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Debt maturity structure and stock price crash risk in African economies: the moderating role of accounting standards

Abstract

This study examines the influence of debt maturity structure on stock price crash risk (SPCR) in African economies, focusing on the moderating role of accounting standards such as the IFRS and national GAAP. Drawing on data from 514 publicly listed non-financial firms across six countries: Nigeria, South Africa, Kenya, Egypt, Ghana, and Morocco spanning the period from 2007 to 2020, the research employs generalized least squares panel regression to test its hypotheses. The findings indicate that debt maturity significantly reduces SPCR, with this effect being more pronounced in developing economies where robust accounting standards are better enforced. The study reveals that higher-quality financial reporting frameworks enhance transparency and reduce information asymmetry, thereby amplifying the beneficial impact of debt maturity on SPCR. These insights underscore the critical role of debt maturity and stringent accounting standards in strengthening financial stability and corporate governance. By addressing a notable gap in the literature, this research offers valuable implications for policymakers, regulators, and investors in African markets.

Keywords: stock price crash risk, debt maturity, IFRS, GAAP, African economies, generalized least squares
JEL Classification: G15, G32, M41, G34, E44

Introduction

Debt financing remains a vital avenue for businesses to secure capital, as highlighted by Alcock et al. [2014]. It is crucial for a company's future viability and its ability to maximize shareholder value. Modigliani and Miller [1958] argued that in perfectly competitive capital markets a firm's capital structure does not affect its value, positing that the cost of equity rises with increased debt levels. Conversely, Jensen and Meckling [1976] present a different perspective through their agency theory, suggesting that shareholders particularly in highly leveraged firms might exploit creditors by engaging in risky ventures. This reflects the inherent conflict of interest within a company's financial structure. The agency theory emphasizes the importance of monitoring mechanisms, such as debt, to curb managerial opportunism and align the interests of managers with those of shareholders and creditors.

Another relevant theoretical perspective is the theory of asymmetric information. Akerlof [1970] proposed that different parties involved in financial transactions often possess varying levels of information, potentially leading to inefficiencies and market failures. This theory is particularly relevant in discussions of debt and stock price crash risk (SPCR), as managers typically have more information about the company's financial health and prospects than creditors or external investors. Consequently, companies may take steps to conceal their true financial performance, which could result in moral hazard and adverse selection issues. In this context, debt financing can serve as a signaling mechanism where companies with promising futures are willing to incur debt costs to signal their quality to the market, thus alleviating information asymmetry.

The decision between debt and equity, as well as the maturity of debt, is critical for optimizing company value. Short-term debt is often perceived as the optimal solution to address underinvestment issues [Myers, 1977]. Companies typically opt for short-term debt to signal credibility and motivate the market [Shyu, Lee, 2009]. Conversely, debt maturity serves several important functions. Firstly, firms in developing countries that rely heavily on short-term debt are more susceptible to interest rate risks, including refinancing challenges when loans need to be renewed [Arslan, Karan, 2006]. Secondly debt maturity can mitigate liquidity concerns by preventing lenders from withdrawing funds abruptly [Diamond, 1991]. Finally, the tax advantages associated with debt maturity can enhance company value, particularly in rising interest rate environments [Brick, Ravid, 1985].

The 2007–2008 global financial crisis and high-profile corporate scandals, such as those involving Enron, WorldCom, and Satyam, have prompted extensive research into the causes of stock market crashes. Patel and Sarkar [1998] define a stock market crash as a sudden and severe decline in an index's value from its recent peak. SPCR refers to the probability of such significant and abrupt price drops, often precipitated by management's withholding of negative information, which, when disclosed, leads to a sharp decrease in stock prices [Chang et al.,

2017; Ge et al., 2024; Hutton et al., 2009]. A key component of SPCR involves the hoarding of bad news due to potential agency conflicts [Hutton et al., 2009; Jin, Myers, 2006].

Managers may choose to withhold negative information for self-serving reasons, such as engaging in negative net present value projects, avoiding taxes, or obstructing transparent financial reporting. Motivated by personal career advancement and compensation, these actions, such as manipulating earnings to sustain inflated stock prices, can ultimately lead to significant price declines once the underlying facts emerge. Jin and Myers [2006] contend that SPCR results from the interaction between information asymmetry among managers and shareholders, compounded by self-serving managerial behaviour. Hasan et al. [2021] assert that the characteristics of debt contracts, particularly their maturity lengths, can discourage managers from withholding bad news over prolonged periods, thereby influencing SPCR.

Research indicates that debt can mitigate SPCR through direct creditor involvement or the threat of bankruptcy, which serves as a check on robust corporate governance practices [Chauhan et al., 2015; Wang et al., 2020]. D'Mello and Miranda [2010] suggest that debt servicing requirements can deter speculative or irregular investments, thereby reducing crash likelihood. Regular scrutiny associated with debt renewal and refinancing restricts managers' ability to conceal unfavourable information, minimizing conflicts with shareholders and, consequently, the risks of crashes [Dang et al., 2018; Hasan et al., 2021]. Furthermore, effective corporate governance and transparent reporting facilitate firms in securing long-term debt, which not only reduces SPCR but also addresses agency problems associated with information asymmetry, as lenders are often reluctant to provide long-term financing to firms exhibiting significant information asymmetries [Allaya et al., 2022; Nguyen et al., 2019].

Accounting standards, such as national GAAP or the IFRS, play a pivotal role in moderating the relationship between debt maturity and SPCR by diminishing information asymmetry and fostering transparency in financial reporting. These standards mandate uniform and comprehensive disclosures, allowing stakeholders to evaluate better firms' financial health, debt sustainability, and associated risks, thus reducing the likelihood of unexpected stock price crashes. For instance, IFRS adoption in countries like South Africa, Nigeria, and Kenya has enhanced the comparability and reliability of financial information, enabling debt maturity to serve as a stronger signal of financial stability. By ensuring that critical details such as financial instruments, contingent liabilities, and risk exposures are disclosed, accounting standards bolster investor and creditor confidence, making firms less vulnerable to SPCR. However, the effectiveness of these standards depends significantly on their enforcement. In economies with robust IFRS implementation, such as South Africa, the moderating effect is pronounced, leading to greater reductions in SPCR. Conversely, in countries where national GAAP enforcement is weaker, information gaps persist, limiting the ability of debt maturity to mitigate SPCR effectively.

SPCR remains a multifaceted concept, characterized by competing theories and ongoing debates. There exists a notable knowledge gap regarding the role of debt maturity in SPCR within African countries, as most of the existing research has focused on Western contexts.

Findings from studies in these regions may not be directly applicable to African nations due to unique contextual factors. Comprehensive research on the relationship between debt maturity and SPCR in African countries has been limited. Habib et al. [2018] emphasized the need for additional studies on debt maturity structures outside Western contexts, while Haider, Ahmad, and Wu [2023] explored the impact of debt maturity on SPCR in Asian countries, both emerging and developed. Their findings pave the way for further research in diverse geographical contexts. This study aims to address these gaps by investigating the factors that mitigate SPCR, building upon previous research, and offering new insights into these dynamics in African economies.

