The Influence of Brand Capital, Earnings Smoothing, And Stock Liquidity on Stock Price Crash Risk: Insights from Pakistan

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Abstract

The Pakistan Stock Exchange (PSX) appears to be highly vulnerable to market volatility and Stock Price Crash Risks. Therefore, it aims to explore significant causes of sudden and unexpectedly profound falls in the PSX stock price. The study draws upon 66 companies and panel data with 660 observations to investigate the relationships explored through the GLS model to determine the first-order panel stochastic legislation toward stationarity. The investigation targets important financial variables along with Negative Conditional Return Skewness (NCSKEW) and Downside Volatility (DUVOL), which impressionist the stock price crash risk. Consequently, the study establishes that earnings smoothing and brand capital play a part in moderating the positive effect on stock price crash risk; however, stock liquidity is inverse. Other predictors of crash risk are the firm's size, its return on assets, the level of its leverage, and the ratio of market-to-book values. Such findings are helpful in several actors in a nation's economy, especially in emerging markets such as Pakistan, including business leaders, investors, and policymakers, to manage risks accordingly. The study also suggests future research examining industry and macroeconomic factors to identify stocks with high-risk crashes in emerging markets.

Keywords: **Brand, Capital, Earnings Smoothing, Stock Liquidity, Stock Price Crash Risk**

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1. Introduction

Crash Risk forms part of the theoretical framework required to explain movements in stock markets, especially when stock prices fail to meet investors' expectations. This factor is usually made worse by attempts by the management to hide unfavorable information (Jin & Myers, 2006). This secrecy, when uncovered, usually triggers severe market responses that always result in major markdowns of equities. This is because other financial markets, which are highly sensitive to information, respond quickly and violently, especially when the bad information that has been hidden reaches the investors. Such an immediate response depicts the importance of tackling openness, prompt communication, and information balance throughout the market. These factors, in combination, form what is called Crash Risk.

As for the concept of Stock Price Crash Risk, one has to state that it goes far beyond the reaction to markets only; on the contrary, it is based upon the portfolio theory and the models of asset pricing, provided that investors' perceptions of the risks affect their decisions. For example, Kim and Zhang (2016) substantiate that although portfolio theory admits diversification, this does not decrease the probability of a fall in stock prices. Besides, Sunder (2010) explains that while investors' portfolios get diversified, he or she prefer investments with lower skewness as they find high skewness has a risk of crashing. Thus, the focus on lower skewness demonstrates the need to examine the dynamics of Crash Risk further.

Corporate insiders are pushing for riskier and riskier projects due to the conflict of interest between management and outsiders, which fuels the possibility of stock price crashes. Market failure results from this imbalance where insiders like corporate managers hold material non-public information that is unavailable to other investors in the general public (Sunder, 2010). Growing information asymmetry can lead to a dramatic drop in the prices of a company's stocks should adverse information be disclosed to the public. Kothari et al. (2009) also stress that Crash Risk is much higher when negative information is disclosed and many investors decide to sell their stocks, thus provoking a sharp decrease in the prices.

Crash Risk is seen to be negatively influenced and rectified by Brand Capital. Information brand capital useful to the investors on American firms and their products is a vital element that assists in shaping investors' perception and confidence (Larkin, 2013). However, understanding brand capital is not limited to brand image within the market; it is an essential component of strategic initiatives of expanding market share, increasing investors' value, and enhancing the shareholders' interests. Previous studies have examined the association between brand capital, competition, financial performance, and growth in detail (Aaker, 1996; Belo et al., 2021; Pillai, 2012). These studies demonstrate the significance of brand capital in assessing the company's financial results and its function as a shield against the influence of negative information on the market reputation.

The next key factor that affects Crash Risk is the Agency Problem. This issue emerges when some of the stakeholders in a business have contradictory interests, such as investors and managers. Habib et al. (2018) opine that managers omit negative data, hoping that it can be misleading about the stock market's trajectory. This behavior, however, subjects the company to a potential crash when the information is one day made public. Besides, brand capital can help address the agency problem due to increased transparency and investor confidence, making it difficult for a crash to happen (Kim, 2019).

