

Business Resilience During Crises: A Comparative Study Between Pn17 And 50 Ftse Bursa Malaysia KLCI Constituent Companies

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ABSTRACT

This was an event study that employed a non-parametric analysis using STATA. Data from 50 companies listed under Bursa Malaysia (BM), which consist of 21 companies classified under PN17 and 36 companies from the constituents top 50 FTSE at BM, were collected for five years (2018-2022). Using the Altman Z-Score, PN17 and T50FTSE companies were clustered under safe, grey, and distress zones. Besides, the study also aimed to examine the roles of a robust risk management system in managing a crisis among PN17 and the top 50 FTSE companies. The survey results revealed the significance of having an integrated and unified risk management for every company to ensure business continuity and resist crises. The study exposed the likelihood of managers manipulating the earnings figure during the pandemic and the significant positive relationship between the Operational Resiliency Framework (ORF) and Altman's Z-Score. A less robust risk management system makes a corporation more likely to fall into the distress zone category.

Keywords: Business Resilience, Insolvency, Z-Score, EM, Pandemics, Risk

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INTRODUCTION

The COVID-19 pandemic was a global crisis that significantly impacted Malaysia's health, social structures, and economy. Restrictions imposed during the Movement Control Order forced the closure of many businesses, causing severe financial struggles and insolvency. There were reportedly 37,415 Malaysian business closures during the Covid-19 pandemic, with SMEs accounting for 28,745 cases (Rashid, Yusoff, & Kamarudin, 2022). Studies were recommended to be conducted to identify contributing variables and offer remedies to strengthen the resiliency of business entities against possible threats (Generali, 2024), as they contributed substantially to the nation's economic growth (Fadzil, 2022; Shaharuddin, 2021).

Recent studies tend to focus on resilience in response to business-related disasters which caused many companies to become insolvent. A PricewaterhouseCoopers (PwC) survey in 2023 reported that 93% of Malaysian business organisations faced operational disruption in the preceding two years and respondents indicated resilience as an important strategic organisational priority (PwC, 2023). Organisations that exhibit high resilience are characterised by their increased adaptability (Webb & Schlemmer, 2006; Lopes, Gomes, & Mane, 2022), ability to react quickly to unanticipated changes, and skill in seizing opportunities (Mirjana, 2023; Fathi, Yousef, Vatanpour, & Peiravian, 2021). Businesses without an operational resiliency framework (ORF) or financial stability before a crisis experienced greater difficulties (Deloitte, 2021; PWC, 2020). A robust foundational framework was crucial for survival during economic crises.

Financial distress is a company's inability to meet its short-term financial obligations, often used interchangeably with insolvency, which indicates its failure. According to Khaliq et al. (2014), Bursa reported that 21 firms were classified as Practice Note No. 17 (PN17) entities, accounting for 2.32% of the 907 listed as of June 30, 2017. As of January 31, 2021, the number of PN17-designated companies rose to 23, constituting 2.67% of 900 entities, a 9.5% increase (Bursa, 2021). Companies that are publicly traded can be classified under PN17 status if their shareholders' funds fall to or below 25% of their total issued and paid-up capital (Bursa, 2021). To prevent delisting, PN17 enterprises are required to submit a strategic recovery plan that adheres to BM's listing criteria. In the past, legal

bankruptcy was adopted as a response variable for fiscal difficulties in many previous distress studies (e.g., Altman, 1968; Ohlson, 1980; Casey and Bartczak, 1984) for evaluating the usefulness of accounting data (Aziz and Lawson, 2013). For this study, the Altman Z-score Model was used to identify companies that were in danger of being classified as PN17. The KLCI is an internationally accepted index computation technique. The Top 50 FTSE BM KLCI includes the top 30 businesses on the Main Board and 20 Mid-Index in terms of total market capitalisation, which makes up 50 companies (excluding banks and insurance companies).

Previous literature explored the ORF in several sectors such as enterprise cyber security (Chang, Ramachandran, Yao, Kuo, & Li, 2016; Al-Turkistani, Aldobaian, & Latif, 2021), manufacturing enterprises (Thomas A., Pham, Francis, & Fisher, 2015; Thomas, Byard, Francis, Fisher, & White, 2016), small businesses (Gorjian, Zahra, & Ali A, 2021), IT Service Organisations (Bhamidipaty, Lotlikar, & Banavar.G., 2007), supply chain management (Pankaj, 2019), and many others. Due to the necessity and desire for business continuity, a system to safeguard a firm from any unanticipated disaster or disruption must be put in place. In Malaysia, because of the study, a business continuity management (BCM) model was developed (Bakar, Yaacob, & Udin, 2015). An investigation used the nine dimensions of Ernst & Young's Resiliency Framework, which proxied enterprise risk management as business continuity and resilience (Assibi, 2022). Salamzadeh et. al., (2023) concluded that corporate resilience consists of three stages: resilience awareness, adaptation and action, and growth (Bachtiar, Setiawan, Prastyan, & Kijkasiwat, 2023). This study was not intended to develop an ORF but used risk management as one of the proxies for ORF. The authors believed that ORF should be viewed holistically, and risk management was measured in this study as one of its components.

