Impact of Business Strategy on Stock Price Crash Risk: Role of Overvalued Equity

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A B S T R A C T

The objective of the current study is to investigate the impact of business strategies on the future crash risk of stock prices by considering the role of overvalued equity. This relationship is checked by taking non-financial firms from Pakistan Stock Exchange from 2008-2016. To evaluate the business strategy, composite strategy score is used which considers the firm’s development and research costs to look for new products, sales ratio to determine the firm’s capacity to manufacture the product efficiently, standard deviation of employees, sales growth, marketing expense to sales ratio to locate the firms’ emphasis on marketing, and intensity of assets expenditures to capture the firms’ emphasis on production. Market to book decomposition method is used to calculate the equity overvaluation whereas the negative conditional skewness is used as a measure of crash risk. Random and fixed effect panel regression models are used to estimate the results. The results of the present study indicate that firms pursuing innovative strategies have a higher probability to face crash price risk. Outcomes of the study also confirm that such strategies also increase the likelihood of equity overvaluation which increases the risk of stock price crash in the future. The results of the current study are helpful for the investors in allocating the assets cautiously among companies with diverse strategies.

Keywords: Business Strategy, Equity Overvaluation, Crash Risk

1. INTRODUCTION

This study examines the impact of business strategies on the crash risk of the future stock price. We analyze this relationship by considering the role of equity overvaluation. By investigating the degree to which firms pursuing the peculiar business strategy are less or more prone to crash risk, this study gives evidence that improves our perceptive about the fundamental elements of crash risk and helps the shareholders for placement of funds in the business that are less risky.
Since the financial crisis of 2008, the interests of investors regarding crash risk has increased. Due to the crisis, the panic of lowering the price level of stocks has shaken the confidence level of potential investors. This research warrants the effects of perceived cash risk of investors. Crash risk can be considered as an important element for investors as it is much different from the risks originating from systematic volatilities (Sunder, 2010). In finance literature, crash risk is led by the theory of bad news hoarding. It explains that the enticement of manager for concealment of bad news for a longer time span raises the likelihood of crash risk. As such gathering of bad news put on inception, it is at once exposed to the market that directs a huge decline in the level of stock prices (Jin & Myers, 2006).

There are several factors available in the literature that can lead to crash risk. These factors includes opaque financial reporting proxy that contains accruals as well as real earnings management (Francis, Hasan, & Li, 2016; Hutton, Marcus, & Tehranian, 2009; C. Kim, Wang, & Zhang, 2018) tendency of escaping from tax (J. B. Kim, Li, & Zhang, 2011b) equity reward of CFO (J. B. Kim, Li, & Zhang, 2011a), analyst coverage (Huang, 2018), common business group and lower market to book ratio (Kwon, Jung, Sunwoo, & Yim, 2019), equity index future (Liu & Zhong, 2018), stock merger and acquisition (Jory, Ngo, & Susnjara, 2019), political connection (Tee, 2018), informal institutional mechanism and capital market transaction (Habib, Hasan, & Jiang, 2018), and Market inattention (Xiang, 2018). Recent literature (e.g. (Bentley, Omer, & Twedt, 2017) shows that these factors can be figured out to a certain level by adapting exclusive organization strategies followed by the firms that linger comparatively stable over time (Hambrick, 1983; Snow & Hambrick, 1980). This persuades to claim that organizational strategies and plan of the firms have the potential to put prime effects on the risk of a crash.

Miles, Snow, Meyer, and Coleman Jr (1978) described that because of distinction in direction and scale of change about their product and market, there exist three possible strategies synchronously within industries such as prospectors, analyzers, and defenders. It has been observed that due to being innovation-oriented; Prospectors alter their marketing mix of the products frequently. On the other hand, defenders strive on the base
of service, quality, or price concentrating more on a limited product base. Previous researches on the theory of organization have established that innovators are overwhelmed with more asymmetry of information due to a greater level of output uncertainty (Rajagopalan, 1997; Singh & Agarwal, 2002), and this greater level of asymmetric information could deliver prospects for misrepresentation of financial records.

However, Bentley, Omer, and Sharp (2013) demonstrated that the prospectors are more involved in irregularities in financial reporting regardless of the deceptive escalation in the efforts of the auditor, who could alleviate information asymmetry by preparing statements of financial records more reliable. Bentley, Newton, and Thompson (2016) practically examined that viable explanations regarding prospector’s frequent experience of the restatement are because of the complex risk of control. Precisely, they observed that internal checks over financial disclosure facilitate the connotation between restatements and strategy. Therefore, possibly auditors and managers of these firms surface more troubles in recognizing and reporting material flaws in time that permitting the firm to stockpile bad news. Moreover, managers with innovative strategies can highly opt to stockpile negative news due to these factors such as executive reimbursement structure, the higher tendency of avoidance of taxes (Higgins, Omer, & Phillips, 2015) and experiencing legal action risk. To sum up all these arguments, hoarding of bad news proclivity connected with innovator strategies make it highly susceptible to the risk of a crash.