As seen from the above discussion, Negative Skewness is a concept that is nearly allied to Crash Risk. Negative skewness for the returns for the assets means that the distribution has a longer tail to the left side, which implies that the possibility of extreme negative returns is lower. These rejected hypotheses imply that although the negative return frequency is significantly low, it dramatically impacts the asset when it occurs (Kim, 2019). This risk is a big menace to the market players and can lead to very high losses and price fluctuations. Negative skewness in a company's return distribution suggests reasons that can lead to a collapse in the stock price.

Earnings Smoothing is another factor that has been frequently researched in relation to crash risk. Earnings smoothing illustrates the act of adjusting the company's earnings to provide a financially consistent status for two different periods of time. While this practice enhances the measurable quality of returns and decreases the perceived risk, at the same time, this can hide the true state of a company (Dechow et al., 2010). As a result, investors are lulled into complacency due to the very fact that they are in possession of blue-chip stocks and do not follow the real situation of the company's financial situation, which will make them much more susceptible to market shocks when they occur. From the research conducted by Tucker and Zarowin (2006), they combine that the effects of earnings smoothing have some merits as it improves the forecast of returns but embeds some demerits as it has the propensity to increase the risk of stock price volatility.

Earnings Smoothing and Crash Risk have been established by different researchers with varying findings. Chen et al., (2012) opine that earnings smoothing can sometimes lower the risk of a stock price collapse since the firm's earnings look less volatile (Chen et al., 2012). However, others have suggested in this debate that the use of managed earnings elevates risk since it merely conceals any financial issues that companies may be facing, and thus when the negativity is revealed, the markets suffer more significant declines (Levitt, 1998). Considering this, the nature of this relationship calls for an investigation of how earnings management practices impact investor actions and market features.

Another index is Stock Liquidity, which also has an impact on Crash Risk. Market liquidity, on the other hand, means the ability of an asset, such as a stock, to be sold on the market without causing a large movement in the price of the same asset. High liquidity usually positively influences low transaction costs and increased market efficiency (Holden et al., 2014). In the case of Crash Risk, the current study also finds corroborative evidence to theories that stock

liquidity can both as well as positively impact Crash Risk. On the one hand, intense liquidity can increase the efficiency of the market by increasing transparency and decreasing the probability of a rapid decline in the price, as information is very quickly passed through the market (Alp et al., 2022). On the other hand, large liquidity measures may cause large fluctuations in relative prices and snap speculative movements, especially when there is bad news (Holmstrom & Tirole, 1993).

Much research has been done on the relationship between Stock Liquidity and Crash Risk, with a priority on emerging economies. For instance, Alp et al. (2022) worked on the effect of stock liquidity on crash risk in Istanbul, an important emerging market. According to their study, their results imply that while a higher level of liquidity works to mitigate the possibility of a market crash through increasing transparency, it increases risk through the speedy transmission of bad news. In the same way, Chauhan et al. (2017) raised a test on the link between stock liquidity and crash risk in Indian markets. They figured out that the restriction of negative information and the governance structures worked significantly in managing the risk.

However, to the best of the author's knowledge, no prior empirical studies examine the interaction between Brand Capital, Earnings Smoothing, Stock Liquidity, and Crash Risk in Pakistan. For this reason, an examination of these relationships using Pakistan's stock market, which is characterized by many challenges and distinctive market features, shall be of interest. As seen in the analysis done above, the market of this country is quite volatile, and the level of trust that investors are willing to place in the market is not very high; hence, the study of how these two variables affect Crash Risk is very crucial. Filling this gap in the literature can benefit policymakers, investors, and corporate managers who intend to understand the antecedents of the Pakistani economy.