This study used (1) the Altman Z-score Model to analyse PN17 and the top 50 listed companies, and (2) risk management as a proxy to resilience to crisis (ORF). The study aimed to (1) investigate or validate whether an organisation needs ORF to be crisis-proof, (2) assess the performance of PN17 business entities using the Altman Z-score prior to the pandemic, (3) assess the Altman Z-score of all Top 50 firms in Malaysia, and (4) investigate the connection between ORF and PN17, i.e., the companies with the lowest Altman Z-score. The COVID-19 outbreak caused 99,696 job losses in

Malaysia (Surendan, 2021), and an increase in company closures (Rashid, Yusoff, & Kamarudin, 2022). COVID-19 impacted psychological well-being and mental health, causing stress, anxiety (Qui et al., 2020; Yong & Sia, 2023), and depression (Azuddin & Zakaria, 2020). If nothing is done to address this phenomenon, it would not only create societal issues but also fiscal issues for the country as a whole. Hence, it is significantly important to evaluate companies' performance by comparing the PN17 companies with the top 50 companies and banks listed on BM before and during the crisis. Firstly, it is likely to provide insights on and validation of the need of having either an ORF or at least a risk management system in place. Secondly, the results of this study could add value for future research in enhancing the development of ORF. Thirdly, to confirm that, having large market capitalisation is one of the factors that could ensure the company's survival especially during a crisis. Fourthly, the study's findings might be useful for relevant government ministries or agencies to gain a better understanding of businesses survival capability so that they may be able to create and execute a more effective and efficient economic stimulus package in future if the need arises.

LITERATURE REVIEW

Operational Resiliency Framework (ORF)

Resilience is defined as the ability to plan for, absorb, respond to, and recover from calamities, as well as adapt to new circumstances (Mirjana, 2023; Fathi, Yousef, Vatanpour, & Peiravian, 2021). Holling (1973), suggested one of the first definitions of resilience, which Angeler & Allen (2016), defined as the amount of disruption that a system can withstand before migrating into an alternate stable state. Business resilience is a notion that extends beyond business continuity, it assists to enhance a company's immune system, allowing it to resist difficulties, ward off disease, and recover more quickly (PWC, 2020). According to McKinsey & Company, detecting potential new risks and holes in controls, establishing risk appetite, and deciding on the right risk-management technique are the three basic functions of dynamic risk management (Ritesh, Fritz, Thomas, & Olivia, 2020). A thorough and systematic method that empowers small enterprises to respond to environmental shocks like the COVID-19 outbreak effectively

and appropriately is critical (Khanzad & Gooyabadi, 2021). Business resiliency according to Al-Turkistani, Aldobaian, & Latif (2021) includes the ability to survive cyber-attacks, where the system resiliency approach should address how to cope with the consequences of cybersecurity risks. The study of operational resilience frameworks, which encompasses retooling, repurposing, recalibrating, and reconfiguring, could assist decision-makers to improve the resilience of supply chains and capacities when confronted with a crisis such as COVID-19 (Dwaikat, Zighan, Abualqumboz, & Alkalha, 2022). Findings from another study revealed that in mitigating risks arising from COVID-19 that there was a need of alignment and coordination among supply chain partners, as well as the risk management methodology (Aly, Galal, & Ayman, 2022). Therefore, the key to protecting against the negative impact of any disruption due to business calamities is to have management initiatives to build operational resilience framework. These initiatives include the analysis of: (1) implications of risks, (2) probability that risks may occur, and (3) the level of acceptance of the risk of disruption of product or service delivery in ensuring the business remains as a going concern. Businesses that do not have an operational resiliency framework (ORF) or were experiencing financial instability prior to the crisis were the most affected by the disruption. In other words, companies who had the insight to anticipate future risks and took a proactive and holistic strategy to building resilience were in a better position to endure the impact of the crisis (Deloitte, 2021).

H₁: Companies with ORF are more capable to withstand an economic crisis than those without ORF

H₀: Both companies with and without ORF are unable to withstand an economic crisis.

Insolvency and ORF

Financial distress or insolvency can be defined in three ways (Pastena & Ruland, 1986): (1) as a state of negative net worth, (2) as an inability to pay debts as they become due (insolvency), and (3) as a legal definition in which a company continues to operate or liquidates under court supervision (legal bankruptcy). As a result, all three situations are seen as proxies for financial distress. Thus, the inability to pay liabilities when they are due, is

described in theoretical models as financial distress (Scott, 1981; Bahnson & Bartley, 1992). This study adopted PN17 companies as a proxy to companies in financial distress. Research in the field of financial distress that focused on prediction and development of measuring tools were professionally researched and saturated. However, an attempt to examine the link between ORF and financial distress has received less attention. With the market becoming more competitive and unpredictable because of globalisation, technology, and a constant stream of breaking news, it is crucial for businesses to be able to comprehend and prepare for severe events.

Many attempts were made to create a legal framework for example: to combat insolvency (Olujobi, 2021), early crisis suppression (Waxman & Annamalai, 1999), and response to failure (Caprio & Klingebiel, 1996). There has been an attempt to create a framework for operational resilience in manufacturing companies, but it was mostly strategic and not at an operational level (Thomas., Pham, Francis, & Fisher, 2015). Another study explored why small businesses were affected by COVID-19 with the goal of assisting researchers to develop a strategic resilience framework (Gorjian Khanzad & Gooyabadi, 2021). The ability to manage new risks, anticipate interconnections between diverse forms of risk, and recover from disruption will be a competitive differentiator for organisations and countries alike in the twenty-first century (Opstal, 2009). Therefore, this study did not attempt to form an opinion on the adoption of existing resiliency framework, however, the main purpose of the study was to investigate or validate whether an organisation needs an ORF to be crisis-proof.