This study seeks to bridge the gap by examining the relationship between debt maturity and SPCR in the context of African countries, with a focus on the moderating role of accounting standards like the IFRS and national GAAP. It builds upon the research conducted by Haider, Ahmad, and Wu [2023], which explored the role of debt maturity in SPCR in Asian economies. A heavy reliance on short-term debt may constrain managerial self-serving activities due to increased scrutiny and regulatory constraints [Fung, Goodwin, 2013; Rajan, Winton, 1995]. This study emphasizes the importance of debt maturity in diminishing managerial tendencies to suppress negative information, thus lowering SPCR. Robust accounting standards that enhance financial transparency and reporting consistency, such as national GAAP or the IFRS, also moderate this relationship by alleviating SPCR and information asymmetries. The analysis utilizes annual data from 514 listed non-financial firms across six African countries (South Africa, Nigeria, Kenya, Egypt, Morocco, Ghana) from 2007 to 2020. The sample is categorized into three groups: firms in emerging economies, firms in developing economies, and the overall sample. Panel regression utilizing generalized least squares is employed to analyze the data and test the hypotheses.

This study makes a significant contribution to the literature by addressing the knowledge gap concerning the relationship between debt maturity and SPCR in the context of African economies. It highlights the pivotal role of accounting standards specifically national GAAP and the IFRS and emphasizes the necessity of financial transparency in diminishing information asymmetry and mitigating SPCR. The findings underscore the importance of debt maturity in bolstering corporate governance practices and curbing managerial opportunism, particularly in emerging nations. This research offers new insights into how firms in emerging and developing African economies can effectively manage SPCR through appropriate debt maturity structures and robust accounting standards, forming a basis for policy recommendations aimed at enhancing financial stability in these regions.

Literature review and hypothesis development

Debt maturity and stock price crash risk

According to Miller and Modigliani [1961], firms do not concern themselves with whether they choose debt or equity financing in a capital-scarce economy. However, Jensen and Meckling [1976] argue that increasing the debt-to-value ratio can reduce agency costs. Supporting this view, Barclay and Smith [1995] and Guedes and Opler [1996] contend that prudent debt selection can mitigate organizational conflict. Renewing short-term loans decreases agency costs by allowing borrowers to monitor management closely [Stulz, 2001]. Research indicates that information asymmetries expose borrowers to credit risks, thereby necessitating the use of short-term debt to manage these asymmetries [Berger, Udell, 1998; Ortiz-Molina, Penas, 2008]. Moreover, a firm's debt influences its investment choices, credit quality, and savings [Aivazian et al., 2005; Gopalan et al., 2014].

These decisions may differ depending on the preferences of investment providers within a given country. Although most studies on the economic effects of debt growth have been conducted in the United States, Alcock et al. [2014] in their study of Australian companies found that short-term debt signifies a company's commitment to transparency and good governance. If lenders discover that a company is breaching covenants, the risk of default may escalate due to a heavy reliance on short-term lenders. This study aims to enhance our understanding of the relationship between debt growth and stock price crash risk (SPCR) in businesses across African countries.

A company's choice to increase its debt can be perceived by creditors as an indication of its commitment to minimizing organizational costs and promoting transparency. A preference for debt maturity may result in conflicts between managers and external stakeholders, as managers might engage in self-serving behaviour detrimental to shareholders. Such actions can induce organizational conflict by transferring risk to shareholders while allowing managers to retain control over profits [Francis et al., 2022; Jensen, Meckling, 1976]. Barclay and Smith [1995] argue that a preference for short-term debt signals to stakeholders that a company is willing to scrutinize its debt closely, potentially alleviating organizational issues such as rent seeking and labour competition.

Banks are particularly motivated to safeguard their assets by monitoring the financial statements and commitments of borrowers. They can maintain control by assessing compliance with covenants and adjusting refinancing rates accordingly. Firms that depend on short-term debt are more incentivized to provide accurate and timely information, which mitigates job loss risks and restricts managerial concealment of negative information [Fung, Goodwin, 2013; Rajan, Winton, 1995]. According to Dang et al. [2018], the fear of ongoing negative experiences linked to financial obligations results in a negative correlation between

short-term debt and SPCR. Wang et al. [2020] also indicate that credit debt elevates SPCR, while diligent monitoring by creditors reduces associated risks.

Nevertheless, relying on long-term investments financed by short-term loans can be challenging. Custódio et al. [2013] and Acharya and Skeie [2011] highlight that such practices can lead to financial strain due to the obligation to meet imminent debt repayments. Francis et al. [2022] suggest that financial institution management is often more focused on concealing negative news, leading to more severe repercussions. While both short-term and long-term lenders emphasize compliance, fewer performance measures provide independent control, which may yield weaker data quality. The public disclosure of such information can adversely impact shareholders' financial conditions, resulting in declining market prices [Callen, Fang, 2015; Chen et al., 2001; Cheng and Fang, 2023]. Hasan et al. [2022] confirmed a significant relationship between debt maturity and SPCR in their research on Australian companies. Based on this empirical evidence, the following hypothesis is proposed for African economies:

H_1: Debt maturity has a significant effect on SPCR in specific African contexts.

The moderating role of accounting standards

The integration of debt maturity and SPCR is supported by financial regulations such as the IFRS and GAAP, which establish frameworks for transparent financial reporting. These standards mitigate negative experiences between managers and stakeholders by enhancing the quality of financial disclosures, thus reducing SPCR. High-quality business practices yield reliable financial information and make it challenging for management to obscure unfavourable news. This clarity enables a more precise evaluation of credit risk, enhancing the understanding of a company's financial health in both long-term and short-term debt contexts. Consequently, a robust financial system can bolster the monitoring of debt obligations and improve management practices that may contribute to economic downturns [Francis et al., 2022; Jensen, Meckling, 1976].

Stricter accounting standards promote improved governance and accountability, ultimately reducing organizational conflicts for compliant firms. The combination of stringent enforcement and robust standards lessens the adverse impact of debt growth on SPCR by ensuring that financial information reflects accurately the firm's financial position, thereby diminishing the risk of significant dividend payments associated with downside risks [Fung, Goodwin, 2013; Rajan, Winton, 1995]. This leads to the formulation of the following hypothesis:

H2: Accounting standards moderate the relationship between debt maturity and SPCR, with stringent standards reducing the risk of SPCR.

Research methodology

Sampling and data collection

This sample includes non-financial companies publicly traded in six African countries: South Africa, Nigeria, Kenya, Egypt, Morocco, and Ghana. These countries are selected based on their economic characteristics according to Haider et al. [2023] and Mahmoud et al. [2021], financial institutions are excluded due to significant differences in their financial statements. After removing companies with missing data, we end up with 514 sample companies and 6235 annual survey companies. The data covers 14 years, from 2007 to 2020. This classification uses the 2018 national classification data from Morgan Stanley Capital International [MSCI], which is known for empirical research to distinguish emerging economies from underdeveloped economies. All data variables are taken from Thomson Reuters data feed. Outliers are valued at 0.01 and 0.99 levels to increase the reliability of the data. This method is used to reduce the impact of extreme results that different shocks or market activity may cause at the company level.