However, exiting literary work also implies that prospectors might be less effected by the information asymmetry relative to defender due to higher voluntary disclosures and analyst coverage that decreases information asymmetry (Bentley et al., 2013; Bushee, Core, Guay, & Hamm, 2010). However, the perspectives propose that prospectors are less likely to experience the crash risk as they have more crystalline information environment. Nonetheless, the occurrence of asymmetrical information itself is not the principal cause for greater financial misrepresentation practiced by innovators. For instance, Bentley et al. (2016) advised that companies pursuing innovative strategies are connected with fragile internal control.
After that, we inspect whether the overvaluation of equity intercedes the link between risk of crash and organization strategies. Jensen (2004) disputes that equity overvaluation generates the problem of agency cost that guides the managers to involve destructing activities like frauds and administer earnings (Chi & Gupta, 2009; Houmes & Skantz, 2010). Companies with innovative strategies are very likely to undergo the equity overvaluation due to an extremely positive prospect about their growth in the future. By following these controversies that overvalued equity stimulates the managers to do the financial misrepresentation, it shows that risk of stock price crash will be greater for the innovators during the period of equity overvaluation.

To determine the relationship between crash risk and firm-specific business strategies, we use the negative conditional skewness (NSKEW) to measure the crash risk as a dependent variable. Discrete strategy score of Bentley et al. (2017) is used as a measure of business strategy. Bentley et al. (2017) structured this measure on the basis of the influential work of Miles et al. (1978).

This study makes a significant contribution to the literature on business strategy and crashes the risk of the stock price in several ways. First, getting an insight into the effect of organization strategies on the risk of share price crash will help the investors in apportioning funds wisely. This pragmatic study demonstrates that the business strategies of a company can highly affect the risk of a crash, a discovery that firms can take into account when shaping the corporate strategies. Secondly, we add to the literature by supporting that organization strategies devour the potential to impact a higher level of hostile outcome that has direct economic concern for investors. Previous researches on firms' strategies scanned the outcome of strategies of both the business and corporate units on firm performance pursuing the paradigm of structure conducts and performance (McNamara, Luce, & Tompson, 2002; Smith, Grimm, Young, & Wally, 1997). Despite the impact of organizational strategies on crash risk inclinations still has not been scrutinized in the context of Pakistan.

2. LITERATURE REVIEW

Crash risk of the prices of stocks at the level of firms indicates the likelihood of
identifying extremely negative observations in firm’s return distribution after making adjustments of portions of returns that also move with co-factors (Jin & Myers, 2006). To understand the antecedents and aftermath of crash risk is vital due to its direct effect on the welfare of investors. Jin and Myers (2006) scrutinize information asymmetry between outsiders and insiders that can be associated with crash risk. Precisely, it was observed that opaque stocks are highly exposed to the risk of a crash due to the management propensity to reserve unfavorable information. Hutton et al. (2009) checked this hypothesis precisely by taking the absolute accrual as a measure of opaque financial representation and discovered that this financial misrepresentation increases the risk of a crash. Francis et al. (2016) expanded Hutton et al. (2009) finding by acknowledging that crash risk also rises with real earnings management.

Miles et al. (1978) categorized three worthwhile strategies of doing business that can occur instantaneously within the context of industries; prospectors, analyzers, and defenders. Prospectors quickly modify the product marketing mix to become an innovative leader of the market, defenders focus on more stable and even narrow stable product basis to grapple the source of quality, service, and price. On the other hand, analyzers possess the traits of both of them (Miles et al., 1978). This study associates the strategy taxonomy to crash-risk and claims that due to the following reasons, prospectors are highly exposed to crash-risk.