2. Literature Review

2.1: Brand Capital and Stock Price Crash Risk

The process of retaining, creating, or developing a brand name through publicity or advertising is a crucial component in business and is usually called a logo or brand. In the same regard, Farquar (1989) has defined a brand as a name, symbol, or design, as well as a mark that aids the company in increasing the efficiency of the markets. Brand capital, which is considered to be one of the significant intangible assets of the firm, defines investors' recognition of the firm's products and services. It also indicates the firms' corporate image, product credibility, leadership profiles, and general standing or market offering (Aaker, 1996). Thus, in a firm's activity environment, brand capital is viewed as an essential production factor. In the context of Griliches (1979), brand capital helps a firm's sales go up through the addition of several customers and fulfilling their demand (Pillai, 2012). Brand capital has a strong relation with a firm's liabilities and other stakeholder performances that affect its worth in the long run, hence its market value

(Belo et al., 2014). According to Keller (2002), brand equity can significantly affect a firm's brand capital.

Among all the components of brand equity, advertising can be regarded as one of the most essential tools in creating a strong and long-term brand image. The ISM reported that based on its recent information, U. S companies utilized about $354 billion for promotional expenses in 2018, excluding non-advertising expenses. Prior empirical studies have pointed to the marketing department as one of the most strategic in a firm (Corrado et al., 2016). Some authors have looked at the overall advertising brand capital in 2018, and supposing that the stock of the US brands is representative, the authors Corrado et al. (2016) assessed the value of the US brand stock at $ 350 billion, about twice the 1995 level. This resulted in an increment in GDP of more than 75%, which gave a strong indication that advertising goes a long way in improving a firm's revenue.

Leone (1995) provided a meta-analysis of the study and pointed out that long-term advertising attitude accounts for more than one-half of one's total effect within the long-only time frame. Likewise, Bronnenberg et al. (2012) established that long-run advertising impacts brand awareness and purchase intentions of consumers. Various forms of advertising aimed at achieving goals reveal that short-term advertising strategies may not achieve much in the long run regarding brand awareness. The rationale for brand-building is that to be acknowledged and valued by the client, the brand must satisfy his or her needs for an extended amount of time. Similarly, Corrado et al. (2016) noted that although the value obtained by dividing the marketing capital by the corresponding capital intensity level decays with time, both capital ratio and decay rates, the future predicted of marketing capital stock will not change from the current advertising expenditure.

According to Vitorino (2014), brand capital ranges from as much as 6 percent to as much as 25 percent of a company's total market value, evidenced by its brand equity. Also, another research study by Peters and Taylor (2017) pointed out that brand capital positively impacts the firm's production factors and Market to Book-value. Going by the works of Lou (2014), firms that invest in brand capital are likely to have better returns than firms that do not. Barth et al. (1998) conducted an empirical study and realized that attracting brand capital returns more than advertising and other aspects. Furthermore, Chemmanur and Yan (2017) argued that the pre-IPO advertisement has a relatively higher value than the post-IPO advertisement to stress the significance of brand value for a company's market performance.

Most authors investigating the issues of brand capital paid attention to how the variable of brand capital is positively linked to the variable of stock returns. The result indicates a high possibility of companies having high brand capital yielding better returns than their counterparts (Belo et al., 2014). Large amounts of brand capital tend to translate into an average return figure of about 4 percent higher for the firms in question up to 6% more than their competitors (Eisfeldt & Papanikolou, 2013). Therefore, according to Gurion and Rudenko (2014), brand capital increases

the customer retention period and sales value among the firms. Building on this literature, these findings shed light on how brand capital contributes to the improvements of reputation and trust, as well as customer and investor reliability, which is necessary for regulating crash risk and for dealing with negative information releases.

Literature on Crash Risk has predominantly centered on establishing the antecedent conditions that compel managers to announce negative news in the market (Kim et al., 2011; Callen & Fang, 2013). This means that when there is negative information that makes it into the market, investors react tensely, and this is labeled the Crash Risk (Hutton et al., 2009). In their work, Gourio and Rudanko (2011) analyzed the interaction between customer capital and investment dynamics; this showed that customer capital and brand capital are closely related since both address the firm's goals.

