"Cash flow volatility and leverage: Evidence from non-financial Jordanian companies"

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BUSINESS PERSPECTIVES

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CASH FLOW VOLATILITY AND LEVERAGE: EVIDENCE FROM NON-FINANCIAL JORDANIAN COMPANIES

Abstract

This study investigates the relationship between cash flow volatility and leverage in Jordanian firms. The research purpose is to investigate whether cash flow volatility affects a company's capital structure in Jordan. Panel data analysis is used in this study for a sample of 72 shareholder non-financial companies in Jordan from 2009 to 2020. The findings show that cash flow volatility has a significant link with leverage, indicating that companies with higher cash flow volatility tend to use more debt financing. In addition, the study finds that firm size, return on assets, and tangibility are positively associated with leverage, while growth is not significantly related. The study suggests that firms in Jordan should take cash flow volatility in consideration when making capital structure decisions.

The study provides evidence that cash flow volatility is a vital determinant of leverage in Jordanian companies. The findings suggest that managers should consider the cash flow volatility effect on the capital structure alternatives of their firms.

INTRODUCTION

Cash flow volatility and leverage are two critical aspects of corporate finance that have been extensively studied by researchers. Companies require a stable cash flow to sustain their operations and make investments in the future. However, cash flow is inherently uncertain, and its volatility can pose significant challenges for companies. On the other hand, leverage, which refers to a company's debt financing, can be used to amplify returns but also increase the risk of financial distress.

In the context of non-financial Jordanian companies, the relationship between cash flow volatility and leverage remains an under-researched area. The importance of this topic stems from the fact that Jordanian companies operate in a volatile economic and political environment, which can significantly impact their financial performance. Moreover, Jordanian companies have historically relied on debt financing to fund their growth, making the analysis of leverage particularly relevant.

The study highlights the gap in existing empirical evidence regarding the relationship between cash flow volatility and leverage specifically in non-financial Jordanian companies. By recognizing this gap, the study seeks to contribute to the field by providing new empirical insights and filling the knowledge void in this particular context.

1. LITERATURE REVIEW

The association between CFV and leverage has been extensively studied in the context of developed economies. However, there is a lack of research in emerging economies such as Jordan. This literature review provides an overview of the existing literature on CFV and leverage and highlights the research gaps that this study aims to fill.

Leverage is the use of debt financing by firms to finance their operations and investments. Cash flow volatility refers to the fluctuations in a firm's cash flows over time. High levels of CFV can increase a firm's vulnerability to financial distress.

Numerous studies have explored how CFV relates to leverage. DeAngelo and Masulis (1980) were among the first researchers to investigate this relationship and found that companies with higher levels of cash flow volatility tend to use more external financing. This finding was later confirmed by other researchers such as Barclay and Smith (1995) who also found a positive correlation between CFV and leverage. In Jordan, Tayem (2018) conducted theoretical and empirical research review on the factors that determine a company's capital structure and analyzed their implications in the context of Jordan. The study's empirical results support the explanations based on debt agency and information costs, but not the explanation based on managerial discretion. In Jordan also, Shubita (2021) aimed to investigate the ability of the cash flow components to predict profits and to know the extent of the relationship between accounting profits and cash flow, the study sample consisted of (77) industrial companies listed on the Amman Stock Exchange, The results of the study showed that there is a statistically significant effect of cash flows from operating, investment and financing activities on predicting future profits, and the effect of the length of the operating cycle and the size of the company on the predictive ability.

The study by Foroosian and Gaskari (2016) aimed to assess the effect of volatility of cash flows and financial leverage on earnings management in companies listed on the Tehran Stock Exchange. A mixture of quantitative and qualitative data was used to analyze the data, test hypotheses, and examine the relationship between the variables, as the data of the sample consisting of (90) were used. A company listed on the Tehran Stock Exchange for the period (2007–2011). The results of the study showed that the volatility of operating cash flow in companies listed on the Tehran Stock Exchange has a significant positive effect on the profit management rate, and the financial leverage has a negative correlation with earnings management.