2.1. Growth Opportunities, Outcome Ambiguity, Project Disasters, and Crash

The speedy progress of prospectors escalates the likelihood of financial disclosure inconsistencies arising from financial misrepresentation which is one of the key factors of crash price risk (Hutton et al., 2009). Historically, growth stocks underperformed comparatively because typically growth firms could not meet overly enthusiastic expectations of the investors. As soon as these potentials are not fulfilled afterward, the prices of growth stocks fall (Lakonishok, Shleifer, & Vishny, 1994). This likelihood induces the managers of growing firms for holding back the bad news to maintain this overvaluation level. Skinner and Sloan (2002) discovered growing stocks to display higher negativity to adverse earnings, so stirring executives for delaying the publishing of bad news that subsequently leads towards a crash. Nevertheless, it’s
implausible that growth prospects explicate crash-risk incidence for innovators. It is much reasonable that great level of results insecurity and connected risk of the failure of the project are more expected factors of crash-risk. It is even in accordance with the statement of auditing standard 99 (SAS 99) which indicate that incentive or pressure provides the reason to the manager for distorting the financial records. Thus project disappointment, result uncertainty and inability to encounter excessively enthusiastic opportunities may source stock price of prospectors to plunge.

2.2. Financial Misrepresentation, Bad News Hoarding, and Crash Risk

As explained earlier, existing literary work has recognized the misrepresentation of financial records to be an essential antecedent of crash-risk that follows the opinions anticipated by Jin and Myers (2006). It has been observed that companies would be less or more exposed to misquoting of financial records and therefore crash risk must be examined for inducements, general information environment, and opportunities. Bentley et al. (2016) contended that prospector firms are more expected to gain weak internal controls against financial representation. This is concluded that auditors and managers of these firms face more trouble in timely reporting and perceiving material feebly which expedite the prospector firms to store bad news that ultimately results in crash risk.

2.3. Equity Motivation, Misreporting, and Crash

Dissimilarity in managerial reimbursement structures, in defender and prospector firms, also underwrite the likelihood of risk of the stock price crash. Prospectors concentrate on innovation by making larger investments in R & D that produces larger outcomes, and hence, require remuneration with long term perspective and inducing the management risk-taking (Balsam, Fernando, & Tripathy, 2011; Ittner, Larcker, & Rajan, 1997; Rajagopalan, 1997; Singh & Agarwal, 2002). Balsam et al. (2011) documented reduced stress on accounting procedures chasing differentiation strategies and have the need for investment in innovative products and brand recognition for that accounting handling flop to detention value creation. Whether the Innovation based compensation plan would boost executives to misrepresent is not corroborated. Though, existing studies generally have recognized managers as mortified of handling earnings to amplify their reimbursement (e.g., Beneish, 1999; Burns & Kedia, 2006; Efendi, Srivastava, &
Swanson, 2007) For instance, Bartov and Mohanram (2004) discovered that exercising the option is the result of earning management. Cheng and Warfield (2005) found that holding and exercising stock options work incentive for firms to beat or meet earning goals. The above discussion leads towards the formation of hypothesis:

**H₁. Firms having prospector (defender) business Strategies are more(less) exposed to the risk of a crash.**

The second proposition examines a network, overvaluation, with which positive relationship between crash risk and organization strategies is probable to obvious. Jensen (2004) postulated that over-valuation could provoke a new sort of agency costs. Jensen (2004) contended that managers have inducements to lengthen misrepresentation because “public paid them to achieve certain goals”. This directs the public to fixture the system by maneuvering both the fixing of the goals and how the managers achieve these goals.

The detrimental effect of earnings management in the capital market is provided by these counterproductive compensation systems and target based budgets. And the motivation to sustain overvaluation is the foundation of this resulting lack of truth. Although the equity overvaluation rises the investor’s anticipation about future returns these overvalued firms don’t have sufficient value adding investment projects to justify this overvaluation.

We claim that prospectors are further exposed to equity overestimation because earlier studies made known that investors are too much confident about the prospect of growth stocks. (Lakonishok et al., 1994); Skinner and Sloan (2002) demonstrated that profits of these growth firms are unevenly concentrated on earnings announcement and this concentration suggests that information in stock prices contain systematic errors following the predictable surprises on the announcement of earnings. Baker and Wurgler (2006) discovered that overvaluation driven by sentiments is prominent for highly volatile stocks, intense growth stocks, and non-profitable stocks. Some of these characteristics are common in prospector firms. As a result, managers intentionally withhold negative information to sustain this overvaluation through value destroying earning management. This opaque financial reporting damages the ability of capital markets to reflect this negative information into stock price. However, there comes a time
when it becomes difficult to hide this information from shareholders and consequently causes the crashes in firm's stock prices (Bergman & Roychowdhury, 2008; Jin & Myers, 2006; Risso, 2008). As the prospectors are more disposed to overvaluation, we develop the following hypothesis on the basis of the above discussion:

**H2. Overvaluation has a positive effect on crash risk for firms having prospector business strategies.**

3. RESEARCH METHODOLOGY

3.1. Population and Sample

Firms, listed on Pakistan Stock Exchange, form the population. There are 559 listed firms; we have initially selected all the firms on the PSX 100 index as a sample for this study, covering a time period from 2008 to 2016. Financial firms are then excluded, leaving a total of 78 non-financial firms. However, the final sample includes 84 non-financial firms because, in order to run the regression model for fundamental value, we required at least 5 firms in each sector. So where there were less than 5 firms in a sector, we added more firms. Data is collected from annual financial statements; the data of share prices are collected from the business recorder and the official website of PSX.