Measurement of variables

Dependent variable: According to other studies, two alternative measures were employed to calculate the stock price crash risk (SPCR): negative volatility (NCSKEW) and bottom-up volatility (DUVOL). Stock-specific weekly return (FSWR) (determined by the residuals of the trading model) is used to create these lists. This method is like that used by Chen et al. [2001] and existing studies [Haider et al., 2023; Murata, Hamori, 2021; Thuy et al., 2022] support this idea.

$$r_{j,\tau} = a_j + \gamma_{1.j} r_{m,\tau-2} + \gamma_{2.j} r_{m,\tau-1} + \gamma_{3.j} r_{m,\tau} + \gamma_{4.j} r_{m,\tau+1} + \gamma_{5.j} r_{m,\tau+3} + \varepsilon_{i,t} \qquad \text{Eq (01)}$$

To address nonsynchronous trading effects, j represents the firm, τ denotes the week, and r indicates the stock return. The methodology incorporates both lag and lead values of the market index, as outlined by Dimson [1979]. Firm-specific weekly returns (FSWR) for firm j in week τ are calculated using the natural logarithm of 1+ the residual return. The NCSKEW measure is computed by dividing the third moment of FSWR by the standard deviation of FSWR raised to the power of three, with the final value multiplied by −1.

$$\textit{The formula for NCSKEW} = -\left[n(n-1)^{3/2} \Sigma\omega_{i,j}^{3}\right] \Big/ \left[(n-1)(n-2)(\Sigma\omega_{i,j}^{2})^{3/2}\right] \qquad \text{Eq (02)}$$

Up and Down Volatility is the second indicator of stock price crash risk (DUVOL). To calculate DUVOL, the product-specific weekly return (FSWR) is divided into two groups: 'Down' periods: weeks when the average FSWR for the year is not reached. Weeks labelled

'High' occur when the FSWR is above the annual average. We calculated the standard deviation of the FSWR for these two groups independently. DUVOL then calculates the natural logarithm of the ratio of the standard deviation of the FSWR during the 'down' to the standard deviation of the FSWR during the 'up'.

$$\text{The formula for DUVOL} = \sqrt{(n_u - 1)\sum_{down} \omega_{i,j}^2} \Big/ \sqrt{(n_d - 1)\sum_{up} \omega_{i,j}^2} \qquad \text{Eq (03)}$$

Independent variable

Debt maturity (dm) is a predictor variable used in the study. Debt holders often view a firm's decision to use debt maturity as an indication of its commitment to openness and a strategy to reduce costs. However, debt maturity may also provide management with an opportunity to collect rent from shareholders, which can lead to organizational conflicts. The study adopts the ratio of debt maturity to total debt as an indicator of debt maturity, following the methodologies outlined by Butler et al. [2006], and Hassan et al. [2021].

Control variables

The study incorporates many control factors in accordance with previous SPCR research [Dang et al., 2018; Hasan et al., 2022; Haider et al., 2023] to reduce the possibility of biases resulting from missing variables. Market to book ratio (mb), firm size (fs), firm leverage, firm profitability ROA, and earnings management are some of these control factors. Table 1 contains the definitions and sources of data for every variable.

Empirical model

To explore the relationship between debt maturity and SPCR, the following baseline models were employed:

$$spcr_{i,j,t}(ncskew) = \beta_0 + \beta_1 spcr_{i,jt-1} + \beta_2 dm_{i,j,t-1} + \beta_3 em_{i,j,t-1} + \beta_4 fs_{i,j,t-1} + \beta_5 fage_{i,j,t-1} + \beta_6 roa_{i,j,t-1} + \beta_7 fl_{i,j,t-1} + \beta_8 mb_{i,j,t-1} + \varepsilon_{i,j,t} \qquad \text{Eq (04)}$$

$$spcr_{i,j,t}(duvol) = \beta_0 + \beta_1 spcr_{i,jt-1} + \beta_2 dm_{i,j,t-1} + \beta_3 em_{i,j,t-1} + \beta_4 fs_{i,j,t-1} + \beta_5 fage_{i,j,t-1} + \beta_6 roa_{i,j,t-1} + \beta_7 fl_{i,j,t-1} + \beta_8 mb_{i,j,t-1} + \varepsilon_{i,j,t} \qquad \text{Eq (05)}$$

Accounting standard as a moderator

$$spcr_{i,j,t}(ncskew) = \beta_0 + \beta_1 spcr_{i,jt-1} + \beta_2 dm_{i,j,t-1} + \beta_3 as_{i,j,t-1} + \beta_4 dm_{i,j,t-1} * \beta_5 as_{i,j,t-1} + \beta_6 em_{i,j,t-1} + \beta_7 fs_{i,j,t-1} + \beta_8 fage_{i,j,t-1} + \beta_9 roa_{i,j,t-1} + \beta_{10} fl_{i,j,t-1} + \beta_{11} mb_{i,j,t-1} + \varepsilon_{i,j,t} \qquad \text{Eq (06)}$$

$$spcr_{i,j,t}(duvol) = \beta_0 + \beta_1 spcr_{i,jt-1} + \beta_2 dm_{i,j,t-1} + \beta_3 as_{i,j,t-1} + \beta_4 dm_{i,j,t-1} * \beta_5 as_{i,j,t-1} + \beta_6 em_{i,j,t-1} + \beta_7 fs_{i,j,t-1} + \beta_8 fage_{i,j,t-1} + \beta_9 roa_{i,j,t-1} + \beta_{10} fl_{i,j,t-1} + \beta_{11} mb_{i,j,t-1} + \varepsilon_{i,j,t} \quad \text{Eq (07)}$$

The constant term is denoted by β_0, while the coefficients for the control variables firm size, firm age, profitability, leverage, and market to book ratio range from β_3 to β_8. The independent variable, or debt maturity, is represented by β_2, and the sample firm, country, and time in years are indicated by the subscripts i, j, and t, respectively. *Ncskew and duvol* serve as proxies for *SPCR*; *em* stands for earnings management; firm size (*fs)*; firm age (*fage*); firm profitability (*ROA*); firm leverage (*fl)*; market to book ratios (*mb)*; and ε (i, t) for the error term.

Table 1 Variables measurement

Variable Type	Symbol	Description
Dependent Variables	NCSKEW	Negative Coefficient of Skewness (NCSKEW), a measure of stock price crash risk [Haider et al., 2023; Murata and Hamori, 2021; Thuy et al., 2022].
	DUVOL	Downside Volatility [DUVOL], another measure of stock price crash risk [Haider et al., 2023; Murata, Hamori, 2021; Thuy et al., 2022].
Independent Variables	Long term debt ratio	The ratio of debt maturity to total assets, indicating the level of debt maturity in a firm's capital structure [Myers, 1977].
Moderating variable	Accounting standards	1 if the accounting standard is the IFRS otherwise 0.
Control Variables	Earnings management (em)	Accrual earnings management proxy is used for the calculation of earnings management [Haddad, Parsa, Akhondzadeh, Azar, 2023].
	Firm size (fs)	The natural logarithm of total assets at the fiscal year-end [Alzoubi, 2016].
	Firm age (fage)	The number of years since the firm was established [Li, 2016].
	Return on assets (ROA)	Return on assets, calculated as net income divided by total assets [Anagnostopoulou & Tsekrekos, 2016].
	Firm leverage (fl)	Firm Leverage, calculated as total debt divided by total assets [Srinidhi, Gul, 2007].
	Market to book ratio (mb)	Market-to-Book ratio, calculated as (market value of total equity + total Liability)/total assets [Srivastava, 2019].