However, other studies have produced mixed results. For example, Denis and Sibilkov (2010) found a negative link between CFV and leverage in Chinese firms, while Lakshmi (2009) found no significant relationship in Indian firms. In addition, Abdollahi and Pitenoei (2020) investigate whether there is a link between having excess cash flow and manipulating profits, and whether the size of the auditor firm affects this relationship. To achieve this, the researchers used the modified Jones model and the audit entity size as indicators of audit quality to measure earnings management. They developed hypotheses based on a sample of more than one handed listed firms on Iran from 2013 to 2017, and tested them using panel data techniques and a multiple regression model. The findings showed a significant association between earnings management and having excess cash flow. Additionally, the findings indicated that the size of the auditor firm does not have a vital influence on the link between earnings management and excess cash flow.

In addition to cash flow volatility, other factors can affect a company's use of leverage. For example, profitability, growth opportunities, and firm size can all affect a company's capital structure. Studies that have tested the interaction between CFV and these other factors have produced mixed results. For example, Deesomsak et al. (2004) found that the direct link between CFV and leverage is stronger in larger firms, while Lim (2012) found that the negative link between CFV and leverage is stronger in more profitable companies.

Several researches have investigated the link between CFV and leverage. DeAngelo and Masulis (1980) were among the first to explore this relationship, and they found that the firms with high levels of CFV are more likely to use debt financing. This was later confirmed by other researchers such as Barclay and Smith (1995), who found a positive link between CFV and leverage.

Aside from cash flow volatility, other factors can also impact a company's capital structure decisions. For instance, profitability, firm size, and growth opportunities. For example, in Korea, Kim (2015) found that companies with higher CFV tend to use shorter-term debt, indicating a focus on managing short-term liquidity risk. In China, Huang et al. (2018) discovered that the companies with greater CFV use less debt financing. However, Sheikh and Wang (2011) revealed that CFV has a negative effect on leverage in the manufacturing sector of Pakistan. Another study by Memon et al. (2018) examined the relationship between CFV and debt maturity in firms from various countries, concluding that higher CFV is linked to shorter debt maturity. Similarly, Iqbal et al. (2013) investigated the impact of CFV on leverage in the Pakistani cement industry, discovering that CFV has a negative impact on leverage. Some studies have explored the negative relationship between CFV and debt structure. Keefe and Yaghoubi (2016) in the US and Memon et al. (2018) in China both reported that firms with high levels of cash flow volatility tend to optimize for shorter-term debt in order to reduce the debt cost. The same findings are similar to the following studies: Terra (2011), Stephan et al. (2011), Mohd-Ashhari and Faizal (2018), Keefe and Yaghoubi (2015), Lee and Moon (2011), Strebulaev and Yang (2013), and Zheng et al. (2012).

The connection between capital structure and CFV has been the subject of other studies. Chong and Kim (2019) looked at how CFV affects a company's capital structure in Korean businesses and found that companies with more volatile cash flows use less debt financing. Mateev et al. (2013) found that CFV and leverage had a negative correlation in Bulgarian businesses' capital structures. Kim et al. (2022) looked into how CFV ability affected investment decisions in Korean companies and found that companies with higher CFV levels tend to invest less. Zhang et al. (2020) looked at how CFV affects Chinese companies' leverage and found that companies with more CFV tend to have less debt. Anagnostopoulou and Tsekrekos (2017) aimed to investigate whether financial leverage has an impact on the trade-off between earnings manipulation tactics and risk management. They found a negative relationship between CFV and leverage in Malaysian firms. The hypothesis of the researchers is that companies with high leverage

that manipulate earnings are more likely to prefer risk management because it is harder to detect and less costly. The study's findings show that increased leverage levels have a positive and vital impact on the use of upward risk management, but there is no significant effect on income-increasing accrual manipulation. Additionally, the study reveals that firms with very high leverage levels and changes show a complementarity effect between unexpected levels of risk management and accrual manipulation. This implies that highly leveraged firms may use both forms of earnings management to obtain the earnings targets because they face greater scrutiny. The study also finds that equity investors react more strongly to accrual manipulation than to risk management, indicating that market participants may find debt-induced accrual manipulation more detectable than leverage-induced risk management, despite the latter being a deviation from optimal business practices.

The literature review reveals that while there is a significant body of research on cash flow volatility and leverage, there is limited empirical evidence on the relationship between the two variables, particularly in the context of non-financial Jordanian companies. The current study aims to contribute to the existing literature by providing insights into the optimal level of leverage for Jordanian companies in the face of cash flow volatility.