3.2. Stock Price Crash Risk

We use the value of residual from equation (1) as a measure of crash risk.

\[
\text{r}_{j,t} = \alpha_j + \beta_{1j}\text{r}_{m,t-2} + \beta_{2j}\text{r}_{m,t-1} + \beta_{3j}\text{r}_{m,t} + \beta_{4j}\text{r}_{m,t+1} + \beta_{1j}\text{r}_{m,t+2} + \epsilon_{j,t} \quad (1)
\]

Crash risk is determined by taking the negative conditional skewness of the weekly returns as follows:

\[
\text{NCSKEW} = -\frac{[n(n-1)^{3/2}\sum w_{j,t}^3] / [(n-1)(n-2)(\sum w_{j,t}^2)^{3/2}]} \quad (2)
\]

3.3. Business Strategy

Discrete combination strategy score associated with Bentley et al. (2017) is used to measure organization strategy for the business. Higher scores characterize companies following prospector approaches and lower score characterize firms following defender policies. Bentley et al. (2017) modified the model of Ittner et al. (1997) a little and explained other procedures based on Miles et al. (1978) structure in developing their composite strategy score. The factors include R&D expenditures, number of employees, sales growth, marketing expenditure capital intensity, and net PPE.
All factors are calculated using a progressing average over the last five years. All of these factors are ranked within each industry year. Highest observation of each factor is assigned a score of 5 and the observation of variables having lowest value is given the score of 1 (excluding capital intensity, that score is retreated by assigning the score of 5(1) in the lowest (highest). After that, marks across six factors are summed for each business year in this way that each company could receive the highest scores of 30 as compared to a minimum score of 6. In this sample, a range between minimum and the maximum score is 6 and 29.

3.4. Equity Overvaluation

To measure the equity overvaluation, Rhodes–Kropf, Robinson, and Viswanathan (2005) methodology is used. M/B ration is decomposed firm level mispricing \( \text{Dev}^{\text{firm}}_i \). Aggregate level mispricing or time series industry error \( \text{Dev}^{\text{Agg}}_i \) and growth component (\( \text{Git} \)). Firms are said to be overvalued if the value of \( \text{Dev}^{\text{firm}}_i \) is positive. Overvaluation is the difference between market value and fundamental value. It is denoted by \( \ln(M) - \ln(v(0_i; \alpha_t)) \). The fundamental value of firm \( v \) calculated in two steps.

\[
\ln(M)_{it} = \alpha_{0it} + \alpha_{1it}\ln(B)_{it} + \alpha_{2it}\ln(|NI|)_{it} + \alpha_{3it}(\ln |NI|_{it}) \times D_{(NI_{it} < 0)} + \alpha_{4it} \times LEV + \varepsilon_{it}
\] (3)

First, the above model is calculated for each sector for each year, where \( M \) is market value, which equals: share price \( \times \) share outstanding \( + \) total asset \( - \) equity, \( B \) is book value of Asset, \( NI \), the net income, Secondly, after estimating the multiples from equation (3), fundamental value \( v(0_i; \alpha_t) \) is predicted by using these multiples and accounting data.

Mispricing at aggregate level \( \text{Dev}^{\text{Agg}}_i \) is measured as the deviation of fundamental value based on current information from fundamental value based on long run industry multiples. It is denoted by \( v(0_i; \alpha) - v(0_i; \alpha) \). These long term multiples are obtained by taking the averages of the multiples overtime period. A positive value of \( \text{Dev}^{\text{Agg}}_i \) shows that the market has a positive sentiment and negative market sentiments in case of the negative value of \( \text{Dev}^{\text{Agg}}_i \). This deviation is not due to the investor irrationality because long run multiples are based on the information that is expected unknown to investors but known to the management. Sum of firm-level mispricing and time series sector error are used to determine the total error of overvaluation.
The third component of decomposition is growth. It is the deviation of fundamental value based on long run multiples from book value. This growth component of the market to book decomposition is not contaminated by mispricing and it is a fundamental part of the stock price.