The following review aimed at presenting Belo et al. (2014) study on the evaluation of brand capital as an intangible asset in listed companies and the potential risks connected to it. The researchers employed two approaches: The first consideration is based on firms with low capital but high average returns on a stock. In contrast, the second one is based on both high brand capital and high average returns on a stock. From the statistical results, brand capital has significantly positive relations with advertising expenditure and stock returns. Moreover, the present research analyzed the impacts of different internal factors, which include managerial incentives, board of directors, CEO overconfidence, corporate taxes, and informational asymmetry on Crash Risk (Kim et al., 2016, 2017, 2011). Other work also attempted to study the external conditions: ownership systems, product markets, and the liquidity of shares (An and Zhang, 2013; DeFond et al., 2014).

Huang et al. employed a study to analyze the connection between brand equity and Stock Price Crash Risk in the U. S central stock market, especially during the COVID-19 period. The research also showed that firms with higher brand capital were more effective in controlling the fluctuations in cash flows, especially during shocks in the market, thus providing a cushion against the Crash Risk. In their study, Hassan et al. (2022) employed machine learning techniques to investigate brand capital and Crash Risk and found a brand capital's inverse relation with Crash Risk. According to their research, they concluded that firms with higher brand capital will likely have a lesser probability of experiencing a decline in their stock prices.

H1: The higher Level of Brand Capital, the lower its Crash Risk.

2.2 Earnings Smoothing and Stock Price Crash Risk

Earnings smoothing is one of the most familiar polishing strategies in corporate business circles, and it focuses on giving the appearance of consistent earnings over a period of time. The former chief executive officer of General Electric, Jack Welch, muted the roller coaster of a business making the jagged results as a breakup of different business lines into a straight line and so continued delivering 100 plus quarters of earnings per share. In the literature, earnings

smoothing is viewed from two perspectives: first, it is used as an instrument so that the outside investors can forecast the further performance of a firm (Kirschenheiter & Melumad, 2002). In this way, it helps prevent trading profits that can be occasioned by inadequate evaluation of fluctuating earnings by less knowledgeable traders (Goel & Thakor, 2003). Earnings smoothing helps in a better prediction of future earnings, resulting in a favorable impact on both informed as well as uninformed investors.

The second possibility involves proposing that earnings smoothing may benefit the firm's management. Employees who smooth their earnings are in a better position to acquire incentives and job security than the rest (Healy, 1985). Earnings smoothing can also be used to safeguard managers' jobs through reducing fluctuation in earnings, according to (DeFond and Park, 1997). Another survey by Graham et al. (2005) on 400 top managers discovered that 97% of managers preferred earnings smoothing. The study also showed that the trend of earnings smoothing was more noticeable with CFOs, as it is favored since it is aligned with investors' least-risk premium.

In the past literature, the relationship between accounting quality and Crash Risk has been investigated comprehensively. While Jin and Myers (2006) revealed that Opaque Financial Information has a positively Significant relationship with Crash Risk. Here, the meaning of 'opaque' is used to depict the failure to release or give information on unpleasant news regarding the shares of a company that often leads to a crash. Hutton et al. (2009) carried out a similar study to further test the link between financial reporting opacity and Crash Risk, where the study established that the two are positively related. Two key aspects influence earnings smoothing within a company: first, the managers might employ earnings smoothing to mask any information perceived as detrimental to the company's performance. Second, Crash Risk may occur anytime earnings smoothing is interfered with by some conditions, including negative information and revelation (Chen et al., 2017).

According to Chen et al. (2017), the authors stated that managers tend to release information to the strategic external shareholders to sustain smooth earnings, thus lowering Crash Risk. Although extensive journals are published on earnings smoothing and Crash Risk, studies on the relationship between both aspects are rather limited. Thus, more research is needed to establish the link between earnings smoothing and Crash Risk to offer a clear understanding of the issue.

H2: As Earnings Smoothing increases, the Crash Risk the firms will experience decreases.

2.3 Relationship between Stock Liquidity and Stock Price Crash Risk

Several past studies have pointed out that crash risk rises when negative information regarding the company's stocks is withheld and then disclosed by management. Market Reaction is one of the factors that are defined by Stock Liquidity concerning news that is received within the market. Three conditions are typically associated with stock liquidity and its impact on Crash Risk: first, negative news exists, which could be a result of poor management performance;

second, stock management could withhold or even hoard the said information; and third, the market responds on realization of such negative news (Chang et al., 2016).

