




“Firm-specific, macroeconomic factors and stock price risk for Jordanian banks”

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FIRM-SPECIFIC, MACROECONOMIC FACTORS AND STOCK PRICE RISK FOR JORDANIAN BANKS

Abstract

Internal (firm-specific) and external (macroeconomic) determinants of stock price fluctuations are vital for investors seeking to invest their money in a firm's stocks. Thus, the main aim of this study is to explore macroeconomic and firm-specific factors that influence stock price fluctuations for all conventional banks in Jordan in 2010–2019. Ordinary least squares multiple regression (panel data) is applied for data analysis. The results report that trading volume (TV), dividend yield (DY), and Gross Domestic Product (GDP) have a positive effect on stock price volatility, while stock price volatility is statistically negatively affected by return on assets (ROA), dividend payout ratio (DPR), and price-earnings ratio (PE). On the other hand, money supply (MS) does not affect stock price volatility. Paying more dividends can reduce stock risk and, in turn, reduce stock price volatility. The findings can benefit current and potential investors, firm managers, brokers, dealers, portfolio managers, regulatory bodies, policy makers, and researchers.

Keywords

money supply, GDP, return on assets, dividends, volatility

JEL Classification

G12, G21, E44

INTRODUCTION

There is a relationship between the financial sector (financial institutions) and economic development and economic growth in all countries. In particular, banks as intermediaries grant loans to households who use these loans for the consumption of goods and services, which contributes to an increase in the gross domestic product (GDP). Furthermore, investors can use loans for purchasing shares of publicly listed firms through the capital market, resulting in an increase in firms' stock price and values. On the other hand, economic development and economic growth can support and enhance the financial sector. In Jordan, the size of the banking sector is large relative to the Jordanian economy, where the ratio of banks' total assets to GDP is 179.4% at the end of 2020, indicating the importance of banks to the Jordanian economy (Association of Banks in Jordan, 2020).

Stock investors are interested in the volatility of stocks while investing their money, and they can rely on stock volatility, a proxy of the stock risk, when estimating risk to demand a return, where high risk, high return (Baskin, 1989). However, only one type of investors can pay high attention to stock fluctuations in an attempt to avoid risk (risk-averse), while the other type of investors prefers risk in order to get high return (risk-seekers).

The determinants of stock price volatility (firm-specific and macroeconomic) are important for risk-averse and risk-seeking investors who

plan to purchase shares in publicly listed firms in order to obtain capital gains or even maintain their share in the company. Furthermore, this paper can help investors to identify the factors affecting stock price fluctuations in making their investments decisions. Firm managers can also benefit from this paper when determining the factors affecting price risk in order to reduce their firms' stock price volatility; portfolio managers can also use the findings of this paper to build diversified portfolios.

Stock price fluctuations depend on both macroeconomic (e.g., GDP, inflation, money supply, oil prices), and firm-specific factors (e.g., dividends, size, growth). Some studies focus on examining the macroeconomic determinants of stock price volatility, others examine firm-specific determinants, while a few studies examine both (macroeconomic and firm-specific variables). Furthermore, even the studies examining firm-specific or macroeconomic factors, or both, find different results. The purpose of this paper is to identify the determinants of stock price volatility in Jordan and see whether the results confirm or contradict the previous results by answering the following question: What are the determinants of stock price volatility for all conventional banks in Jordan?

1. LITERATURE REVIEW AND HYPOTHESIS

The determinants of stock price fluctuations (macroeconomics and firm-level) have attracted the attention of many researchers in developed and emerging markets (e.g., Baskin, 1989; Allen & Rachim, 1996; Nazir et al., 2010; Hussainey et al., 2011; Almanaseer, 2019; Sutrisno, 2020; Kimani & Olweny, 2021).