3.5. Empirical Model

In order to examine the impact of organizational strategies on the crash risk of future stock prices, we regress the crash risk of current stock prices on strategy and other control variables by using their one year lagged values as follows:

\[
\text{Crash}_{i,t} = \beta_0 + \beta_1 \text{crash}_{t-1} + \beta_2 \text{strategy}_{t-1} + \beta_3 \text{Turn}_{t-1} + \beta_4 \text{RET}_{t-1} + \beta_5 \text{SRET}_{t-1} + \beta_6 \text{size}_{t-1} + \beta_7 \text{leverage}_{t-1} + \beta_8 \text{MTB}_{t-1} + \beta_9 \text{REM}_{t-1} + \beta_{10} \text{IDACI}_{t-1} + \epsilon
\]

Crash risk is measured by NCSKEW estimated by eq 1 and 2. The strategy is calculated by using the composite score of different ratios ranging from a minimum 6 to maximum 30 as described above. By reviewing the literature, different control variables are used as an antecedent of crash risk. Turnover ratio (Turn) is calculated by taking an average of monthly turnover ratios; RET is an average of weekly returns. SRET is the standard deviation of weekly returns MTB calculated as the market value of equity divided by the book value of equity shows that growth firms are more exposed to the risk of a crash (Hutton et al., 2009). REM and IDACI are the proxies of opaque financial reporting (Francis et al., 2016). REM and absolute DAC are the proxies of opaque financial reporting (Francis et al., 2016) measured by using equation 5, 6 and 7.

\[
\frac{\text{CFO}_{jt}}{\text{TA}_{jt-1}} = \alpha_0 + \alpha_1 (1/\text{TA}_{jt-1}) + \alpha_2 (\text{sale}_{jt}/\text{TA}_{jt-1}) + \alpha_3 (\Delta \text{sale}_{jt-1}/\text{TA}_{jt-1}) + \epsilon_{jt}
\]

\[
\frac{\text{PROD}_{jt}}{\text{TA}_{jt-1}} = \alpha_0 (1/\text{TA}_{jt-1}) + \alpha_1 (\text{sale}_{jt}/\text{TA}_{jt-1}) + \alpha_2 (\Delta \text{sale}_{jt}/\text{TA}_{jt-1}) + \alpha_3 (\Delta \text{sale}_{jt-1}/\text{TA}_{jt-1}) + \epsilon_{jt}
\]

\[
\frac{\text{DISX}_{jt}}{\text{TA}_{jt-1}} = \alpha_0 (1/\text{TA}_{jt-1}) + \alpha_1 (\text{sale}_{jt-1}/\text{TA}_{jt-1}) + \epsilon_{jt}
\]

Discretionary accruals are estimated by using modified Jones model as follows:

\[
\text{ACC/TA}_{t-1} = \beta_0 + \beta_1 [(\Delta \text{sales}_{t-1} - \Delta \text{Receivable}_{t-1})/\text{TA}_{t-1}] + \beta_2 (\Delta \text{PPE}_{t-1}/\text{TA}_{t-1}) + \beta_3 (\text{ROA}_{t-1}) + \epsilon_{t}
\]

In order to test the Hypothesis 2, following model is estimated separately for both the prospectors and Defender group:

\[
\text{Crash}_{i,t} = \beta_0 + \beta_1 \text{crash}_{t-1} + \beta_2 \text{TVE}_{t-1} + \beta_3 \text{Growth}_{t-1} + \beta_4 \text{Turn}_{t-1} + \beta_5 \text{SRET}_{t-1} + \beta_6 \text{size}_{t-1} + \beta_7 \text{leverage}_{t-1} + \beta_8 \text{MTB}_{t-1} + \beta_9 \text{IDACI}_{t-1} + \beta_{10} \text{REM}_{t-1} + \text{RET}_{t-1} + \epsilon
\]
variables are as explained earlier. It is expected that coefficient value of TVE is greater in prospector firms than defenders, as the prospectors are more likely to sustain the overvaluation.

4. RESULTS AND DISCUSSION

4.1. Diagnostic Tests

To analyze the association between business strategy and crash risk, fixed and random panel regression methodology is used. Fixed effect and random effect model is chosen by using the Hausman test (Hausman, 1978).

Normality and linearity of data are also checked. To run the regression, all the regression assumptions are checked. The breusch pagan test is applied to test the Heteroskedasticity of data and the problem of Heteroskedasticity is adjusted by applying the GLS weights. Through the Durbin-Watson test, autocorrelation between the residuals is also analyzed. E-views is used for analysis of data.