Therefore, this study's findings suggest an inverse relationship between stock liquidity and Crash Risk and that higher liquidity is the solution to the creation of bad news either by restricting the block-holders in governance or helping them implement their exit strategies. The first step is to collect all possible negative facts about the company and its stock, thereby strengthening the manager's awareness of the conditions of the market and the price per share. Also, larger stock liquidity decreases the fluctuation in trading due to negative information. Altogether, these results imply that as stock liquidity rises, Crash Risk may be reduced (Chang et al., 2016). However, stock liquidity also has the characteristic of attracting short-term investors who can accumulate negative information and then release it at one time. Besides that, can increase Crash Risk.

However, Crash Risk and stock liquidity have a positive value, thus requiring comprehensive research to support the subject. Therefore, this study seeks to identify and Analyze the Firms' Relative Stock Liquidity in the Pakistan Stock Market and investigate a research question that attempts to understand Crash Risk with the aid of a research gap analyzed from prior theoretical literature.

H3: The firms having high Stock Liquidity have a high probability of facing the Crash Risk.

3. Research Methodology

3.1 Research Design

This paper explores the following research questions: What is the nature of the association between brand capital, stock liquidity, and earnings smoothing on crash risk? The method used for this study is quantitative since quantitative research methods are appropriate for large-scale analysis that uses secondary data collected from relevant organizational databases. the use of secondary data is an efficient and inexpensive way of gathering data with the possibility of using panel data for the comprehensive analysis of the variables in the model. It allows for analyzing the effect of these variables at some epochs, thus furnishing sound information on the processes at work.

3.2 Population

The sampling frame for this research includes non-financial firms operating and with their stocks quoted on the PSX. These firms constitute a critical component of Pakistan's economy, and their financial information forms a reliable platform from which the research analyses the effects of brand capital, stock liquidity, and earnings smoothing on crash risk.

3.3 Sample

Hence, the sample comprises non-financial firms listed in the PSX for which data is available from 2012-2022. One decade allows for observing changes in the specified domain, pinpointing patterns, and increasing the credibility of the study's conclusions. These firms' annual reports are the source of this data.

3.4 Variables

The study focuses on three key independent variables: brand capital, stock liquidity and earnings management. Crash risk is the dependent variable. The control variables are the size of the firm, ROA, leverage, and a firm's MTB ratio.

3. 5 Measurements

- **Crash Risk** is computed using two variables: NCSKEW, which reflects the negative skewness of the distribution of stock returns, and DUVOL, which is the standard deviation of the down-market returns. The study applies methods established by Jin and Mayers (2006) and Kim et al. (2011) to compute these measures.
- **Brand Capital** is estimated based on specific advertisement costs, which indicate the amount of capital a firm stakes in the development of the brand. This approach is based on Belo et al. (2014), who related advertisement expenses to brand capital.
- **Earnings Smoothing** is assessed based on Tucker & Zarowin's (2006) as well as Kothari et al. (2005)'s models based on the toggle Class of abnormal accruals. This method relates pre-abnormal earnings with changes in abnormal accruals to offer another measure of the degree of earnings smoothing.
- **Stock Liquidity** is calculated by using the ILLIQ formula that demonstrates the revenue-generating capacity of stocks in relation to trading turnover. The methodology of calculating portfolio turnover is based on Kyle (1985) but modified by (Goyenko et al., 2009).

3. 6 Control Variables

As a result, the control variables include firm size, the return on assets, the extent of leverage, and the market-to-book ratio so as to eliminate other factors that might affect crash risk. Industry reference is normally established using firm size, which is determined as total asset, while ROA is obtained as a firm's net income over total assets. Leverage is computed by the debt-equity ratio, while the MTB ratio is the ratio of a firm's market value to its book value.