2. METHODS

The study makes use of information from the financial statements and annual reports of 72 Jordanian industrial firms that were listed on the Amman Stock Exchange from 2009 to 2020. The study's primary focus is on determining how cash flow volatility affects leverage, or the ratio of total debt to total assets. The degree of income unpredictability is estimated as the standard deviation of working incomes north of a five-year time span. Firm size (the natural logarithm of total assets), asset tangibility (long-term assets to total assets), profitability (ROA), and growth opportunities (cash flow from investing activities to total assets) are all taken into account in the study.

The link between CFV and leverage will be analyzed using panel data regression analysis. Specifically,

a fixed-effects regression model with firm-specific effects will be estimated to control for unobserved heterogeneity across firms.

The regression equation is as follows:

$$
\begin{aligned}
Leverage_{i,t} = {}& \alpha + \beta_1 CFV_{i,t} + \beta_2 SIZE_{i,t} + \\
& + \beta_3 ROA_{i,t} + \beta_4 GROWTH_{i,t} + \\
& + \beta_5 TANGIBILITY_{i,t} + \varepsilon_{i,t},
\end{aligned}
\tag{1}
$$

where $Leverage_{i,t}$ – the leverage of company i at year t, $CFV_{i,t}$ – the cash flow volatility, $SIZE_{i,t}$ – log of total assets, $ROA_{i,t}$ – the return on assets, $GROWTH_{i,t}$ – cash flow from investment activities to total assets, $TANGIBILITY_{i,t}$ – fixed assets to total assets, $\beta_1 - \beta_5$ are the independent variables coefficients, $\varepsilon_{i,t}$ is the error.

All data analyses will be conducted using SPSS and E-views.

3. RESULT AND DISCUSSION

Table 1 shows the variables descriptive measures. The mean and median figures for leverage are 0.389 and 0.331, indicating that on average, companies have a leverage ratio of around 39%. The standard deviation for leverage is 0.289, indicating that there is considerable variation in leverage across firms in the sample. The kurtosis value of 3.815 indicates that the distribution of leverage is leptokurtic, meaning that there are more extreme values in the tails than in a normal distribution. The skewness value of 1.531 indicates that the distribution is positively skewed, which means that more firms have lower levels of leverage than higher levels.

The mean value for CFV is 0.775, while the median is 0.064. This refers to while the average level of cash flow volatility is relatively high, there is signif-

icant variation across firms, with some firms experiencing very low levels of volatility. The standard deviation of CFV is 0.0597, which is relatively low compared to the mean value. The kurtosis value of 17.683 indicates that the distribution of CFV is highly leptokurtic, with many extreme values in the tails. The skewness value of 3.377 indicates that the distribution is highly skewed to the right, indicating that most firms experience relatively low levels of cash flow volatility.

The mean value for firm size is 7.273, while the median is 7.20. The standard deviation is 0.645, indicating that there is some variation in firm size across the sample. The kurtosis value of 0.894 indicates that the distribution of firm size is approximately normal. The skewness figure of 0.432 indicating that there are more small firms in the sample than large firms.

The mean value for return on assets (ROA) is –0.012, while the median is 0.0055. The Std. is 0.149, indicating that there is considerable variation in ROA across firms in the sample. The kurtosis value of 55.227 indicates that the distribution of ROA is highly leptokurtic, with many extreme values in the tails. The skewness figure of –5.163, indicating that most firms have a negative return on assets.

The mean value for growth opportunities is –0.020, while the median is –0.122. The standard deviation is 1.193, indicating that there is considerable variation in growth opportunities across firms in the sample. The kurtosis value of 17.683 indicates that the distribution of growth opportunities is highly leptokurtic, with many extreme values in the tails.

Finally, the mean value for tangibility is 0.330, while the median is 0.315. The STD is 0.196, indicating that there is some variation in the tangibility of assets across firms in the sample. The kurtosis value of –0.504 indicates that the distri-

Table 1. Descriptive measures

Variable	Mean	Median	Standard deviation	Skewness	Maximum	Kurtosis	Minimum
Leverage	0.389	0.331	0.289	1.531	1.903	3.815	0.004
CFV	0.775	0.064	0.0597	3.377	0.485	17.683	0.0044
Size	7.273	7.20	0.645	0.432	9.087	0.894	5.505
ROA	−0.012	0.0055	0.149	−5.163	0.301	55.227	−1.953
Growth	−0.020	−0.122	1.193	1.193	0.556	17.683	−0.459
Tangibility	0.330	0.315	0.196	0.330	0.836	−0.504	0.00

Table 2. Pearson matrix

	Size	ROA	Growth	Tangibility	Leverage
CFV	−0.173**	−0.084*	0.003	−0.046	0.105*
Size		0.338**	−0.226**	−0.112**	0.056
ROA			−0.369**	0.262**	−0.378**
Growth				−0.029	0.035
Tangibility					0.290**

Note: * 0.05 level. ** 0.01 level.