H₂: The Likelihood of companies without ORF fall into the fiscal crisis territory is great.

Impact of Pandemic to Financial Ratios

Various studies have examined the effects of earnings management practices on financial ratios, using profit as one of the indicators to measure financial ratios (Aljughaiman, Nguyen, Trinh, & Du, 2023). However, only a few research studies have begun examining the effects of COVID-19 on earnings management, particularly the misrepresentation of financial ratios that use earnings as a basis for calculation. The Agency Theory outlines the interaction between agents and principals; agents frequently

have more information about a situation than their principals. In such a circumstance, agents have incentives to act opportunistically, which leads to concerns that may be categorised as adverse selection and moral hazard. Various studies survey earnings management practices during the global financial and oil crises., However, recent studies have started exploring the impact of Covid-19 on earnings management, especially practices that lead to misrepresentation of financial ratios that use earnings as a basis for calculating the ratios. A study in China using 1832 listed firms found that firms were more inclined to manage earnings during the pandemic (Aljughaiman, Nguyen, Trinh, & Du, 2023). Financially troubled businesses typically handle their incomes during the COVID-19 crisis by adopting the accrual accounting technique. On the other hand, the company tends to overlook subpar performance during challenging times to justify the losses caused by its earlier subpar management practices (Liu & Sun, 2022). By doing so, it might be possible to hide the subpar performance leading to the manager's termination. Hence, based on the above explanation, when financial ratios are calculated using profit, earnings data can be manipulated to achieve favourable financial ratios.

Although comparative studies between PN17 companies and the top 50 FTSE Bursa Malaysia KLCI Index constituent companies have provided valuable insights into business resilience to crises, several research gaps still need to be addressed. Firstly, existing studies often focussed solely on financial indicators or stock performance as resilience measures, neglecting other crucial aspects such as operational resilience, supply chain resilience, and employee resilience. Future research should consider additional dimensions of resilience. Additionally, there is a lack of studies examining the role of organisational culture in shaping resilience among PN17 and FTSE companies. Understanding how cultural factors influence resilience could provide valuable insights to organisations seeking to enhance their resilience strategies. Thirdly, research is needed to examine how companies within the same industry or sector can enhance their resilience. Existing studies compare resilience between different types of companies, but focusing on companies within the same industry or sector is important. This could involve studying best practices and strategies employed by resilient companies within a specific industry. Addressing these research gaps could enhance our understanding of business resilience to crises and offer practical insights for organisations seeking to improve their resilience strategies.

METHODOLOGY

The PN17 companies were derived from the list issued by BM on companies classified under PN17 as of 5 September 2022 (Bursa, 2021). There were 26 companies classified under PN17 out of the total 902 companies listed on the Main Market of BM. Top 50 (T50FTSE) companies were extracted FTSE BM KLCI (which comprised 30 companies) and the FTSE BM Mid 70 Index via <https://www.bursamalaysia.com>. 21 companies out of 30 businesses on the main board (FTSE BM KLCI) were considered as a sample of the population after filtering banks, insurance, and gambling companies. The balance was selected from the top 70 Mid-Index on BM EMAS Index. Each company's time series data were collected from the company annual report for five (5) years. Two years (2) before Covid-19 hit the Malaysian market (2018 to 2019) and three years (3) during and after the Covid-19 pandemic (2020 to 2022). A total of 78 companies were thus selected, including 21 PN17 companies and 57 from the T50FTSE index constituent companies.

We developed two main financial distress models using data gathered from BM PN17 and T50FTSE companies. Each model was tested two times (before and during Covid-19) using time series data. The first and second models used the financial distress (Z-score) under Practice Note No. 17 (PN17) to represent companies with and without ORF before, during and after the Covid-19 outbreak. The third and fourth models utilised the financial distress (Z-score) of the top 50 companies with and without ORF before, during and after the Covid-19 pandemic. The extent of an entity's economic difficulty is assessed using the popular and well-known Altman Z-score model (Sena & Williams, 1998; Fai, Siew, & Hoe, 2022). Where, $x_1 = WC/TA$, $x_2 = RE/TA$, $x_3 = EBIT/TA$, $x_4 = MVE/TL$, and $x_5 = SAL/TA$.

$$Z = 1.2x_1 + 1.4x_2 + 3.3x_3 + 0.6x_4 + x_5$$

(WC= working capital, TA= total assets, RE= retained earnings, EBIT= earnings before interest and taxes, MVE = market value of equity, TL= total liabilities, SAL= sales)

Financial Distress Models:

Z Distress = 0	PN17 before Covid-19 outbreak
Z Distress =1	PN17 during Covid-19 outbreak
Z Distress = 0	T50FTSE before Covid-19 outbreak
Z Distress =1	T50FTSE during Covid-19 outbreak