3. 7 Econometric Equation

The relationship between brand capital, stock liquidity, earnings smoothing, and crash risk is modeled using the following baseline regression equation:

$$CRASH_{it} = \beta 0 + \beta 1 BC_t + \beta 2 ES_t + \beta 3 + SL \sum \beta k Controls_{k\,t} + Year\ FE + Industry\ FE + e_t$$

Similarly, CRASH stands for crash risk, while BC, ES, and SL stand for brand capital, earnings smoothing, and stock liquidity, respectively. To control for other factors that may influence crash risk, control variables are included: year fixed effects (FE) and industry FE.

3.8 Methodology

Information collected from the sampled firms' annual reports is statistically processed using statistical software commonly referred to as STATA. For the main analysis, the implicating study uses descriptive statistics, VIF tests, GLS regression analysis, and stationarity tests to minimize Type I and II errors. In the context of econometric model analysis, it considers the association between the independent variables and crash risk while considering other factors that can distort the outcomes.

4. Results

4.1 Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Ncskew	660	.0066	.6163	-1.9141	2.5253
Duvol	660	.0872	.1208	-.3302	.4846
ES	660	7.5507	.6047	5.9224	8.9352
BC	660	2.90e+08	6.47e+08	23000	6.56e+09
SL	660	3.16e-06	.0000	-.0002	.0015
FS	660	2.3913	6.9264	.05035	166.5314
ROA	660	.0800	.08238	-.2428	.4079
Leverage	660	.2173	.2103	0	1.3525
MTB	660	1.4450	3.2316	.08	64

Table-1: Descriptive Statistics

In table-1, descriptive statistics for the study variables give information on the dataset's dispersion or spread of values. The study covers 660 observations for each variable in each of the studies. Thus, the data is usually distributed but slightly skewed, and the range of customer satisfaction was from -1—9141 to 2. 5253, meaning that the skewness in the firm's data varies considerably. From the results, Duvol presents mild fluctuations around the mean of 0. 0872 and standard deviation of 0. 1208, ranging from -0. 3302 to 0. 4846, implying that downside risk was unstable within the firm.

The Mean of Earnings Smoothing (ES) is 7. 5507; the range is relatively narrow and varies only in single figures 5. 9224 to 8. It amounts to 9352 annually, suggesting that firms' earnings management is always constant. Brand Capital (BC) also measures an average of 2 differently. Equity expansion grew to 90e+08 with a significant standard deviation of 6. 47e+08 indicates that firms' brand investments are considerably differentiated. Stock liquidity (SL) is also low and is estimated to equal 3 in terms of the mean. This statistic is equal to 16e-06, which testifies to low trading turnover.

There is a wide dispersion in the Firm Size (FS), thus presenting a significant variability in the size of the companies included in the sample; for the ROA (Return on Assets), the mean is equal to 0. 0800, reflecting moderate profitability. Leverage has to be between 0 and 1. 3525 represents variability in the debt of firms in question. Last, MTB (Market-to-Book ratio) varies between 0. from $08 to $64, complicating the notion of corporate, which shows the disparity in firms' market value compared to their book values. These descriptive statistics are vital to identifying the dataset's properties and as a prerequisite in subsequent analyses (George & Mallery, 2018; Kaur et al., 2018).

4.2 Pairwise Correlation

NCSKEW	(1)	(2)	(3)	(4)	(5)	(6)	(7)
NCSKEW	1.0000						
DUVOL		0.2971*	1.0000				
	0.0000						
ES	0.1894*	-0.2245*	1.0000				
	0.0000	0.0000					
BC	0.1220*	0.0661	0.0543	1.0000			
	0.0015	0.0981	0.1569				
SL	-0.0449	0.0817*	-0.0916*	-0.0237	1.0000		
	0.2634	0.0375	0.0179	0.5648			
FS	0.0311	0.0302	0.0465	0.0739	-0.0022	1.0000	
	0.4027	0.4437	0.2298	0.0642	0.9624		
ROA	-0.0757	-0.0061	-0.1246*	0.1217*	-0.0294	-0.0072	1.0000
	0.0542	0.8973	0.0017	0.0019	0.4661	0.8802	
LEVERAGE	0.0581	-0.0103	0.1190*	-0.1014*	0.0009	-0.0355	-0.5074*
	0.1472	0.8123	0.0024	0.0083	0.9727	0.3731	0.0000
MTB	-0.0323	0.0015	0.0291	-0.0585	-0.0125	-0.0142	0.0710