4.2. Descriptive Statistics

Table 1: Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>CRASH</th>
<th>Crash&lt;sub&gt;t-1&lt;/sub&gt;</th>
<th>Turn&lt;sub&gt;t-1&lt;/sub&gt;</th>
<th>Strategy&lt;sub&gt;t-1&lt;/sub&gt;</th>
<th>SRET&lt;sub&gt;t-1&lt;/sub&gt;</th>
<th>Size&lt;sub&gt;t-1&lt;/sub&gt;</th>
<th>Lev&lt;sub&gt;t-1&lt;/sub&gt;</th>
<th>MTB&lt;sub&gt;t-1&lt;/sub&gt;</th>
<th>Growth&lt;sub&gt;t-1&lt;/sub&gt;</th>
<th>TSE&lt;sub&gt;t-1&lt;/sub&gt;</th>
<th>DAC</th>
<th>REM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>-0.11245</td>
<td>-0.2639</td>
<td>0.353650</td>
<td>15.37101</td>
<td>0.045419</td>
<td>16.66447</td>
<td>0.129624</td>
<td>0.036916</td>
<td>2.709723</td>
<td>2.413793</td>
<td>0.2167</td>
<td>0.4786</td>
</tr>
<tr>
<td>Median</td>
<td>0.19274</td>
<td>0.29512</td>
<td>0.028080</td>
<td>17.00000</td>
<td>0.039685</td>
<td>16.55230</td>
<td>0.092200</td>
<td>0.325971</td>
<td>4.286800</td>
<td>0.589600</td>
<td>0.2543</td>
<td>0.5143</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>1.028307</td>
<td>1.005874</td>
<td>0.755267</td>
<td>2.871200</td>
<td>0.035744</td>
<td>1.928734</td>
<td>0.125955</td>
<td>1.064085</td>
<td>5.933680</td>
<td>8.920125</td>
<td>0.5123</td>
<td>0.1845</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.558245</td>
<td>-0.540194</td>
<td>2.367086</td>
<td>0.333710</td>
<td>4.162735</td>
<td>0.663755</td>
<td>1.455929</td>
<td>2.835292</td>
<td>-1.443840</td>
<td>1.610020</td>
<td>0.6754</td>
<td>0.2363</td>
</tr>
</tbody>
</table>

Table 1 shows the descriptive statistics; the mean value of crash risk is -0.1125 with standard deviation -0.55. The mean value of the strategy is 15.37 with a standard deviation of 0.333. This shows that on average firms listed on PSX follow the innovative business strategies. The mean value of turn is 0.35 with standard deviation 2.367 shows that average monthly trading volume is 35%. The mean value of weekly returns 0.47%, stock returns volatility of 45%, MTB of 36%. The average value of REM is 47% while the absolute value of discretionary accruals is 0.21. The average value of total sector error (TSE) is 2.137 showing that on average firms are overvalued.
### Table 2: Business Strategy and Stock Price Crash Risk

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>T-statistics</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.674647</td>
<td>1.274335</td>
<td>0.2034</td>
</tr>
<tr>
<td>Crash-t-1</td>
<td>-0.243270</td>
<td>-5.346260</td>
<td>0.0001</td>
</tr>
<tr>
<td>Strategyt-1</td>
<td>0.045918</td>
<td>-1.889675</td>
<td>0.0597</td>
</tr>
<tr>
<td>Size t-1</td>
<td>0.009610</td>
<td>2.0768</td>
<td>0.03847</td>
</tr>
<tr>
<td>MTBt-1</td>
<td>0.017379</td>
<td>1.7768</td>
<td>0.07821</td>
</tr>
<tr>
<td>Turn t-1</td>
<td>0.170043</td>
<td>1.979278</td>
<td>0.0486</td>
</tr>
<tr>
<td>Leverage t-1</td>
<td>-1.689455</td>
<td>-2.502526</td>
<td>0.0128</td>
</tr>
<tr>
<td>SRETt-1</td>
<td>-1.0078</td>
<td>0.653602-</td>
<td>0.05138</td>
</tr>
<tr>
<td>RETt-1</td>
<td>6.406</td>
<td>4.5678</td>
<td>0.0001</td>
</tr>
<tr>
<td>DACt-1</td>
<td>0.0867</td>
<td>1.9992</td>
<td>0.04625</td>
</tr>
<tr>
<td>REMt-1</td>
<td>0.0543</td>
<td>2.1345</td>
<td>0.0333</td>
</tr>
<tr>
<td>Industry</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table 2 shows the effect of business strategy on crash risk. The coefficient value of business strategy (0.0459) with the p-value (0.0597) shows that business strategy is positively associated with the crash risk that confirms the H1. The reason behind this positive relationship is that investors are overly optimist about the prospect of firms following innovative business strategies. When these expectations are not met, this leads to a dip in stock prices which induce the manager of growth firms to stockpile the negative news in order to prolong this overvaluation. Another reason is that growth stocks react more in response to negative information which stimulates the manager to hoard the bad news which consequently escalates the crash risk. These results support the finding of Skinner and Sloan (2002) and Habib et al. (2018). Jia (2018) also confirmed this relationship by arguing that firms with high exploration intensity are linked with more stock price crash risk as the prospector firms have the higher failure to success ratio and less likely to disclose negative news about their innovation projects.