Z-scores were higher than 2.99, suggesting that the businesses were stable financially. Businesses that fell into the financial crisis territory had a Z-score below 1.81. A Z-score between 1.81 and 2.99 suggested that the companies were in the grey zone. All variables were computed using data from the companies' annual report. To evaluate the resilience to crisis of healthy (T50FTSE) and unhealthy (PN17) companies during the Covid-19 pandemic and as a validation of the need of having an ORF. ORF was measured by using dichotomous method where "1" represented "YES", whilst "0" represented "NO" for each element of the ORF. ORF was measured by examining whether the company hadg all the components of risks i.e., (1) Analysis of implications of risks, (2) Evaluation of probability of risk occurring, and (3) Evaluation of risk retention which is the consideration of the acceptance of the risk of disruption of the production or service delivery. (4) The remarks by external auditors (negative or positive) were taken into consideration, where "1" represented positive remarks whilst "0" represented negative remarks or no remarks could be located. Company with an ORF score equal to 0.75 and 1 ($0.75 \leq \text{ORF} < 1$) was classified as good or having all risk components in place. A score between 0.74 and 5 ($0.74 \leq \text{ORF} \leq 5$) was satisfactory where some risk components were not in place. In contrast, a score less than 5 ($\text{ORF} < 5$) was unsatisfactory where the company had more than two components of risk missing or a company had a statement of risk in the annual report to fulfil the stock exchange's listing requirements. A perfect score of 1 did not mean the company had an excellent resilience framework. ORF served as a proxy for a risk management framework inside the organisation. It did not refer to the system's efficacy or efficiency.

RESULTS AND DISCUSSION

As shown in Table 1, there were 376 observations. The mean for the financial ratios RETA, $\bar{x} = 1.13$ (SD = 0.31), EBITTA, $\bar{x} = 1.12$ (SD = 0.03) and SALTA, $\bar{x} = 0.94$ (SD = 0.28) was greater for PN17 firms than for T50FTSE companies, apart from WCTA, $\bar{x} = -0.08$ (SD = 0.2), and MVETL, $\bar{x} = -0.86$ (SD = 53). As for T50FTSE companies, the mean for the financial ratios WCTA and MVETL were both positive at $\bar{x} = 0.05$ (SD = 0.11) and $\bar{x} = 0.53$ (SD = 0.66) respectively. These reflected PN17 enterprises having negative working capital and negative market value equity, which had resulted in their classification as PN17. Conversely, the mean for financial ratios RETA, EBITTA, and SALTA for PN17 was greater than for T50FTSE in aggregate. This was hardly surprising given that a company in trouble may strive to alter sales and earnings figures. This is consistent with the literature study that supports the manager’s propensity to falsify earnings figures when times are tough. A low standard deviation suggested that the data points typically tended to be near to the data set mean. Except for two variables, WCTA of PN17 and SALTA of T50FTSE, which were negatively skewed, all variables had a positive rightward skew. Both skewness and kurtosis lay within the permissible ranges of 3 and +3 and 10 to +10, respectively.

Table 1: An Aggregate Financial Ratio for PN17 and T50FTSE Companies

Variable	Freq.	Mean	Std.Dev.	Skewness	Kurtosis	Median	Min	Max
PN17								
WCTA	112	(0.08)	0.20	(1.19)	5.29	(0.03)	(0.78)	0.36
RETA	112	1.13	0.31	1.98	7.45	1.06	0.69	2.30
EBITTA	112	0.12	0.03	2.22	8.24	0.11	0.08	0.24
MVETL	112	(0.86)	0.53	0.14	2.61	(0.87)	(2.11)	0.46
SALTA	112	0.94	0.28	2.10	8.69	0.87	0.43	2.13
T50FTSE								
WCTA	264	0.05	0.11	0.81	3.28	0.02	(0.21)	0.36
RETA	264	0.94	0.10	0.93	8.14	0.94	0.55	1.32
EBITTA	264	0.10	0.01	0.86	4.50	0.10	0.08	0.12
MVETL	264	0.53	0.66	0.59	4.64	0.55	0.95	2.90
SALTA	264	0.91	0.08	(0.41)	4.15	0.90	0.57	1.12

The descriptive statistics included in Tables 2 and 3 illustrate the results of the pandemic’s impact on PN17 and T50FTSE enterprises during the Pre

and Post Covid periods. For T50FTSE firms, all financial ratios — WCTA (0.04 to 0.05), RETA (0.93 to 0.94), MVETL (0.51 to 0.55), and SALTA (0.90 to 0.91)—were greater in the post-Covid period than they were in the pre-Covid period, except for EBITTA which remained at 0.1. This indicated that T50FTSE companies were able to become more resilient after the Covid-19 crisis. Greater average financial ratios (WCTA) for T50FTSE large enterprises demonstrated how these significant organisations could assess risks while mitigating them, for instance by reorganising budgets or adopting conservative or ethical expenditure practices in the face of uncertainty. Thus, T50FTSE firms' flexibility and capacity to adapt and change themselves during a crisis enhanced their resistance level.