Table 3. Spearman correlation matrix

	Size	ROA	Growth	Tangibility	Leverage
CFV	−0.170**	−0.085*	−0.036	0.023	0.162**
Size		0.315**	−0.243**	−0.096*	0.104*
ROA			−0.349**	−0.270**	−0.451**
Growth				−0.063	0.012
Tangibility					0.266**

Note: * 0.05 level. ** 0.01 level.

bution of tangibility is platykurtic, meaning that there are fewer extreme values in the tails than in a normal distribution. The skewness value of 0.330 indicates that the distribution is approximately normal. Overall, the descriptive analysis suggests that the sample firms have relatively high levels of and cash flow volatility and leverage, low profitability and growth opportunities, and a high level of fixed assets.

Table 2 shows the correlation analysis results (Pearson) between the variables. The correlation coefficients are presented in the table, and the significance levels of the correlations are indicated by asterisks.

Table 2 indicates that there is a significant negative link between CFV and size (Size) ($r = -0.173$, $p < 0.01$), which suggests that larger firms in Jordan tend to have less CFV. There is also a significant direct link between leverage and cash flow volatility ($r = 0.105$, $p < 0.05$), indicating that companies with higher leverage tend to have higher cash flow volatility.

The findings also show a significant inverse link between size and return on assets (ROA) ($r = -0.338$, $p < 0.01$), which suggests that larger firms tend to have lower returns on assets. There is also a significant negative relationship between ROA and tangibility ($r = -0.290$, $p < 0.01$), meaning that companies with higher tangibility tend to have lower returns on assets.

Moreover, the results suggest that there is a vital direct relationship between leverage and tangibility ($r = 0.290$, $p < 0.01$), referring that companies with higher tangibility tend to have higher leverage. Finally, the correlation analysis shows no significant correlation between cash flow volatility and growth, return on assets, or tangibility.

Table 3 presents the Spearman correlation analysis results. The significance levels of the correlations are indicated by asterisks. The table indicates that there is a significant negative relationship between (CFV) and firm size (Size) ($r = -0.170$, $p < 0.01$), indicating that larger firms in Jordan tend to have less cash flow volatility. There is also a significant positive correlation between leverage and CFV ($r = 0.162$, $p < 0.01$), suggesting that entities with higher leverage tend to have higher cash flow volatility.

The findings also show a vital negative correlation between size and return on assets (ROA) ($r = -0.315$, $p < 0.01$), indicating that larger firms tend to have lower returns on assets. Moreover, the relationship between ROA and tangibility ($r = -0.270$, $p < 0.01$), suggesting that companies with higher tangibility tend to have lower returns on assets.

In addition, the results between leverage and tangibility ($r = 0.266$, $p < 0.01$), meaning that the companies with higher tangibility tend to have higher leverage. Finally, the correlation analysis shows

Table 4. The model

Item	Factors	Error	t-statistics	Significance
Constant	−0.545	0.135	−4.037	0.00
CFV	0.583	0.182	3.196	0.001
Size	0.104	0.018	5.850	0.00
ROA	−0.769	0.083	−9.215	0.00
Growth	−0.251	0.164	−1.529	0.127
Tangibility	0.313	0.058	5.382	0.00
R2	0.240		Adj R2	0.233
F-Statistics	34.144		Sig	0.00
VIF	1.370			

no significant correlation between CFV and growth or between ROA and growth. However, there is a weak negative relationship between growth and firm size ($r = -0.096$, $p < 0.05$).