1.1. Previous studies in developed countries

Baskin (1989) uses cross-sectional data analysis to explore the effect of dividends on price risk for 2,344 firms in the USA from 1967 to 1986 and finds that dividend payout ratio, dividend yield, and size have a negative effect on price risk, while earnings volatility and leverage have a positive effect on price risk. In another study in Australia, Allen and Rachim (1996) investigate the impact of dividends on price risk for a sample of 173 companies through the period 1972–1985 using cross-sectional regression analysis. They show that dividend payout ratio has a negative effect on stock price volatility, while earnings volatility, financial leverage, and size have a positive effect on price risk. They also find no relationship between dividend yield and price risk. In another related study in the UK, Hussainey et al. (2011) examine the effect of dividends on price risk for a sample of firms over 10 years by using cross-sectional data regression analysis. The results report that dividends have a negative effect on price risk. In a re-

cent study in the USA, Suwanhirunkul and Masih (2018) find that dividend yield has a positive effect on price risk.

1.2. Previous studies in emerging markets

Nazir et al. (2010) explore the relationship between dividends and price risk for 73 companies in Pakistan through the period 2003–2008 using OLS multiple regression analysis. They find that dividend yield and size have a positive effect on price risk, while price risk is negatively affected by dividend payout ratio. In a related study in Nairobi, Ngugi (2017) examines the effect of firm-specific and macroeconomic factors on stock price volatility for 61 firms for the period 2010–2016 using panel data regression analysis, and finds that GDP, inflation, dividends, and trading volume have a positive effect on price risk. In another study in Nepal, Gautam (2017) examines the effect of a set of firm-level factors on price risk and return for 20 banks through the period 2009–2016 by using panel data regression analysis. Results report that price risk is positively influenced by financial leverage, payout ratio, and dividend yield, while negatively affected by market capitalization, book-to-market ratio, assets growth, and earnings-price ratio. Zainudin et al. (2018) use panel data regression analysis to explore the relationship between dividends and price risk for 166 companies in Malaysia over the period 2003–2012. The results show that size, dividend yield, and payout ratio have a negative effect on price risk, while earnings volatility and assets growth have a posi-

tive effect on price risk. Bhattarai (2018) uses OLS multiple regression model to explore the factors affecting stock prices in Nepal for a sample of 13 financial firms. He finds that stock price is negatively affected by ROA, ROE, money supply, and interest, while positively affected by earnings per share, dividends per share, price-earnings ratio, size, and GDP. On the other hand, he finds that the exchange rate and payout ratio have no effect on stock price.

In a recent study in Pakistan, Khan (2019) uses panel data regression analysis to explore the effect of dividends on price risk for a sample of 10 firms for 10 years, and finds that payout ratio has a negative effect on price risk, while dividend yield has a positive effect on price risk. In another recent study in Sri Lanka, Kengatharan and Ford (2019) examine the effect of firm-specific and the macroeconomic factors on stock price volatility for 72 firms over the period 2013–2017 using panel regression analysis. The results show that payout ratio, dividend per share, earnings volatility, and size have a negative effect on price risk, while dividend yield, GDP, and leverage have a positive effect on price risk. In a recent study in Indonesia, Sutrisno (2020) examines the effect of firm-level and macroeconomic factors on price risk for 16 firms over the period 2014–2018 by using panel data. He finds that trading volume has a positive effect on price risk, while size has a negative effect on price risk. On the other hand, stock price volatility is not affected by inflation rate and exchange rate. In most recent study in Kenya, Kimani and Olweny (2021) investigate the relationship between dividends and price risk banks over the period 2015–2019 using panel data OLS multiple regression. The results report that payout ratio has a negative effect on price risk, while dividend yield has no effect on price risk. In another most recent study in Sri Lanka, Kengatharan and Ford (2021) explore the effect of dividends on price risk and find that dividend yield has a positive effect on price risk, however, payout ratio has no effect on price risk.

1.3. Previous studies in Jordan

Al-Shawawreh (2014) uses panel data regression analysis to explore the relationship between firm-specific variables and price risk for 53 firms

over the period 2001–2013 and finds that payout ratio and stock dividends have a positive effect on price risk, while they are positively affected by dividend yield and size. In another related study, Al Qudah and Yusuf (2015) examine the impact of dividends on price risk for 2001–2011 by applying regression analysis (OLS). The results show that payout ratio, firm size, earnings volatility, and financial leverage have a negative effect on price risk, while dividend yield has no effect on price risk. In a recent study, Almanaseer (2019) uses multiple ordinary least squares (OLS) analysis to identify the firm-specific determinants of stock price volatility for 20 firms over the period 2008–2017 and finds that dividend yield and payout ratio have a negative effect on price risk.