Table 2: Pre-Covid Descriptive Statistics for PN17 and T50FTSE Companies

Variable	Freq.	Mean	Std.Dev.	Skewness	Kurtosis	Median	Min	Max
PN17								
WCTA	45	(0.03)	0.17	(0.01)	2.99	(0.01)	(0.39)	(0.39)
RETA	45	1.07	0.31	1.95	7.20	1.02	0.69	0.69
EBITTA	45	0.12	0.03	2.24	8.23	0.11	0.08	0.08
MVETL	45	(0.72)	0.57	0.14	2.26	(0.64)	1.76	1.76
SALTA	45	0.95	0.28	2.67	9.96	0.88	0.71	0.71
T50FTSE								
WCTA	105	0.04	0.11	0.75	3.38	0.02	(0.21)	(0.21)
RETA	105	0.93	0.11	1.03	6.51	0.93	0.69	0.69
EBITTA	105	0.10	0.01	0.76	4.15	0.10	0.08	0.08
MVETL	105	0.51	0.71	0.52	4.22	0.52	0.95	0.95
SALTA	105	0.90	0.09	(0.51)	4.02	0.91	0.57	0.57

**Table 3: Post-Covid Descriptive Statistics
for PN17 and T50FTSE companies**

Variable	Freq.	Mean	Std.Dev.	Skewness	Kurtosis	Median	Min	Max
PN17								
WCTA	67	(0.10)	0.21	(1.54)	5.10	(0.04)	(0.78)	(0.78)
RETA	67	1.17	0.32	2.07	7.76	1.10	0.71	0.71
EBITTA	67	0.12	0.03	2.20	8.12	0.11	0.08	0.08
MVETL	67	(0.95)	0.48	(0.09)	2.50	(0.98)	(2.11)	(2.11)
SALTA	67	0.92	0.28	1.75	7.81	0.87	0.43	0.43
T50FTSE								
WCTA	159	0.05	0.11	0.85	3.20	0.03	(0.13)	(0.13)
RETA	159	0.94	0.10	0.85	9.64	0.94	0.55	0.55
EBITTA	159	0.10	0.01	0.91	4.63	0.10	0.09	0.09
MVETL	159	0.55	0.64	0.67	4.97	0.56	0.81	0.81
SALTA	159	0.91	0.07	(0.17)	3.64	0.90	0.68	0.68

Statistics in Tables 2 and 3 show that PN17's financial ratios, WCTA, MVETL and SALTA, were lower during Post-Covid because of the absence of flexibility in responding to shifting risk exposures. The results clearly showed that companies classified as PN17 by the Bursa categorisation had higher reported profitability during pre and post pandemics as reported by the increase of RETA and EBITTA Post-Covid compared to Pre-Covid. Though some conclusions may be drawn from the descriptive statistics, other factors may have contributed to the observed findings of this study, and these should be considered by future researchers. Data was examined for accuracy of data entry and missing values before the assumptions test. A normality test was conducted before further analysis to determine whether the data should use a parametric or non-parametric test. The Shapiro-Wilk normality test for all variables yielded a p -value of 0.00 ($p = 0.0000$). This suggested that the normal distribution assumptions were violated. The skewness and kurtosis report shown in Table 1 below provides evidence that the data was not normally distributed. Apart from that, additional normality tests such as the histogram, P-P plot, and Q-Q plot revealed that data normality distribution was violated. Since the data were not normally distributed, the mean and median financial ratios between the two groups were statistically compared using the non-parametric Kruskal-Wallis and Mann-Whitney tests. The results of the non-parametric Kruskal-Wallis and Mann-Whitney tests are found in Table 4 below. In Kruskal-Wallis mean test, the p -value was the probability that the differences in observed means were only due to random causes. Results from Pre- and Post-Covid showed that the p -value was less than 0.05, indicating that it was unlikely that the differences were the result of pure randomness. Statistical significance was defined as a p -value of less than 0.05. ($p < 0.05$). A value that differed more significantly across populations was indicated by a lower p -value. The decision was made to reject the null hypothesis because the p -value was below the significance level. Besides, Bartlett's statistical test for equal variances between groups revealed a Chi-Square test was significant ($p < .05$), which led to rejecting the null hypothesis and assuming that variances were uneven between groups.

Table 4: Result of Covariance Test Across Category (group)

By Category	Kruskal-Wallis		Mann-Whitney		Bartlett's equal Variance	
	Chi2	P-value	Z-value	P-value	Chi2	P-value
Combined	169.715	0.0001	17.258	0.0000	188.478	0.0000
Pre Covid	70.269	0.0001				
Post Covid	99.018	0.0001				

Test for multivariate normality, Doornik-Hansen where $\chi^2(10) = 419.558$, Prob (χ^2) = 0.0000 implied that the p -value was less than the significance level, and the decision was to reject the null hypothesis and conclude that the data didnot follow a normal distribution. The correlation coefficient was computed by taking the covariance of the variables and multiplying it by the sum of their standard deviations. Lawley test of equality variance ($\chi^2(9) = 1104.89$, prob $> \chi^2 = 0.000$) demonstrated that the correlation matrix compound was symmetric or all correlation were equal. The Hotelling test, $T^2 = 16143.09$ ($F(4,372) = 4003.49$; Prob $> F = 0.000$) was significant at a p -value of less than 0.05 ($p = 0.05$), which indicated that the mean differed from the value of the hypothesis. All variables were correlated with each other. The Pearson correlation coefficient tests are shown in Table 5. The correlation between WCTA and RETA was -0.6015 whilst the correlation between WCTA and SALTA was (-0.3402). This indicated that WCTA was mediumly negatively correlated with RETA and WCTA was lowly negatively correlated with SALTA. Lowly negatively correlation was also found between RETA and MVETL (-0.3295), and between MVETL with EBITTA (-0.3733). There was a strong positive correlation between RETA and EBITTA (0.8831).