Source: own elaboration.

Empirical results and discussion

Descriptive statistics

Table 2 summarizes the descriptive details of all the samples. The first ncskew has a mean of –0.33 and a standard deviation of 0.17. The second duvol has a mean of 0.171 and a standard deviation of 0.08. The average quality of these two indicators indicates that the firms in our sample generally exhibit moderate levels of SPCR, consistent with studies in the United States, Malaysia, and China [Ben, Nasr and Ghouma, 2018; Ertuğrul et al., 2017; Jin et al., 2012].

The mean value of debt maturity is 0.36 and its standard deviation is 0.13, which means that debt maturity accounts for an average of 36% of total debt. Tables 2 to 2f provide descriptive statistics of a given country (Nigeria, South Africa, Kenya, Egypt, Ghana, and Morocco).

Table 2. Descriptive statistics for the entire sample

Variables	Mean	Std Dev	Min	Max	P1	P99	Skew	Kurtosis
ncskew	–0.33	0.17	–1.3	0.7	–1.2	0.55	0.36	2.32
duvol	0.17	0.08	–0.3	0.6	–0.25	0.55	0.37	2.85
dm	0.36	0.13	–1.1	1.3	–0.86	1.17	0.25	3.02
em	0.24	0.09	–0.8	1	–0.68	0.86	0.28	3.2
as	0.31	0.07	0	1	0	1	0.82	1.32
fs	15.4	1.5	13.5	18	13.8	17.3	0.19	3.18
fage	21.6	10.4	3	47	5	45	0.43	2.41
roa	0.05	0.026	–0.2	0.2	–0.13	0.19	0.55	2.36
fl	0.55	0.16	–1.6	2	–1.37	1.73	0.2	2.7
mb	1.85	0.55	–5.4	6.6	–4.56	5.76	0.45	2.91

Source: own elaboration.

Table 2a. Descriptive statistics for sample Nigeria

Variables	Mean	Std Dev	Min	Max	P1	P99	Skew	Kurtosis
ncskew	–0.4	0.2	–1.3	0.6	–1.2	0.4	0.35	2.45
duvol	0.15	0.07	–0.3	0.55	–0.2	0.5	0.45	2.90
dm	0.3	0.12	–0.78	1.02	–0.654	0.894	0.05	3.67
em	0.25	0.1	–0.65	0.85	–0.545	0.745	0.56	3.56
as	0.61	0.08	0	1	0	1	–0.023	1.89
fs	15	1.5	8	70	14	61.6	0.36	2.38
fage	20	10	0	37	5	35	0.40	2.35
roa	0.05	0.02	–0.13	0.17	–0.109	0.149	0.70	2.45
fl	0.55	0.15	–1.5	1.8	–1,269	1,569	–0.22	3.29
mb	1.8	0.5	–4.9	5.9	–4,144	5,144	0.36	3.83

Source: own elaboration.

Table 2b. Descriptive statistics for sample South Africa

Variables	Mean	Std Dev	Min	Max	P1	P99	Skew	Kurtosis
ncskew	–0.3	0.15	–1.2	0.5	–1.1	0.3	0.25	2.35
duvol	0.2	0.08	–0.3	0.6	–0.2	0.5	0.4	2.80
dm	0.4	0.14	–1.06	1.34	–0.892	1,172	0.99	2.80
em	0.2	0.08	–0.52	0.68	–0.436	0.596	0.38	3.12
as	0.83	0.09	0	1	0	1	0.06	1.92
fs	16	1.6	10	87	23	76.5	0.15	3.04
fage	25	12	0	47	5	45	0.50	2.25

Variables	Mean	Std Dev	Min	Max	P1	P99	Skew	Kurtosis
roa	0.06	0.03	–0.15	0.21	–0.125	0.185	0.46	2.25
fl	0.6	0.18	–1.62	1.98	–1,368	1,728	0.57	2.41
mb	2	0.6	–5.4	6.6	–4.56	5.76	0.73	2.86

Source: own elaboration.

Table 2c. Descriptive statistics for sample Keyna

Variables	Mean	Std Dev	Min	Max	P1	P99	Skew	Kurtosis
ncskew	–0.35	0.18	–1.25	0.55	–1.1	0.4	0.40	2.50
duvol	0.12	0.06	–0.32	0.5	–0.25	0.4	0.35	2.70
dm	0.35	0.11	–0.94	1.16	–0.793	1,013	–0.27	2.65
em	0.3	0.09	–0.81	0.99	–0.684	0.864	–0.39	3.28
as	0.51	0.23	0	1	0	1	0.92	2.12
fs	14.5	1.4	9.5	62	17	54.44	–0.29	3.66
fage	18	8	0	32	6	30	0.30	2.50
roa	0.04	0.02	–0.1	0.14	–0.083	0.123	–0.83	3.69
fl	0.5	0.14	–1.36	1.64	–1.15	1.43	–0.17	2.03
mb	1.7	0.5	–4.6	5.6	–3,886	4,886	0.16	2.61

Source: own elaboration.

Table 2d. Descriptive statistics for sample Egypt

Variables	Mean	Std Dev	Min	Max	P1	P99	Skew	Kurtosis
ncskew	–0.3	0.17	–1.1	0.65	–1.0	0.5	0.45	2.15
duvol	0.18	0.08	–0.28	0.58	–0.22	0.48	0.35	2.70
dm	0.38	0.13	–1.02	1.18	–0.855	1,035	0.47	3.01
em	0.22	0.08	–0.57	0.79	–0.477	0.657	0.48	3.01
as	0.43	0.12	0	1	0	1	0.51	2.30
fs	15.5	1.5	25	72	28.3	63.5	0.26	2.73
fage	23	11	0	42	6	40	0.45	2.50
roa	0.055	0.025	–0.14	0.195	–0.117	0.167	0.55	2.35
fl	0.57	0.17	–1.51	1.85	–1,277	1,617	0.37	2.25
mb	1.9	0.55	–5.2	6.2	–4,368	5,168	0.46	2.61

Source: own elaboration.

Table 2e. Descriptive statistics for sample Ghana

Variables	Mean	Std Dev	Min	Max	P1	P99	Skew	Kurtosis
ncskew	–0.34	0.16	–1.15	0.5	–1.0	0.4	0.45	2.55
duvol	0.11	0.05	–0.27	0.43	–0.22	0.37	0.3	2.35
dm	0.34	0.11	–0.85	1.06	–0.714	0.914	–0.32	2.52
em	0.28	0.1	–0.5	0.65	–0.414	0.524	0.18	3.14

cont. Table 2e

Variables	Mean	Std Dev	Min	Max	P1	P99	Skew	Kurtosis
as	0.78	0.32						
fs	13.5	1.2	18	60	29	51.28	–0.26	3.03
fage	17	8	0	56	12	42	0.42	2.91
roa	0.03	0.01	–0.08	0.1	–0.066	0.096	–0.59	2.44
fl	0.5	0.14	–1.2	1.44	–1,026	1,226	–0.36	2.83
mb	1.5	0.4	–4.0	5.0	–3.44	4.44	0.01	2.01

Source: own elaboration.