The contribution of this paper is to bridge the gap in the literature regarding macroeconomic and firm-level determinants of stock price fluctuations in Jordan. All previous studies in Jordan took into account firm-specific variables only, while this paper considers both macroeconomic and firm-specific variables. So, this paper is an attempt to examine the effect of dividend yield, payout ratio, trading volume, return on assets, price-earnings ratio, GDP, and money supply on stock price fluctuations for all conventional banks in Jordan for 2010–2019. Thus, the following hypothesis can be formulated:

H0: Firm-level and macroeconomic factors have no effect on stock price fluctuations.

2. METHOD

To examine macroeconomic and firm-level factors affecting price risk, data for all conventional banks in Jordan over 2010–2019 are obtained from two main sources: Data on firm-level variables (dividends, return on assets, price-earnings ratio, and trading volume) are taken from the firms' audited financial statements (ASE, 2021), while data regarding macroeconomics factors (GDP and money supply) are taken from the Central Bank of Jordan (CBJ, 2021). As a sample, 13 commercial banks are taken for data analysis. Balanced panel data, OLS multiple regressions, pooled data, fixed effect, and random effect models are applied for data analysis.

Table 1. Variable measurement

Variable	Symbol	Measurement	Source
Price risk	<i>P-VOL</i>	Low price is subtracted from high price and divides the product by the average, then squared and the square root is extracted	Parkinson (1980), Baskin (1989)
Dividend yield	<i>DY</i>	Dividend per share over price per share	Baskin (1989)
Payout ratio	<i>DPR</i>	Dividend per share over earnings per share	Baskin (1989)
Trading volume	<i>TV</i>	Natural logarithm (LN) of the trading volume	Ngugi (2017)
Return on assets	<i>ROA</i>	Net income over total assets	Bhattarai (2018)
Price-earnings ratio	<i>PE</i>	Price per share over earnings per share	Bhattarai (2018)
Gross domestic product	<i>GDP</i>	Current GDP is subtracted from previous GDP, then divides the product by previous GDP	Kengatharan and Ford (2019), Ngugi (2017)
Money supply	<i>MS</i>	Current M2 is subtracted from previous M2, then divides the product by previous M2	Bhattarai (2018)

Table 1 represents the measurements of the dependent variable and explanatory variables.

The following model is used to identify the factors affecting stock price risk:

$$\begin{aligned}
 P-VOL_{i,t} = & \alpha + \beta 1 DY_{i,t} + \\
 & + \beta 2 DPR_{i,t} + \beta 3 LNTV_{i,t} + \\
 & + \beta 4 ROA_{i,t} + \beta 5 P-E_{i,t} + \\
 & + \beta 6 GDP_t + \beta 7 MS_t + \varepsilon,
 \end{aligned} \quad (1)$$

where *P-VOL* – Price risk; *DY* – Dividend yield; *DPR* – Payout ratio; *LNTV* – Natural logarithm of trading volume; *ROA* – Return on assets; *P-E* – Price-earnings ratio; *GDP* – Gross domestic product; *MS* – Money supply; *i, t* – firm and year, respectively; α – intercept; $\beta 1.. \beta 7$ – partial slope coefficients; ε – Error term.

3. RESULTS

Table 2 presents the summary statistics of all explanatory variables and the dependent variable.

Table 2. Summary statistics

Variable	Mean	Standard deviation
<i>P-VOL</i>	0.2638	0.1261
<i>LNTV</i>	16.056	1.8217
<i>DY</i>	0.0431	0.0306
<i>ROA</i>	0.0119	0.0048
<i>GDP</i>	0.0261	0.0052
<i>MS</i>	0.0579	0.0348
<i>DPR</i>	0.4655	0.3228
<i>PE</i>	14.3469	19.3982

Note: The number of observations is 130.