Table 5: Pearson Correlation Coefficient between Variables

	WCTA	RETA	EBBITA	MVETL	SALTA
WCTA	1.0000				
RETA	-0.6015	1.0000			
EBITTA	-0.5701	0.8831	1.0000		
MVETL	0.4288	-0.3295	-0.3733	1.0000	
SALTA	-0.3402	0.6133	0.6585	0.0356	1.0000

Obs. = 376

A two-way ANOVA revealed that there was a statistically significant interaction between ORF and category of companies ($F(1, 374) = 837.04$, $p < .000$). As a result, there was evidence that the financial ratios varied

by category. Furthermore, the diversity in financial ratios appeared to be cross-category and cross-classification. Simple regression between ORF and Altman Z-Score was conducted to determine the relationship between the two variables. Outcomes disclosed that there was a significant positive relationship between the two variables which reflected that the degree of risks management (ORF) taken by the company ensured that the company was safe and able to resist business and economics calamity. Pre-Covid (refer to Table 6a in appendix I), 43.64% (24) of T50FTSE companies had a positive Altman Z-Score MVETL of above 2.99 with the highest score of 4.89. The balance of 56.36% (31) T50FTSE companies had a positive Altman Z-Score between 2.99 and 1.83. This implied that pre-Covid, 43.4% (23) of T50FTSE companies were under the safe zone of being insolvent while 56.6% (30) of FTSE companies were under grey zone in accordance to Altman Z-Score. Post-Covid (refer to Table 6b in appendix II), data demonstrated 49.09% (27) of T50FTSE companies had an Altman Z-Score above 2.99 that was under safe zone or a stable financial position. Whilst 50.91% (28) of T50FTSE companies had an Altman Z-Score of between equal to 2.99 and greater than 1.81 ($1.81 \leq \text{Z-Score} \leq 2.99$) that was under grey zone. None of the T50FTSE companies Z-Score were below 1.81 or under financial crisis territory and none were determined to be heading towards bankruptcy.

Most companies with a Z-Score above 3 had positive for all variables except for variable WCTA (working capital to total assets). The number increased from five (5) of T50FTSE companies during pre-Covid to seven (7) companies during Post-Covid that had a negative WCTA. This implied that Covid-19 had an impact on the working capital of a few T50FTSE companies. The Pecking Order Theory states that a company should prefer to finance itself first internally through retained earnings. If this source of financing is unavailable, a company should then finance itself through debt. Finally, and as a last resort, a company should finance itself through the issuing of new equity. During Pre Covid, all companies had a negative MVETL ratio except for three companies (company id 5099, 5238 & 5279) which had a positive MVETL. However, the post-Covid data revealed that every company had a negative MVETL. The negative MVETL ratio had a significant discriminating power that was skewed toward the likelihood of bankruptcy. Except for three organisations with id numbers 5099, 5238, and 7251, all ORF scores during Pre and Post Covid were below one ($\text{ORF} < 1$).

As for Z-score, the number of enterprises with Z-scores were lower than 1.81 ($Z < 1.81$) increased from six to seven during Pre Covid and Post Covid respectively. Except for three companies with Z-scores of more than 2.99 ($Z\text{-score} > 2.99$), most of the companies had Z-scores of between 1.81 and 2.99 ($1.81 \leq \text{Altman } Z\text{-score} \leq 2.99$).

Table 6: Hypothesis and Conclusion Based on Statistical Findings

Hypothesis	Conclusion
H_1 Companies with ORF are more capable to withstand economic crisis than those without ORF	Supported
H_0 Both companies with and without ORF are unable to withstand the economic crisis.	Supported
H_2 Likelihood of companies without ORF fall into the fiscal crisis territory is great.	Supported

CONCLUSION

The findings from this study highlight the need to have an integrated risk management strategy to safeguard businesses from the adverse effects of disruptions because of economic tragic events, as noted by Dwaikat et al., (2022) and Aly, Galal, & Ayman, (2022). The findings demonstrate behavioural finance (moral hazard) among agents’ tendency to manipulate earnings figures to their benefit. Risks are typically seen as an integral component of corporate governance by many. A lack of fit corporate governance exposed firms to danger, jeopardising the company’s brand and causing financial loss. Many corporate failures in the past were caused by accounting figure manipulation, such as the cases of Enron, World.com, Parmalat, and Author Andersen, to mention a few. Aside from economic dangers, several firms operating within the World Trade Center after the September 11 attacks were unable to operate immediately due to data loss. During the Covid-19 pandemic, many businesses could not survive or continue to exist because they lacked the capacity and aptitude to continue doing so. The findings from this study showed solid evidence that risk management, a proxy for ORF, had a significant influence in ensuring a company’s existence. Risk management should not be seen just a mere requirement to meet listing requirements but it should be carefully conducted to enhance the resilience of companies to adapt to and survive adversity – both foreseeable and unforeseeable – that is part and parcel of running a business. Therefore, as a conclusion, the findings were consistent with

prior research on the significance of risk management and other facts that might help organisations achieve sustainability. However, risk analysis focuses on commercial risks rather than uncontrollable risks by business. To provide corporate resilience against any hazard, an ORF that includes a sinking fund should be developed to mitigate risk beyond the company's control is recommended.