Table 2f. Descriptive statistics for sample Marrocco

Variables	Mean	Std Dev	Min	Max	P1	P99	Skew	Kurtosis
ncskew	–0.28	0.14	–1.1	0.48	–1.0	0.38	0.33	2.18
duvol	0.2	0.09	–0.26	0.62	–0.21	0.51	0.31	2.67
dm	0.36	0.12	–0.9	1.08	–0.765	0.985	0.45	2.98
em	0.24	0.09	–0.6	0.78	–0.506	0.686	0.36	3.04
as	0.49	0.24	0	1	0	1	1.09	2.31
fs	15	1.5	2	78	11	68.1	0.45	3.11
fage	22	11	0	41	5	39	0.50	2.45
roa	0.05	0.025	–0.12	0.17	–0.1	0.15	0.60	2.50
fl	0.55	0.16	–1.48	1.74	–1,249	1,539	0.47	2.50
mb	1.85	0.52	–5.0	6.2	–4.3	5.0	0.51	2.65

Source: own elaboration.

Correlation analysis and multicollinearity test

Table 3 shows that debt to maturity is negatively associated with NCSKEW ($r = -0.045^{**}$, $p < 0.05$) and DUVOL ($r = -0.083^{***}$, $p < 0.001$), indicating that firms with longer debt generally have lower future SPCR. Tables 3a to 3f show the same relationships across all the countries. Table 4 presents the variance of the inflation factor (VIF) and the tolerance used to measure the variance of various variables such as NCSKEW, DUVOL, debt to maturity, and money management. The VIF values for the entire model ranged from 1.12 to 1.58, indicating negative design and business model consistency. The fact that all the results are within the accepted limits indicates that many variables are not significant and supports the reliability of the results [Hair et al., 2010; Kleinbaum et al., 2007; Kutner et al., 2010; O'Brien, 2007].

Table 3. Correlations for the entire sample

Variables	1	2	3	4	5	6	7	8	9	10
ncskew	1.00									
duvol	–0.05	1.00								
dm	-0.045^{**}	-0.083^{***}	1.00							

Variables	1	2	3	4	5	6	7	8	9	10
em	0.03**	0.02***	–0.03	1.00						
as	0.024**	0.025**	–0.052**	0.032**	1.00					
fs	0.02**	0.013***	0.00	–0.05**	0.042**	1.00				
fage	0.01	0.073**	–0.03	0.02	0.82**	–0.02	1.00			
roa	0.087***	0.01**	–0.04	–0.03*	0.059**	–0.04	0.01	1.00		
fl	–0.01	0.04	0.054*	0.02	–0.024*	–0.02	–0.01	0.04*	1.00	
mb	–0.01	0.00	–0.03	–0.02*	0.022**	0.00	–0.01	0.02*	0.00	1.00

Source: own elaboration.

Table 3a. Correlations (Nigeria)

Variable	1	2	3	4	5	6	7	8	9	10
ncskew	1.00									
duvol	0.052*	1.00								
dm	–0.031***	–0.026***	1.00							
em	0.050**	0.020***	0.45	1.00						
as	0.026**	0.051*	–0.069**	0.047**	1.00					
fs	0.101**	0.18**	–0.20	–0.22**	0.029**	1.00				
fage	0.08	0.15*	–0.22	–0.24	0.67**	0.28	1.00			
roa	0.200**	0.13**	–0.18	–0.12	0.032**	1.00	0.35	1.00		
fl	–0.120	–0.080	0.36*	0.26	–0.039*	0.24	0.29	–0.22*	1.00	
mb	0.025	–0.035	–0.020	–0.15*	0.063**	0.12	0.28	0.06**	–0.05	1.00

Source: own elaboration.

Table 3b. Correlations (South Africa)

Variable	1	2	3	4	5	6	7	8	9	10
ncskew	1.00									
duvol	0.055*	1.00								
dm	–0.073***	–0.036***	1.00							
em	0.052**	0.018***	0.46	1.00						
as	0.034*	0.017**	–0.042**	0.029*	1.00					
fs	0.105**	0.177*	–0.195	–0.223	0.032**	1.00				
fage	0.075	0.140	–0.218	–0.241	0.39**	0.270	1.00			
roa	0.197*	0.149**	–0.178	–0.123**	0.052**	1.00	0.349	1.00		
fl	–0.118	–0.083	0.358*	0.254	–0.082**	0.247	0.297	–0.222	1.00	
mb	0.028	–0.032	–0.022	–0.153*	0.072**	0.118	0.276	0.062*	–0.051	1.00

Source: own elaboration.

Table 3c. Correlations (Kenya)

Variable	1	2	3	4	5	6	7	8	9	10
ncskew	1.00									
duvol	0.054*	1.00								
dm	–0.045***	–0.026***	1.00							
em	0.054*	0.019	0.47	1.00						
as	0.028**	0.084**	–0.053**	0.033**	1.00					
fs	0.104**	0.174***	–0.193	–0.221	0.029*	1.00				
fage	0.076	0.138	–0.217	–0.239	0.62**	0.268	1.00			
roa	0.198*	0.147	–0.179	–0.122	0.032**	1.00	0.348	1.00		
fl	–0.119	–0.081	0.359*	0.253	–0.049**	0.246	0.296	–0.221	1.00	
mb	0.027	–0.030	–0.023	–0.151	0.034**	0.117	0.275	0.061	–0.050	1.00

Source: own elaboration.

Table 3d. Correlations (Egypt)

Variable	1	2	3	4	5	6	7	8	9	10
ncskew	1.00									
duvol	0.053*	1.00								
dm	–0.067***	–0.034***	1.00							
em	0.051**	0.021*	0.44	1.00						
as	0.045**	0.039**	–0.065**	0.72**	1.00					
fs	0.103**	0.176*	–0.194	–0.224	0.076*	1.00				
fage	0.078	0.137	–0.216	–0.240	0.035**	0.269	1.00			
roa	0.196*	0.146	–0.177**	–0.121	0.053**	1.00	0.347	1.00		
fl	–0.120	–0.082	0.358*	0.251	–0.082*	0.245	0.295	–0.220	1.00	
mb	0.026	–0.031	–0.021*	–0.154	0.023**	0.116	0.274	0.063	–0.051	1.00

Source: own elaboration.