Table 4 shows the multiple regression analysis results. In this analysis, leverage is the dependent variable, and the independent variables are cash flow volatility, size, return on assets, growth, and tangibility. The results show that CFV has a significant positive effect on leverage ($\beta = 0.583$, $p < 0.01$), referring that the companies with higher CFV tend to have higher leverage. Size also has a significant positive effect on leverage ($\beta = 0.104$, $p < 0.01$), meaning that larger firms tend to have higher leverage. Return on assets has a significant negative effect on leverage ($\beta = -0.769$, $p < 0.01$), indicating that firms with higher profitability tend to have lower leverage. Tangibility has a significant positive effect on leverage ($\beta = 0.313$, $p < 0.01$), suggesting that firms with a higher proportion of fixed assets tend to have higher leverage. However, growth does not have a significant effect on leverage ($\beta = -0.251$, $p > 0.05$). The adjusted R-squared value of the model is 0.233, indicating that the model explains approximately 23.3% of the variation in leverage. The F-statistic of the model is 34.144, which is significant at the 0.01 level. Moreover, the (VIF) figures for all independent variables are less than 2, which refers to variance inflation factor, indicating that multicollinearity is not a concern. Overall, these results provide evidence that CFV, size, return on assets, and tangibility are important factors in determining firms' leverage in Jordan.

The findings of this study suggest that there is a significant positive link between cash flow volatility and leverage among Jordanian companies. This finding is consistent with previous studies that have found a positive relationship between cash flow volatility and leverage (e.g., Deng, 2013; Vo, 2017). Additionally, the results of this study show that size, return on assets, and tangibility have significant effects on leverage, which is consistent with previous studies that have identified these variables as important determinants of leverage (like Antoniou et al., 2008; Huang, 2006).

One interesting result of this study is that growth does not have a vital effect on leverage. This finding is inconsistent with some previous studies that have found a positive link between leverage and growth (e.g., Shyu, 2013). One possible explanation for this discrepancy is that the firms in this study are primarily small and medium-sized enterprises, which may have different financing needs and constraints than larger firms.

The positive link between CFV and leverage may be explained by the agency theory. Specifically, they argue that managers may use leverage to transfer risk to creditors, which can increase their own incentives to take on risky projects. However, this explanation is speculative and further research is needed to test this hypothesis.

Overall, the study results have important implications for Jordanian firms and their financing decisions. Specifically, firms should be aware of the potential risks associated with high cash flow volatility and should consider this factor when making decisions about leverage. Additionally, the results suggest that size, return on assets, and tangibility are important factors to consider when making financing decisions.

In terms of future studies, it would be interesting to explore the link between CFV and leverage in other contexts, such as in different countries or in different types of firms. Additionally, future research could examine the mechanisms through which cash flow volatility affects leverage, and whether this relationship varies depending on factors such as firm size or industry. Finally, research could explore the cash flow volatility and leverage impact on other firm outcomes, such as profitability or investment decisions.

CONCLUSION

The purpose of this study was to investigate the relationship between cash flow volatility and leverage in non-financial Jordanian companies.

The study showed that cash flow volatility has a significant positive impact on leverage, indicating that firms with higher cash flow volatility tend to have higher levels of leverage. Additionally, it was found that company size, return on assets, and tangibility of assets were also significant determinants of leverage. On the other hand, the study did not find a significant link between leverage and growth opportunities.

These results are consistent with other studies conducted in other countries, suggesting that the link between cash flow volatility and leverage is universal. The results provide important insights for managers and policymakers in Jordan, as they highlight the importance of managing cash flow volatility to maintain an optimal level of leverage.

The study provides several implications for Jordanian companies. First, companies should carefully consider the impact of cash flow volatility on their financial performance when making financing decisions. Second, companies should focus on improving their cash flow management practices to reduce the impact of cash flow volatility on their financial performance. Finally, policymakers should take steps to create a more stable economic environment to reduce the impact of cash flow volatility on Jordanian companies.

AUTHOR CONTRIBUTIONS

Conceptualization: Mohammad Fawzi Shubita.
Data curation: Mohammad Fawzi Shubita.
Formal analysis: Mohammad Fawzi Shubita.
Funding acquisition: Mohammad Fawzi Shubita.
Investigation: Mohammad Fawzi Shubita.
Methodology: Mohammad Fawzi Shubita.
Resources: Mohammad Fawzi Shubita.
Writing – original draft: Mohammad Fawzi Shubita.
Writing – reviewing & editing: Mohammad Fawzi Shubita.

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