DIRECTION FOR FUTURE RESEARCH

Future research into business resilience during crises could explore various avenues to deepen our understanding of the factors that contribute to organisational resilience. One potential direction is to conduct a longitudinal study that tracks the performance of PN17 companies and the top 50 FTSE Bursa Malaysia KLCI Index constituent companies over multiple crisis cycles. This could help identify patterns or strategies that consistently enhance resilience. Another possible direction is to conduct a qualitative study examining organisational culture, leadership styles, and strategic decision-making processes of resilient companies. This could provide valuable insights for theory and practice by uncovering how these factors influence resilience. Additionally, future research could investigate the role of technology and digitalisation in enhancing business resilience. Given the increasing reliance on technology in today's business landscape, understanding how companies can leverage technology to build resilience could be crucial. Overall, future research should aim to provide a more comprehensive and nuanced understanding of the factors that contribute to business resilience in crises, considering the specific context of PN17 companies and the top 50 FTSE Bursa Malaysia KLCI Index constituent companies.

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APPENDIX

Table 6: Table of T50FTSE Companies ORF and Z-score during Pre & Post-Covid

ID	WCTA		RETA		EBITTA		MVETL		SALTA		ORF		ZScore	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
128	0.01	0.04	0.94	0.94	0.10	0.10	0.65	0.45	0.93	0.89	1.00	1.00	2.98	2.86
166	0.14	0.04	0.94	0.95	0.10	0.10	0.69	0.79	0.87	0.88	0.88	1.00	3.08	3.06
1619	-0.03	0.05	0.90	0.96	0.09	0.10	0.06	0.72	0.80	0.79	1.00	1.00	2.36	2.95
1818	0.04	0.00	0.96	0.95	0.10	0.10	1.15	0.96	0.91	0.94	1.00	0.92	3.32	3.19
1961	0.02	0.03	0.92	0.95	0.10	0.11	0.42	0.96	0.92	0.92	1.00	1.00	2.82	3.21
2445	0.02	0.05	0.95	0.94	0.09	0.10	0.58	0.73	1.04	0.89	0.75	0.83	3.06	3.03
2771	-0.01	0.13	1.01	0.93	0.11	0.10	0.38	1.08	0.89	0.90	1.00	0.92	2.89	3.34
3182	0.14	0.04	0.94	0.95	0.10	0.10	0.69	0.65	0.87	0.88	0.88	0.92	3.08	2.95
3255	0.14	0.04	0.94	0.96	0.10	0.10	0.69	0.84	0.87	0.87	0.88	0.92	3.08	3.11
3395	0.02	0.00	1.27	0.93	0.11	0.10	0.46	1.32	0.95	1.00	1.00	1.00	3.41	3.43
3689	0.19	0.03	0.92	0.90	0.09	0.10	0.57	0.88	0.97	0.98	0.88	1.00	3.14	3.13
3816	-0.10	-0.05	0.95	0.92	0.10	0.09	1.32	0.14	0.95	0.86	1.00	1.00	3.29	2.48
4065	0.23	0.04	0.97	0.93	0.10	0.10	1.99	0.54	0.92	0.84	0.75	1.00	4.07	2.85
4065	0.02	0.07	0.95	0.95	0.09	0.10	0.58	0.36	1.04	0.93	0.75	1.00	3.06	2.89
4162	0.14	0.10	0.94	0.93	0.10	0.09	0.69	0.60	0.87	0.98	0.88	0.83	3.08	3.08
4197	0.14	0.10	0.94	0.93	0.10	0.10	0.69	0.41	0.87	0.88	0.88	1.00	3.08	2.88
4324	0.02	0.05	0.92	0.98	0.10	0.10	0.42	-0.07	0.92	0.92	1.00	0.92	2.82	2.64
4456	0.15	0.26	0.99	0.96	0.10	0.11	1.21	2.89	0.95	1.04	1.00	1.00	3.58	4.80
4707	0.09	0.15	0.89	1.02	0.10	0.12	0.25	0.45	0.93	0.92	1.00	1.00	2.77	3.19
4715	-0.11	0.00	0.91	1.28	0.10	0.11	0.23	0.67	0.88	0.95	1.00	1.00	2.49	3.51
4863	0.04	0.03	0.91	0.76	0.09	0.10	-0.62	0.44	0.80	0.86	1.00	0.75	2.04	2.54
5102	0.01	-0.09	0.93	0.91	0.10	0.10	0.17	0.29	0.87	0.88	1.00	1.00	2.60	2.54
5106	0.05	-0.09	0.98	0.95	0.09	0.10	0.96	0.03	0.87	0.80	1.00	1.00	3.19	2.38
5141	0.18	0.03	0.89	0.89	0.10	0.10	0.36	-0.41	0.92	0.90	1.00	1.00	2.93	2.28
5151	0.17	0.32	0.97	0.90	0.11	0.10	1.67	1.16	1.01	0.96	1.00	0.75	3.93	3.64
5168	-0.10	0.02	0.95	0.98	0.10	0.09	1.32	0.95	0.95	0.90	1.00	1.00	3.29	3.17
5183	0.15	-0.01	0.87	0.93	0.10	0.10	1.24	-0.29	0.94	0.89	0.75	1.00	3.41	2.34
5196	-0.02	0.04	0.93	1.04	0.10	0.11	0.44	-0.12	1.06	0.93	0.75	1.00	2.93	2.72
5199	0.28	-0.11	0.89	0.97	0.10	0.10	0.89	0.49	0.94	0.97	1.00	0.75	3.40	2.83
5209	0.08	0.07	0.84	0.92	0.10	0.09	0.18	-0.45	0.93	0.88	0.88	1.00	2.65	2.30
5210	-0.12	0.27	1.00	0.87	0.10	0.10	-0.12	1.20	0.92	0.96	1.00	1.00	2.44	3.56
5247	0.17	0.08	0.97	0.84	0.11	0.10	1.67	0.26	1.01	0.89	1.00	1.00	3.93	2.66
5248	-0.11	-0.06	0.91	0.93	0.10	0.10	0.23	-0.20	0.88	0.89	1.00	1.00	2.49	2.32
5254	-0.03	0.00	0.83	0.88	0.10	0.10	-0.38	-0.01	0.84	0.78	1.00	1.00	2.06	2.33
5273	0.06	-0.05	0.98	1.00	0.10	0.10	0.48	0.64	0.90	0.98	1.00	1.00	2.96	3.02
5285	0.28	0.21	0.89	0.93	0.10	0.11	0.89	0.44	0.94	0.94	1.00	1.00	3.40	3.10
5347	0.02	-0.05	1.12	1.28	0.11	0.10	0.40	0.94	0.94	0.92	1.00	1.00	3.15	3.55
5347	-0.10	0.02	0.95	0.95	0.10	0.09	1.32	0.53	0.95	0.92	1.00	0.75	3.29	2.90
5398	0.18	0.02	0.89	0.97	0.10	0.09	0.36	1.25	0.92	1.04	1.00	1.00	2.93	3.48
5681	-0.11	0.03	0.91	0.92	0.10	0.10	0.23	0.06	0.88	0.89	1.00	0.75	2.49	2.55