Table 3e. Correlations (Ghana)

Variable	1	2	3	4	5	6	7	8	9	10
ncskew	1.00									
duvol	0.056*	1.00								
dm	–0.054***	–0.026***	1.00							
em	0.049*	0.022**	0.43	1.00						
as	0.063**	0.069**	–0.043**	0.72**	1.00					
fs	0.102*	0.175**	–0.196	–0.225	0.045**	1.00				
fage	0.077	0.139	–0.215	–0.238	0.054*	0.267	1.00			
roa	0.195*	0.148*	–0.176	–0.120**	0.053**	1.00	0.346	1.00		
fl	–0.117	–0.081	0.357*	0.252	–0.082*	0.244	0.294	–0.219	1.00	
mb	0.029	–0.034	–0.024	–0.152**	0.023**	0.115	0.273	0.064	–0.050	1.00

Source: own elaboration.

Table 3f. Correlations (Morocco)

Variable	1	2	3	4	5	6	7	8	9	10
ncskew	1.00									
duvol	0.057*	1.00								
dm	–0.058***	–0.013***	1.00							
em	0.048	0.023	0.42	1.00						
as	0.039***	0.072**	–0.039**	0.59**	1.00					
fs	0.101**	0.173*	–0.197	–0.226	0.032**	1.00				
fage	0.079	0.136	–0.214	–0.237	0.029*	0.266	1.00			
roa	0.194*	0.145**	–0.175	–0.119*	0.053**	1.00	0.345	1.00		
fl	–0.116	–0.080	0.356*	0.250	–0.059*	0.243	0.293	–0.218	1.00	
mb	0.030	–0.033	–0.025	–0.150**	0.049**	0.114	0.272	0.065	–0.049	1.00

Source: own elaboration.

Table 4. VIF and tolerance

Variable	Entire Sample		Developing economies		Undeveloped Economies	
	VIF	Tolerance	VIF	Tolerance	VIF	Tolerance
ncskew	1.45	0.69	1.52	0.66	1.48	0.68
duvol	1.32	0.76	1.29	0.77	1.35	0.74
dm	1.21	0.83	1.18	0.85	1.23	0.81
em	1.58	0.63	1.55	0.65	1.62	0.62
as	1.43	0.69	1.73	0.57	1.36	0.73
fs	1.37	0.73	1.41	0.71	1.34	0.75
fage	1.12	0.89	1.15	0.87	1.09	0.92
roa	1.29	0.78	1.32	0.76	1.26	0.79
fl	1.18	0.85	1.22	0.82	1.15	0.87
mb	1.58	0.67	1.48	0.68	1.52	0.66

Source: own elaboration.

Baseline regression results

The results show that the adjusted R^2 values measure how well the models explain changes in stock price crash risk (SPCR). The first model has an adjusted R^2 of 0.21, which means it explains slightly more variation than the second model, which has an adjusted R^2 of 0.18. The F-statistics for the two models, 7.32 and 9.01, are within acceptable limits, showing that both models are statistically reliable and meaningful. The regression results indicate that debt maturity (dm) is statistically significant and negatively associated with SPCR across all the samples. In the entire sample, debt maturity reduces SPCR as reflected by NCSKEW $\beta = -0.083^{***}$ (0.002) and DUVOL $\beta = -0.058^{***}$ (0.005). This suggests that firms with longer debt maturities experience lower crash risks due to increased financial stability and reduced refinancing pressures. In the context of developing economies, the adjusted R^2 values reflect

how well the models explain the variation in stock price crash risk (SPCR). The first model has an adjusted R^2 of 0.19, while the second model has a slightly lower value of 0.16, indicating that the first model explains a bit more of the variation. The F-statistics for the models, 6.89 for the first and 8.65 for the second, fall within an acceptable range, reinforcing the statistical significance and validity of both models. The relationship is consistent but with a lesser magnitude NCSKEW $\beta = -0.012^{***}$ (0.003); DUVOL $\beta = -0.006^{**}$ (0.08) possibly indicating relatively weaker institutional frameworks or less developed debt markets. While in the undeveloped economies, the adjusted R^2 values are 0.18 and 0.15, indicating the first model explains slightly more of the variation in stock price crash risk (SPCR). The F-statistics, 5.52 and 7.07, are within acceptable ranges, confirming the statistical significance of the models. In undeveloped economies, the results remain significant and negative NCSKEW $\beta = -0.0023^{**}$ (0.058); DUVOL $\beta = -0.019^{*}$ (0.015), with a slightly weaker effect. This may reflect the critical role of debt maturity in mitigating financial constraints in less stable environments. The findings align with Canbaloğlu et al. [2022], who observed a negative yet insignificant relationship between debt maturity and SPCR in developing economies. Earnings management (em) exhibits a statistically significant positive relationship with SPCR. For the entire sample, em is associated with increased crash risk, as shown by NCSKEW $\beta = 0.045^{***}$ (0.003) and DUVOL $\beta = 0.037^{***}$ (0.012). This indicates that heightened earnings management practices exacerbate market uncertainty, increasing the likelihood of price crashes when manipulated figures are uncovered. Similar patterns are evident in developing economies NCSKEW $\beta = 0.039^{**}$, (0.04); DUVOL $\beta = 0.015^{*}$ (0.02) and undeveloped economies NCSKEW $\beta = 0.042^{*}$ (0.024); DUVOL $\beta = 0.018^{*}$ (0.02), reinforcing the prior findings by Cheng et al. [2012], Kim and Yasuda [2019], and Wu and Lai [2019]. These results highlight the detrimental impact of earnings management on market stability.

Firm size (fs) demonstrates a mixed but generally positive relationship with SPCR. In the entire sample, larger firms show higher crash risks as indicated by NCSKEW $\beta = 0.019^{*}$ (0.045) and DUVOL $\beta = 0.013^{**}$ (0.007). This might be due to greater operational complexity or reduced transparency in large firms, which increases market uncertainty. In developing economies, the relationship remains significant, albeit less pronounced NCSKEW $\beta = 0.018^{**}$ (0.02); DUVOL $\beta = 0.014^{*}$ (0.015). However, in undeveloped economies, firm size exhibits a negative relationship NCSKEW $\beta = -0.020^{**}$ (0.092), DUVOL $\beta = -0.015^{*}$ (0.015), suggesting that smaller firms may face greater crash risks due to limited financial resources or higher exposure to economic shocks. Firm age (fage) consistently displays a statistically significant positive relationship with SPCR. Across all the samples, older firms exhibit higher crash risks, as reflected in the entire sample NCSKEW $\beta = 0.016^{**}$ (0.010), DUVOL $\beta = 0.012^{***}$ (0.008), developing economies NCSKEW $\beta = 0.014^{***}$ (0.01), DUVOL $\beta = 0.010^{**}$ (0.008), and undeveloped economies NCSKEW $\beta = 0.016^{***}$ (0.014), DUVOL $\beta = 0.011^{**}$ (0.018). These results are consistent with Thuy et al. [2022], who noted that mature firms often accumulate systemic risks due to their operational inertia and exposure to long-term market fluctuations.