0.4249	0.9891	0.4702	0.1401	0.7748	0.7499	0.0727

* Indicates significance at the .05 level

Table-2: Pairwise Correlation

In table 2, the pairwise correlation table indicates the inter-variable relationships of all the important variables used in the study, concentrating on NCSKEW; stock price crash risk. DUVOL has a slight positive relation with NCSKEW which has a coefficient of 0.2971, this means that as downside volatility rises the crash risk goes up as well. Earnings Smoothing (ES), in particular, has a significant and positive coefficient for NCSKEW (0.1894); and a higher level of earning distribution may result in a higher crash risk. Brand Capital (BC) has significantly a small positive correlation with NCSKEW of equal to 0. 1220, means, higher the brand investments the more might expose to crash risks. Stock Liquidity (SL) has a small negative and insignificant relationship with NCSKEW with a value of -0. 0449, implying that higher stock liquidity has a reduced crash risk although the relationship is quite small. Firm Size (FS) and Market-to-Book (MTB) ratios have measure a very weak association of NCSKEW, and thus appears not to affect the crash risk in any way. ROA has a negative relationship with NCSKEW equal to (- 0.0757) which reveal that enhancing the possibility of earning a higher profit will decrease the crash risk. Leverage is positive but weakly related with NCSKEW (r = 0. 0581) and hence it can be seen that higher leverage enhances crash risk.

4.3 Multicollinearity test for VIF

VARIABLE	VIF
ROA	1.37
LEVERAGE	1.35
ES	1.11
DUVOL	1.06
BC	1.05
SL	1.00
MTB	1.02
FIRMSIZE	1.00
MEAN VIF	1.11

Table-3: VIF

In table 3, multicollinearity of the predictor variable in the regression model is checked through the Variance Inflation Factor (VIF) table. When the VIF value approaches 1, this suggests a low level of multicollinearity among the variables i.e no high correlation among the variables of the model. Therefore, the VIF analysis in this table illustrates that ROA and Leverage own the

highest VIF of 1.37 and 1.35. The Mean VIF is 1.11 This, in turn, demonstrate that multicollinearity is not an issue in this model, so the coefficient estimates can be trusted.

4.4 GLS

VARIABLES	NCSKEW	DUVOL
ES	.1698***	-.0463***
	(.03915)	(.0075)
BC	1.09e-10***	1.53e-11***
	(3.65e-11)	(7.14e-12)
SL	-266.1045***	-115.0021***
	(371.4762)	(72.4856)
FS	.0013*	.0007*
	(.0032)	(.0007)
ROA	-.4264***	-.0562***
	(.3327)	(.0651)
LEVERAGE	.0563**	.0053**
	(.1297)	(.0253)
MTB	-.0048*	.0006*
	(.0073)	(.0015)
_CONS	-1.3042***	.4321***
	(.3009)	(.0588)
OBSERVATIONS	658	658
NUMBER OF GROUPS	11	138

"The coefficient is statistically significant at the 1%, 5%, or 10% levels"

Table-4: GLS Model

The insights we have from the GLS regression results are on factors that affect stock price crash risk which is measured by NCSKEW and DUVOL; several financial variables have been tested. The results indicate that Earnings Smoothing (ES) has a positive relationship with NCSKEW (0. 1698***), and thus, firms with smooth earnings distributions are likely to have higher crash risk. Nevertheless, ES is indicative of negative correlation with DUVOL (-0. 0463***), suggesting that un-smoothed earnings might cut down downside volatility. Brand Capital (BC) has a positive and significant relationship with both NCSKEW (1. 09e-10***) and DUVOL (1. 53e-11***) meaning that higher brand capital results in higher crash risk and downside risk of returns.