Table 7: PN17 Pre-& Post Covid Financial Ratio, ORF and ZScore

ID	WCTA		RETA		EBITTA		MVETL		SALTA		ORF		ZScore	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
45	0.04	-0.40	0.87	1.67	0.09	0.17	-0.59	-0.97	0.84	1.35	0.50	0.50	2.06	3.21
91	-0.05	-0.25	1.02	1.35	0.11	0.15	-0.35	-1.24	0.96	0.94	0.38	0.42	2.47	2.27
159	-0.11	-0.04	1.05	1.06	0.11	0.11	-0.99	-0.94	0.73	0.87	0.50	0.25	1.83	2.11
4847	-0.01	0.02	0.99	0.88	0.10	0.09	-0.86	-0.61	0.85	0.78	0.38	0.83	2.05	1.97
5099	0.12	-0.08	0.91	0.91	0.10	0.10	-0.24	-0.21	0.89	0.83	0.75	1.00	2.50	2.22
5175	0.02	0.03	0.92	0.92	0.10	0.10	-0.70	-0.69	0.89	0.74	0.50	0.67	2.10	1.97
5218	-0.01	0.06	0.99	1.22	0.10	0.12	-0.86	-0.91	0.85	0.74	0.38	0.25	2.05	2.36
5238	0.01	-0.21	0.93	1.14	0.10	0.12	-0.77	-1.22	0.86	0.83	0.50	0.75	2.06	1.84
5259	0.01	-0.32	0.93	1.41	0.10	0.14	-0.77	-0.74	0.86	1.34	0.50	0.33	2.06	2.96
5268	-0.05	-0.08	1.09	1.21	0.11	0.12	-0.83	-1.84	0.96	0.98	0.38	0.25	2.31	1.87
5279	0.12	-0.17	0.70	1.09	0.10	0.11	0.31	-1.31	0.88	0.82	0.25	0.50	2.51	1.74
5835	0.05	-0.17	1.00	1.09	0.11	0.11	-0.72	-1.31	0.81	0.82	0.50	0.50	2.19	1.74
6203	-0.01	-0.28	0.87	1.31	0.10	0.14	-0.34	-0.97	0.80	0.81	0.38	0.25	2.14	2.18
6548	0.01	0.00	1.01	1.10	0.11	0.11	-0.54	-1.39	0.80	0.75	0.50	0.25	2.25	1.84
7045	0.07	-0.03	0.92	1.07	0.11	0.11	-1.28	-1.39	0.88	0.95	0.25	0.50	1.86	1.96
7073	-0.04	0.00	1.02	1.01	0.11	0.10	-0.50	-0.77	0.84	0.78	0.50	0.50	2.27	2.06
7183	-0.05	-0.06	1.16	1.16	0.12	0.12	-1.16	-1.37	1.09	1.09	0.25	0.25	2.36	2.22
7195	-0.06	0.01	1.03	1.22	0.11	0.13	-1.18	-0.84	0.80	0.64	0.25	0.50	1.80	2.28
7251	0.26	0.14	1.08	1.11	0.11	0.12	-1.52	-1.21	0.88	0.87	1.00	1.00	2.17	2.26
8346	0.01	-0.06	1.01	1.05	0.11	0.11	-0.54	-0.46	0.80	0.89	0.50	0.25	2.25	2.36
8834	-0.05	0.01	1.02	0.97	0.11	0.11	-0.35	-0.27	0.96	0.84	0.38	0.25	2.47	2.39
8931	0.11	-0.16	0.92	1.21	0.11	0.13	-0.55	-0.64	0.88	1.13	0.25	0.50	2.32	2.68
9377	0.00	-0.26	1.01	1.43	0.11	0.14	-0.31	-0.89	0.83	0.91	0.38	0.25	2.42	2.54
9814	0.12	-0.39	0.70	1.55	0.10	0.16	0.31	-1.14	0.88	1.45	0.25	0.25	2.51	3.02