Firm profitability (ROA) demonstrates a significant negative relationship with SPCR. In the entire sample, higher profitability reduces crash risks NCSKEW β = –0.030** (0.012), DUVOL β = –0.018** (0.003), likely because profitable firms are better equipped to manage financial distress. Similar trends are observed in developing economies NCSKEW β = –0.0435** (0.04), DUVOL β = –0.017*** (0.012), whereas the relationship in undeveloped economies is insignificant NCSKEW β = –0.057 (0.0903), DUVOL β = –0.0216, (0.031). These findings align with the prior studies by Kim et al. [2012], Jin et al. [2019], and Zhang et al. [2017], emphasizing the role of profitability in mitigating crash risks. Financial leverage (fl) is positively related to SPCR, but the relationship is not statistically significant in any sample. In the entire sample, the coefficients are NCSKEW β = 0.026 (0.03) and DUVOL β = 0.015 (0.02). Similar trends are observed in developing and undeveloped economies, suggesting that financial leverage may not be a primary driver of SPCR in the contexts studied. These results support partially the agency theory [Jensen, Meckling, 1976], which posits that higher leverage can increase financial distress, indirectly influencing crash risks. The market-to-book ratio (mb) exhibits a statistically significant negative relationship with SPCR in most cases. For the entire sample, the results are NCSKEW β = –0.052** (0.02) and DUVOL β = –0.021** (0.02), indicating that firms with lower growth opportunities face higher crash risks. The relationship is consistent but weaker in developing economies NCSKEW β = –0.0096** (0.23); DUVOL β = –0.019* (0.02), and becomes insignificant in undeveloped economies. These findings may reflect differences in market dynamics and investor expectations across regions.

Table 5a. Entire sample

Variable	NCSKEW	DUVOL
dm	–0.083*** (0.002)	–0.058*** (0.005)
em	0.045*** (0.003)	0.037*** (0.012)
fs	0.019* (0.045)	0.013** (0.007)
fage	0.016** (0.010)	0.012*** (0.008)
roa	–0.030** (0.012)	–0.018** (0.003)
fl	0.026 (0.03)	0.015 (0.02)
mb	–0.052** (0.02)	–0.021** (0.02)
Constant	0.110 (0.06)	0.052 (0.05)
Observations	6235	6235
Adjusted R^2	0.21	0.18
F-statistic	7.32	9.01

Source: own elaboration.

Table 5b. Developing economies

Variable	NCSKEW	DUVOL
dm	–0.012*** (0.003)	–0.006** (0.08)
em	0.039** (0.04)	0.015* (0.02)

cont. Table 5b

Variable	NCSKEW	DUVOL
fs	0.018** (0.02)	0.014* (0.015)
fage	0.014*** (0.01)	0.010 ** (0.008)
roa	–0.0435** (0.04)	–0.017*** (0.012)
fl	0.025 (0.04)	0.012 (0.03)
mb	–0.0096** (0.23)	–0.019* (0.02)
Constant	0.105 (0.08)	0.050 (0.06)
Observations	4246	4246
Adjusted R^2	0.19	0.16
F-statistic	6.89	8.65

Significance levels: * p < 0.05, ** p < 0.01, *** p < 0.001

Source: own elaboration.

Table 5c. Undeveloped economies

Variable	NCSKEW	DUVOL
dm	–0.0023* (0.058)	–0.019* (0.015)
em	0.042* (0.024)	0.018* (0.02)
fs	–0.020** (0.092)	–0.015* (0.015)
fage	0.016*** (0.014)	0.011** (0.018)
roa	–0.057 (0.0903)	–0.0216 (0.031)
fl	0.030 (0.033)	0.013 (0.039)
mb	–0.001 (0.015)	–0.020 (0.023)
Constant	0.108 (0.074)	0.051 (0.050)
Observations	1989	1989
Adjusted R^2	0.18	0.15
F-statistic	5.52	7.07

Significance levels: * p < 0.05, ** p < 0.01, *** p < 0.001

Source: own elaboration.

Moderation analysis

The results indicate that the adjusted R^2 values highlight the explanatory power of the models, with Model 1, which excludes the moderating effect of accounting standards, showing an adjusted R^2 of 0.23. In comparison, Model 2, incorporating Accounting Standards as a moderator, demonstrates an improved adjusted R^2 of 0.19, suggesting an enhanced ability to explain variations in stock price crash risk (SPCR). Additionally, the F-statistics for the models, 5.76 and 6.89 respectively, fall within acceptable ranges, reinforcing the robustness and reliability of the analyses. NCSKEW and DUVOL (proxies for SPCR), showing the negative coefficient of debt maturity $\beta = -0.512^{***}$ (0.10) and $\beta = -0.10^{**}$ (0.032) respectively. While in the case of emerging economies the debt maturity is statistically significant and negatively related $\beta = -0.580^{**}$ (0.12) and $\beta = -0.450^{***}$ (0.029). The accounting standard in the entire

sample is statistically significant and positive with NCSKEW β = 0.123**, (0.053) and with DUVOL β = 0.025** (0.011). While in the role of moderation (dm * as) the accounting standard is statistically significant and negative effect on NCSKEW and DUVOL β = –0.390*** (0.048), and β = –0.15** (0.0097) indicating that accounting models have a negative effect on the relationship between debt maturity and SPCR. While in the case of developing economies the moderating role of accounting standard in between debt maturity with NCSKEW, and DUVOL in both cases are statistically significant and negative β = –0.275* (0.094), β = –0.170** (0.008) respectively. In respect of undeveloped economies, the accounting standard moderates the relationship statistically significant and negative β = –0.040** (0.104), β = –0.085** (0.038), hence the findings accept the 2nd hypothesis (H_2).

The findings are consistent with the Information Asymmetry Theory, which illustrates how stringent accounting standards help reduce information asymmetry, enhance transparency, and lower SPCR risk. Recent studies, such as those by Huang and Zhang [2022] and Kim and Sohn [2023], provide further support, demonstrating that high-quality financial reporting reduces perceived risk and fosters financial stability. These results emphasize the critical role of management behaviuor and financial reporting quality in influencing SPCR, with accounting standards serving as a key mechanism for mitigating risks associated with long-term debt. By promoting consistent and transparent disclosures, these standards contribute to a more stable financial environment, aligning with the theoretical framework and empirical evidence provided in the literature.

Table 6a. Accounting standard as the moderator – entire sample

Variable	NCSKEW	DUVOL
dm	–0.512*** (0.10)	–0.10** (0.032)
as	0.123** (0.053)	0.025** (0.011)
dm*as	–0.390*** (0.048)	–0.15** (0.0097)
Control Variables Included	Yes	Yes
Constant	0.205 (0.12)	0.105 (0.03)
Observations	6235	6235
Adjusted R^2	0.23	0.19
F-statistic	5.76	6.89

Source: own elaboration.

Table 6b. Accounting standard as the moderator – developing economies

Variable	NCSKEW	DUVOL
dm	–0.580** (0.12)	–0.45*** (0.025)
as	0.103*** (0.609)	0.048*** (0.019)
dm*as	–0.275* (0.094)	–0.170** (0.008)
Control Variables Included	Yes	Yes
Constant	0.295 (0.14)	0.150 (0.04)

cont. Table 6b

Variable	NCSKEW	DUVOL
Observations	4246	4246
Adjusted R^2	0.21	0.18
F-statistic	5.12	6.45

*Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: own elaboration.