One interesting finding of control variables is the positive coefficient value of RET and the negative value of SRET. This shows that firms with superior financial performance and low stock return volatility are more exposed to crash risk. These results highlight that poor business performance, high stock volatility and continuation of poor stock performance are not necessarily the causes of crash risk. This shows that crashes in stock prices often occur after the stable and good stock performance. The coefficient value of MTB and size shows that high growth and large firms are more exposed to crash
risk. Leverage shows the statistically significant and negative relation with crash risk indicates that debt can be substituted as a monitoring mechanism to curb the managerial opportunism and reducing the crash risk (Dang, Lee, Liu, & Zeng, 2018). Positive coefficient value of discretionary accruals also shows that value-destroying earning management and opaque financial reporting enhance the crash risk (Hutton et al., 2009). The coefficient value of Turnt-1 also shows the positive relationship with crash risk, consistent with the earlier studies (e.g., Bhide, 1993; Chang, Chen, & Zolotoy, 2017; Coffee, 1991; Zhang, Arda, Lu, & Miao, 2018). Stock liquidity attracts institutional investors who are interested in short term gains by permitting them to exist at low cost. Firms having short horizon investors control and manage their earnings more aggressively in order to stockpile bad news which ultimately leads to crashes in prices of stock. These findings are inconsistent with the Bentley et al. (2017), and Bushee et al. (2010).

Table 3: Business Strategy and Overvalued Equity

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>T-statistics</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.53659</td>
<td>0.10622</td>
<td>0.9155</td>
</tr>
<tr>
<td>Strategyt-1</td>
<td>0.22231</td>
<td>2.3134</td>
<td>0.0212</td>
</tr>
<tr>
<td>Size t-1</td>
<td>0.03793</td>
<td>2.1543</td>
<td>0.02074</td>
</tr>
<tr>
<td>MTBt-1</td>
<td>0.09285</td>
<td>2.7666</td>
<td>0.0059</td>
</tr>
<tr>
<td>Leverage t-1</td>
<td>-2.20286</td>
<td>2.8625</td>
<td>0.0388</td>
</tr>
<tr>
<td>RETt-1</td>
<td>0.0566</td>
<td>1.7456</td>
<td>0.0767</td>
</tr>
<tr>
<td>SRETt-1</td>
<td>12.71189</td>
<td>3.19344</td>
<td>0.0034</td>
</tr>
<tr>
<td>DACt-1</td>
<td>0.0453</td>
<td>0.6736</td>
<td>0.0533</td>
</tr>
<tr>
<td>REMt-1</td>
<td>0.055</td>
<td>2.7918</td>
<td>0.0324</td>
</tr>
<tr>
<td>Industry</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table 3 shows the effect of business strategy on equity overvaluation. The coefficient value of strategy (0.2223) with p-value is 0.0212 reveals a positive and significant effect. This means firms with innovative business strategy are more expected to experience overvaluation. These results are in accordance with others (e.g., Alikani, Largani, Ebraimi, & Hasanpour, 2018; Arianwuri, Sutrisno, & Prihatiningtias, 2017; Habib et al., 2018). who found that when the growth firms do not meet the excessively optimistic expectations of investors about the growth stock, stock price of such growth firms takes dips which motivate the manager of firms following prospector business
strategy to hide the bad news in order to sustain the overvaluation.