Table 2 shows that the mean and the standard deviation of price risk are 0.26 and 0.126 respectively, indicating a slight variation among banks concerning *P-VOL*. The mean value of Trading volume is 16, and its standard deviation is 1.8. The mean value of Dividend yield is 0.04, and its standard deviation is 0.03, implying a slight variation among banks regarding *DY*. The mean value of Return on assets is 0.1, and its standard deviation is 0.005, implying a very slight variation among banks regarding *ROA*. The mean value of Dividend payout ratio is 0.47, and its standard deviation is 0.32, implying a slight variation among banks concerning *DPR*. Finally, the mean value of the Price-earnings ratio is 14.3, and its standard deviation is 19.40, implying high variations among banks regarding *PE*, where some banks have negative *PE*, while others have very large *PE*.

Table 3 shows the results of detecting the multicollinearity problem among all explanatory variables.

Table 3. Multicollinearity

Variable	VIF	1/VIF
<i>DY</i>	3.82	0.2614
<i>DPR</i>	3.29	0.3037
<i>MS</i>	2.16	0.4638
<i>GDP</i>	1.98	0.5039
<i>ROA</i>	1.49	0.6723
<i>PE</i>	1.15	0.8666
<i>LNTV</i>	1.13	0.8881
Mean VIF	2.15	

Table 3 shows that the value of the Variance Inflation Factor (VIF) for all explanatory variables are lower than for both (5 and 10), indicating that there is no multicollinearity problem (Gujarati & Porter, 2010; Wooldridge, 2013).

Table 4 presents the Hausman test results used to determine whether the random or fixed effect model is most applicable.

Table 4. Hausman test results

Variable	Coefficients			
	(b)	(B)	(b-B)	Sqrt (diag (v_b - v_B))
	Fe	Re	Difference	S.E.
LNTV	0.0205	0.0199	0.0006	0.0081
DY	1.4204	1.6449	-0.2245	0.5499
ROA	-10.9151	-7.5366	-3.3785	2.7544
GDP	6.7466	6.1946	0.552	0.5037
MS	-0.0596	-0.0747	0.015	0.0869
DPR	-0.1381	-0.1524	0.0142	0.0521
PE	-0.0015	-0.0011	-0.0003	0.0002

Note: *b* – consistent under *H₀* and *H_a*, obtained from xtreg; *B* – inconsistent under *H_a*, efficient under *H₀*, obtained from xtreg; test: *H₀*: difference in coefficients not systematic $\chi^2(6) = (b - B), [(v_b - v_B)^{-1}] (b - B) = 3.52$; Prob. > $\chi^2 = 0.7411$.

Table 4 shows that the probability is higher than 0.05, indicating that the random effect model is the most applicable (Gujarati & Porter, 2010; Wooldridge, 2013).

Table 5 presents the model regression results based on the random effect model.

Table 5. Random effect regression results

Random-effect GLS regression	Number of observations = 130
Group variable: firm1	Number of groups = 13
R-sq:	Observations per group:
within = 0.1629	min = 10
between = 0.4103	avg = 10.0
overall = 0.1936	max = 10
corr (u_i, x) = 0 (assumed)	Wald $\chi^2(7) = 28.09$
Prob > $\chi^2 = 0.0002$	

P-VOL	Coef.	Std. err.	Z	P > Z	[95% conf. interval]	
LNTV	0.0199	0.0064	3.11	0.002	0.0073	0.0324
DY	1.6449	0.6802	2.42	0.016	0.3117	2.9781
ROA	-7.5366	2.7052	-2.79	0.005	-12.8388	-2.2343
GDP	6.1946	2.7075	2.29	0.022	0.8879	11.5012
MS	-0.0747	0.4285	-0.17	0.862	-0.9146	0.7652
DPR	-0.1524	0.0602	-2.53	0.011	-0.2704	-0.0343
PE	-0.0011	0.0005	-2.07	0.039	-0.0023	-0.0001
_cons	-0.1072	0.111	-0.97	0.334	-0.3249	0.1103
sigma_u	0.0199	Fraction of variance due u_i				
sigma_e	0.1157					
roh	0.0288					