Stock Liquidity (SL) demonstrates a strongly negative correlation with total NCSKEW (-266. 1045**) and DUVOL (-115. 0021**) proving that higher liquidity leads to the minimization of

the crash risk and volatility. NCSKEW. The coefficient of Firm Size (FS) reveals a positive though less significant relationship with NCSKEW (0. 0013*) which indicates that greater firms' crash risk and volatility is a possible outcome. Return on assets (ROA) has a negative relation with both NCSKEW (-0. 4264***) and DUVOL (- 0. 0562***), which means that firms with a higher value in ROA have a lower crash risk as well as lower volatility of returns.

Leverage is 0. 0563** significantly positive and related to NCSKEW to indicate that higher leverage leads to high crash risk and DUVOL, 0. 0053** significant positive to mean high downside volatility. Market-to-Book Ratio (MTB) influences NCSKEW with a coefficient of - 0. 0048* meaning a small negative effect on crash risk and has a positive effect on DUVOL with a coefficient of 0. 0006* for crash risk and volatility. NCSKEW has been regressed at -1. 3042*** while DUVOL at 0. 4321***, represents the constant term and depicting the base level of crash risk and volatility while controlling the other coefficients. The number of observations and groups are 658 and 11 for NCSKEW and 658 and 138 for DUVOL the results affirm the strength of the research data set. Coefficients' significance is expressed in relation to 1%, 5%, or 10% percentiles.

Hypotheses	Results
H1	Accepted
H2	Accepted
H3	Rejected

Table-5: Hypotheses Table

Table-5 summarizes the study's hypothesis testing outcomes. H1 and H2 are accepted, indicating that the proposed relationships for these hypotheses were supported by the data. H3 is rejected, meaning the expected relationship for this hypothesis was not confirmed. This table provides a concise overview of the hypothesis validation process.

Conclusion and Recommendation:

Thus, the study's results elucidate how a set of factors works to determine the risk of a stock price crash, as defined by NCSKEW and DUVOL. The analysis also proves that both Earnings Smoothing (ES) and Brand Capital (BC) have a positive relationship with crash risk and downside volatility, which implies that firms with smoother earnings and high branding investments could be more susceptible to a crash. On the other hand, Stock Liquidity (SL) has a buffer role; therefore, it asserts a negative relationship between crash risk and volatility, which shows that stocks with high liquidity are less prone to sharp price fluctuations. In conclusion, all the variables of the study have moderately significant relationships with the crash risk, meaning that larger firms (FS) have slightly higher risks of crashing than small firms. As a result, profitability represented by Return on Assets (ROA) is efficient enough to mitigate a crash risk

and volatility, with the financial performance being critical in stabilizing the prices. Leverage, on the other hand, influences the parameters of crash risk and downside volatility in a negative way, illustrating all the risks of high amounts of debt in the capital structure of the firm. results also Mixed; while they suggest a fragile negative relation between crash risk and the MTB, they also support the idea that firms rated higher in terms of their market-to-book ratio may suffer more significant price swings, meaning higher volatility.

With the established results, Microstructure researchers recommend that firms aim to achieve reasonable financial leverage to Reduce Crash Risk. Especially the excess dependency on earnings smoothing and brand building must be suitably handled by corporations to avoid undesirable dependence on such external shocks. Increasing the liquidity of stocks must be a goal because of its efficiency in mitigating the potential for crashes and high variability. To enhance this, firms should strive to match their Return on Assets (ROA) since attaining efficiency and profitability in its operations will help calm down the stock prices and avoid their free fall. Further, it is also found that there is a positive relationship between leverage and crash risk; hence, it is advised to be cautious with leverage. On their part, the investors should include these factors when making a choice of firms in which to invest, and it is recommended that investors should choose firms with high liquidity, high ROA, and moderate leverage in a bid to avoid appalling stock price drops. Through the application of these strategies, firms would be in a position to manage and reduce the vulnerability of their stocks from market volatility, with investors equally being in a position to make wiser choices to guard their investments.

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