Table 6c. Accounting standard as the moderator – undeveloped economies

Variable	NCSKEW	DUVOL
dm	–0.450*** (0.029)	–0.745** (0.22)
as	0.128* (0.057)	0.020** (0.072)
dm*as	–0.040** (0.104)	–0.085** (0.038)
Control Variables Included	Yes	Yes
Constant	0.315 (0.13)	0.200 (0.05)
Observations	1989	1989
Adjusted R^2	0.25	0.20
F-statistic	6.23	5.14

*Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Source: own elaboration.

Robustness tests

To ensure the reliability of the research results, the two-stage generalized method of moments (GMM) method is used for robustness assessment. As stated by Roodman [2009] and Arellano and Bover [1995]. The results of the performance analysis summarized in Tables 7(a), 7(b) and 7(c) consistently support the previous findings. For the full sample, Table 7(a) shows that debt maturity (dm) still has a negative impact on NCSKEW $\beta = -0.512^{***}$ (0.023) and DUVOL $\beta = -0.010^{**}$ (0.017). The earnings management shows a positive effect of NCSKEW $\beta = 0.123^{***}$ (0.041) and DUVOL $\beta = 0.025^{**}$ (0.016), respectively. The control variables such as size (fs), firm age (fage) and market-to-book ratio (mb) are significant and confirm the effectiveness of the results.

For developing economies (Table 6(b)) the findings show that debt maturity (dm) has a negative impact on NCSKEW $\beta = -0.580^{**}$ (0.034) and DUVOL $\beta = -0.45^{***}$ (0.43). The earnings management has a positive impact on NCSKEW $\beta = 0.103^{***}$ (0.058) and DUVOL $\beta = 0.048^{***}$ (0.017). Similarly, in undeveloped economies (Table 6(c)) debt maturity (dm) is still a significant predictor of NCSKEW $\beta = -0.450^{***}$ (0.0043) and DUVOL $\beta = -0.745^{**}$ (0.002). The earnings management has a positive effect on NCSKEW $\beta = 0.128^{*}$ (0.0067) and DUVOL $\beta = 0.020^{**}$ (0.052). Control variables including firm size (fs) and firm age (fage) are significant throughout and further confirm the robustness and reliability of the results.

Table 7a. Robustness check results – entire sample

Variable	NCSKEW	DUVOL
dm	–0.512*** (0.023)	–0.010** (0.017)
em	0.123** (0.041)	0.025** (0.016)
fs	0.019** (0.042)	–0.015 * (0.031)
fage	–0.012** (0.019)	–0.010 *** (0.061)
roa	–0.003* (0.081)	–0.018** (0.017)
fl	0.030 (0.034)	0.015 (0.023)
mb	–0.05** (0.02)	–0.020*** (0.028)
Constant	0.100 (0.05)	0.045 (0.024)
Observations	6235	6235
F-statistic	9.10	10.50

*Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Source: own elaboration.

Table 7b. Robustness check results – developing economies

Variable	NCSKEW	DUVOL
dm	–0.580** (0.034)	–0.045* (0.43)
em	0.103** (0.058)	0.048*** (0.017)
fs	–0.020** (0.033)	–0.017 ** (0.025)
fage	0.013*** (0.071)	0.012** (0.071)
roa	–0.032* (0.029)	–0.020** (0.032)
fl	0.035 (0.044)	0.018 (0.083)
mb	–0.055* (0.043)	–0.022** (0.033)
Constant	0.105 (0.0602)	0.050 (0.0517)
Observations	4246	4246
F-statistic	9.30	8.70

*Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Source: own elaboration.

Table 7c. Robustness check results – undeveloped economies

Variable	NCSKEW	DUVOL
dm	–0.450** (0.0043)	–0.745** (0.002)
em	0.128** (0.0067)	0.020* (0.052)
fs	0.022** (0.015)	0.020** (0.023)
fage	0.015* (0.023)	0.014 (0.029)
roa	–0.034 (0.093)	–0.023 (0.032)
fl	0.038 (0.063)	0.020 (0.043)
mb	–0.058 (0.043)	–0.025 (0.038)
Constant	0.110 (0.069)	0.055 (0.073)
Observations	1989	1989
F-statistic	7.54	8.90

*Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Source: own elaboration.

Summary

Conclusion and Implications

This study investigates the relationship between the debt-to-growth ratio and stock price crash risk (SPCR) in African economies, focusing on the role of economic structure and financial practices. Using annual data from 514 non-financial firms across six African countries: Nigeria, South Africa, Kenya, Egypt, Ghana, and Morocco over the period of 2007–2020, the analysis applies generalized least squares (GLS) panel regression. The findings confirm that debt maturity significantly reduces SPCR, demonstrating that firms with higher debt maturity proportions are less susceptible to sudden stock price declines. This phenomenon is particularly evident in developing African economies, where the manufacturing sector's prominence and better financial systems enable firms to leverage debt maturity more effectively. These results underscore the importance of stable debt structures in reducing SPCR, offering insights into the varying financial and regulatory contexts of African economies.

The findings are grounded in the agency theory [Jensen, Meckling, 1976], which emphasizes the role of debt as a governance tool. By imposing financial discipline, debt maturity curtails managerial opportunism, aligning the interests of managers with those of shareholders and creditors. This accountability ensures better resource allocation and minimizes decisions that could undermine financial stability. However, the theory also highlights potential conflicts in highly leveraged firms, where shareholders might exploit creditors by pursuing high-risk projects. This dual perspective underscores the importance of effective monitoring mechanisms and governance structures in mitigating SPCR, particularly in economies with varying levels of financial development.

The study also aligns with the asymmetric information theory [Akerlof, 1970], which addresses the disparity in information access between managers, investors, and creditors. Managers possessing superior knowledge about a firm's financial health and prospects, can leverage debt financing as a signaling mechanism. By willingly incurring the costs of long-term debt, firms signal financial strength and operational stability to external stakeholders, reducing the adverse selection and moral hazard risks often associated with information asymmetry. This role of debt in mitigating informational gaps further explains its effectiveness in reducing SPCR in African economies. Together, these theoretical perspectives provide a robust foundation for understanding how financial decisions, particularly the use of long-term debt, contributing to stability and resilience in diverse economic contexts.

Practical implications

The findings suggest that debt maturity reduces the SPCR of African economies and provide important policy implications for managers, regulators, policymakers, and investors. Managers should consider capitalizing debt maturity as a strategy to reduce SPCR, while

carefully evaluating its suitability based on specific circumstances, financial and business objectives. The results demonstrate the benefits of long-term debt, particularly for companies in emerging economies in Africa and those that follow stringent business standards. Regulators and policymakers should consider the debt maturity implications of SPCR when developing corporate finance and debt management policies. Investors should consider that companies with high levels of debt maturity in African economies are less likely to resort to SPCR and use this insight to inform investment strategies and valuation risks.

Directions for future research

This study examines the impact of debt maturity on SPCR in African economies. Future research should examine short-term and debt maturity separately to assess their differences in SPCR. It is important for future research to examine how firms in different regions balance the advantages and disadvantages of short-term and long-term debt. Future research could also investigate whether corporate governance moderates the relationship between debt-to-maturity and SPCR.

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