4. DISCUSSION

Table 5 shows that stock price volatility is statistically positively affected by trading volume, implying that the greater the trading volume, the higher the stock price volatility, and vice versa. Investors in the stock market mainly rely based on information from the market when making their investment decisions, when they receive good and accurate information from the market, they will buy and sell stocks, which leads to an increase in trading volume, and then price risk and volatility will increase and vice versa (Sutrisno, 2020). This finding is consistent with Ngugi (2017) and Sutrisno (2020). Dividend yield is statistically positively affected by price risk, implying that the higher the dividend yield, the higher the price risk, and then the higher the stock price volatility. Increasing dividend yield could be as a result of decreasing stock price, which leads to an increase in price risk, and then an increase in stock price fluctuations. This result is consistent with Al-Shawawreh (2014), Suwanhirunkul and Masih (2018), Nazir et al. (2010), Kengatharan and Ford (2019), and Khan (2019), while inconsistent with Hussainey et al. (2011), Baskin (1989), and Almanaseer (2019). Return on assets is statistically negatively affected by stock price volatility, indicating that the higher the return on assets, the lower the price risk, and then the lower the stock price volatility. Increasing return on assets is a result of increasing firms' profits, which attract more investors for buying firms' stocks, leading to an increase in stock price, and then price risk and stock price volatility. This finding is consistent with Bhattarai (2018). GDP is statistically positively affected by stock price volatility, implying that the higher the GDP, the higher the stock price volatility. The stock price index as a whole and its volatility are affected by changes in the GDP growth rate. This result is consistent with Ngugi (2017) and Kengatharan and Ford (2019). Stock price volatility is statistically negatively affected by payout ratio, implying that the higher the payout ratio, the lower the price risk, and then the lower the stock price volatility. Paying dividend could be a good signal for investors about the firm's performance, which attract more investors to purchase its shares, resulting in increasing stock price, and then declining price risk and volatility. This finding is consistent with Allen and Rachim (1996), Hussainey et al. (2011), Baskin

(1989), Almanaseer (2019), Al-Shawawreh (2014), and Al Qudah and Yusuf (2015), while inconsistent with Gautam (2017). Stock price volatility is statistically negatively affected by price-earnings ratio, implying that the higher the price-earnings ratio, the less the stock price volatility. High price-earnings ratio means that the firm's stock price increases through the time, which leads to a decrease in price risk and stock price fluctuations. This finding is inconsistent with Bhattarai (2018). Finally, money supply has no significant effect on price risk, which is inconsistent with Bhattarai (2018).

CONCLUSION

This paper aims to examine macroeconomic and firm-specific determinants of price risk for commercial banks in Jordan during 2010–2019 using multiple OLS regressions. The results report that trading volume, dividend yield, and GDP are positively affected by price risk, while return on assets, payout ratio, and price-earnings ratio are statistically negatively affected by stock price volatility. In contrast, the money supply does not significantly affect price risk.

This study is an attempt to reduce the dearth in the emerging markets in terms of macroeconomic and firm-specific price risk determinants by examining the impact of GDP, money supply, dividend yield, payout ratio, trading volume, return on assets, and price-earnings ratio on price risk in Jordan.

In this study, firm managers are recommended to increase dividends to reduce stock risk and then reduce stock price volatility, as well as to increase return on assets and price-earnings ratios to reduce stock price risk and stock price volatility. Furthermore, the effect of inflation, interest, foreign direct investment, size, and cash ratio on price risk can be taken into account for further research.

AUTHOR CONTRIBUTIONS

Conceptualization: Wasfi Al Salamat, Mohammad Q.M. Momani, Khaled Batayneh.

Data curation: Wasfi Al Salamat, Mohammad Q.M. Momani, Khaled Batayneh.

Formal analysis: Wasfi Al Salamat, Mohammad Q.M. Momani, Khaled Batayneh.

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