Table 4: Equity Overvaluation, Business Strategy and Stock Price Crash Risk

<table>
<thead>
<tr>
<th>Variables</th>
<th>Prospector</th>
<th>Defender</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>coefficient</td>
<td>T statistics</td>
</tr>
<tr>
<td>Constant</td>
<td>0.03514</td>
<td>0.55508</td>
</tr>
<tr>
<td>Crash_{t-1}</td>
<td>-0.06629</td>
<td>-2.98294</td>
</tr>
<tr>
<td>TSE_{t-1}</td>
<td>0.19058</td>
<td>3.06953</td>
</tr>
<tr>
<td>Growth_{t-1}</td>
<td>0.19086</td>
<td>1.68571</td>
</tr>
<tr>
<td>Size_{t-1}</td>
<td>-0.05077</td>
<td>-2.81601</td>
</tr>
<tr>
<td>MTB_{t-1}</td>
<td>-0.00763</td>
<td>-1.12396</td>
</tr>
<tr>
<td>Turn_{t-1}</td>
<td>0.02619</td>
<td>1.37515</td>
</tr>
<tr>
<td>Leverage_{t-1}</td>
<td>-0.24938</td>
<td>-3.40928</td>
</tr>
<tr>
<td>SRET_{t-1}</td>
<td>0.12892</td>
<td>2.22274</td>
</tr>
<tr>
<td>RET_{t-1}</td>
<td>9.823</td>
<td>1.8234</td>
</tr>
<tr>
<td>DAC_{t-1}</td>
<td>0.0765</td>
<td>2.076</td>
</tr>
<tr>
<td>REM_{t-1}</td>
<td>0.0654</td>
<td>2.013</td>
</tr>
<tr>
<td>Industry</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>years</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>

Table 4 shows the results of the effect of equity overvaluation on crash risk by dividing the firms into two groups such as prospector and defender. The Coefficient value (0.1905) of total sector error (TSE_{t-1}) with the p-value (0.01722) is positive and significant for prospectors while the Coefficient value (-0.1503) of Total sector error (TSE_{t-1}) with a p-value (0.1222) is negative and insignificant for defenders. This shows that firms pursuing innovative business strategies are very likely to experience the equity overvaluation that consequently leads to crash risk. These results support the findings of previous studies (e.g., Arianwuri et al., 2017; Baker & Wurgler, 2006; Bergman & Roychowdhury, 2008; Hajiha & Navi, 2018; Jin & Myers, 2006; Khurana, Pereira, & Zhang, 2018; Kothari, Shu, & Wysocki, 2009; Risso, 2008) and confirm the H2.

The reason behind this positive relationship is that investors have an overly optimistic expectation about the outlook of growth firms. Returns of these growth firms are unevenly concentrated on earnings announcement and this concentration suggests that information in stock prices contains systematic errors following the predictable surprises on the announcement of earning. As a result, managers intentionally withhold negative information to sustain this overvaluation. This opaque financial reporting damages the ability of capital markets to incorporate the firm-specific information increasingly into
the stock price. Since the negative information continues to pile up, hereafter it will become difficult to hide this information from investors and a time comes when it is released to market at once and as a result, it causes the crashes in firm's stock prices.

5. CONCLUSION

Due to its non-diversifiable nature, stock price crash risk has become an important element in stock income for the investor. Because of its importance, it is not out of the blue to find an improving body of literary works discovering the possible antecedents of crash risk. Financial disclosure measured by real earning management and accruals, past stock return and instability in stock returns are found to describe the fluctuation in crash risk. By analyzing the degree to which companies engage in specific business strategies are less or more vulnerable to the risk of a crash, we provide verification that enhances our comprehension about the fundamental elements of crash risk of the share price.

We utilize the Miles et al. (1978) strategy framework that emphasizes the firm’s rate of change about its markets and products. We claim that negative earnings surprises of firms pursuing innovative strategies create an asymmetrical market response which persuades the manager to stockpile the bad news that accelerates the risk of a crash in the future. Our results demonstrate that companies having low and high strategy score are less and more likely to experience crash risk. It is also discovered that companies implementing prospector strategies are very likely to undergo overvaluation and the combination of these two factors further raises the risk of a crash in the future.

The current study contributes to literary works on both business strategies and crashes risk. We expand the crash risk literary work by representing that company strategy are one of the significant aspects of crash risk. Such understanding would assist the traders in allocating their investments vigilantly among different companies with diverse strategies. In addition, we also add to the corporate strategy literary works by providing evidence that these strategies have greater repercussion as it can influence the possibility of firm-level risk of share price crash by changing the time of disclosure.

5.1. Limitations of the Study
Due to time constraints, this study used only discrete Strategy score measure for business strategy measurement whereas robust measures and analysis could also be used for comprehensive results. Moreover, longer periods of data can also be taken for more reliable results as this study has collected the 9 years data from 2008 to 2016.

5.2. Directions for Future research

Future researchers can investigate the effect of macroeconomic conditions on stock price crash risk. Corporate governance is an important area to be regressed with stock price crash risk by future researchers.

REFERENCES


Bentley, K., Newton, N. J., & Thompson, A. (2016). Business strategy and internal control over financial reporting. Available at SSRN 2637688.


