002	0.019	0.003
PER	0.018	0.000	0.027	0.003	0.002	0.005
BVPS	0.048	0.000	0.045	0.045	0.009	0.007
EPS	0.033	0.042	0.078	0.006	0.062	0.041
Covid-19	-0.083	0.000	-0.011	0.000	-0.086	0.000
Cons.	-0.029	0.006	0.007	0.008	-0.029	0.006
Hausman test						0.539
Breusch–Pagan Lagrange test						0.672
F-test						0.132

The regression result showed that all financial indicators have a significant impact on market returns since the probability values for all of them are less than 0.05. Furthermore, the impact of the Covid-19 pandemic on market returns is illustrated in the table above; the result indicates that there is a significant and negative relationship between the Covid-19 pandemic and market returns, meaning that if the pandemic decreases, the performance of market returns will increase. This is an indication that the pandemic has had a significant impact on real estate performance. The linkage between financial indicators and market returns is shown to be positive for all financial indicators. These results are consistent with other studies (Alswalmeh & Dali, 2019; Alswalmeh & Qaqish, 2021; Awwad & Salem, 2019; Musallam, 2018).

The liquidity ratio is a metric used to assess a firm's ability to satisfy short-term financial obligations, both within and outside the company. Kasmir (2017) declares that a company's liquidity is a critical aspect to consider when making decisions since liquidity is linked to a firm's capacity to satisfy financial obligations, and the liquidity ratio is a metric that measures how liquid a company is. The results indicated that there is a significant and positive impact of current ratio on market returns, which means that real estate companies should manage their working capital in an effective and efficient way to survive unexpected events that occur in the short term. Profits will increase as liquidity improves due to changes in the value of current assets, which continue to rise in tandem with a company's current debt. Companies with excessive liquidity are also not good because they have a lot of idle capital, which might hurt the company's profitability (Amalya, 2018). Additionally, the leverage ratio results showed a significant and positive effect of debt ratio on market returns, which means that real estate companies rely on long-term debt, such as loans and bonds, to finance their assets. Moreover, debt reliance decreases the amount of tax that companies should pay to the government, referred to as a tax shield. A tax shield is defined as taxable income reduction. The results of the leverage ratio are consistent with the pecking order theory (Almansour, Alrawashdeh, & Almansour, 2020).

One of the most widely used market ratios by investors and analysts is the price-to-earnings ratio to determine whether stock price is overvalued or undervalued. Multiple results showed a significant and positive effect of the P/E ratio on market returns, which means that an investor is willing to pay more Jordanian dinars for 1 JD of current earnings as long as the market return increases. The market-to-book ratio compares outstanding shares' market price with the net assets of a company to evaluate whether a company's stock is over- or undervalued. The market-to-book ratio results showed a significant and positive effect of the price-to-book ratio on market returns. The earnings per share (EPS) is one of the most used figures by stockholders, analysts, and potential investors. High earnings per share is a sign of a strong financial position, higher earnings, and, therefore, a good choice for potential investors. The EPS ratio results showed a significant and positive effect on market returns. Profitable organizations have a high financial performance, which encourages investors to buy stocks. If a company succeeds in increasing its net income, then investors believe the company has a bright future. This affects demand for the company's stock, which has increased in value (Digdowiseiso & Agustina, 2022). The higher the earnings per share ratio, the better the company's worth. This is an indicator for investors when making investment decision as it shows the companies that produce higher profits and can improve shareholders' wealth (Mulyadi & Sihabudin, 2020).

## 5. CONCLUSION AND RECOMMENDATIONS

Today, there is a highly competitive environment among companies, especially in managing operations, which is associated with financial success. This leads to understanding companies' future financial decisions since they have a direct impact on these results. Therefore, financial decisions should be carefully made by management. Long-term growth in a company's value is accomplished through improving its performance for public real estate companies listed on the Amman Stock Exchange. Shareholders' wealth is proportional to the value of business because financial ratios are one of the tools used by investors to evaluate firm value, and the financial management function can optimize corporate value by effectively and efficiently explaining financial decisions related to financial ratios. This research investigates the influence of real estate financial proxies on the Amman stock index returns during the Covid-19 pandemic. By employing a panel data analysis, the pooled effects model was selected. The results showed that all real estate financial ratios have a significant and positive impact on market returns, while the book value per share ratio has a significant and negative impact on market returns, which recorded a probability value of 0.000 and a coefficient value of -0.0482. Moreover, the results showed that the market return was significantly affected by the Covid-19 pandemic. A negative and significant association was found between the Covid-19 pandemic and market returns, meaning that if the Covid-19 pandemic is reduced, market returns will improve, indicating that the Covid-19 pandemic has a substantial impact on real estate performance.

The study's findings, as expected, point to a number of theoretical and empirical implications. This study supports the pecking order theory and clarifies the relationship between financial ratios and firm performance regarding leverage ratios. The pecking order theory concentrates on the association between financial ratios (leverage) and firm performance and assumes that firms should issue bonds before stocks in order to finance their long-term assets because the cost of debt is cheaper than the cost of equity. Moreover, the practical implication shows that investors should understand and be aware of price volatility in order to avoid high-risk investments. Additionally, investors can utilize historical financial data to calculate returns. For instance, public information, such as newly informed stock prices, earnings and dividend announcements, and mergers and stock splits, can be useful to investors. Decision makers in real estate companies must manage their working capital in an effective and efficient manner in order to deal with unforeseen short-term events.

The outcomes of this study lead to some recommendations for future studies. Future research may concentrate on the association between financial indicators and market returns during the Covid-19 pandemic by employing other financial proxies and other sectors, such as the telecommunication and insurance sectors, on the Amman



Stock Exchange. Furthermore, interested parties can focus on predicting market returns during the Covid-19 pandemic by employing autoregressive conditional heteroskedasticity (ARCH) family models. Moreover, future research could compare the results of public and private real estate enterprises in Middle Eastern countries. Finally, it would be worth expanding the number of samples in other countries as well as including other characteristics, such as management, fund sufficiency ratios and investment return ratios, or even incorporate external factors, such as tax regulation and bank interest rates, in addition to other macroeconomic factors.

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