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A Multidimensional Approach to Bankruptcy Risk: The Impact of Accounting Conservatism, Business Strategies, Cash Flow Volatility, and Interest Coverage Ratios

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Abstract: The research objective was to test the impact of accounting conservatism, interest coverage ratio, cash flow volatility, and business strategy on the bankruptcy risk of the non-financial sector in Saudi Arabia. Quantitative data were collected from 2016 to 2024 of the listed non-financial companies in the Saudi Arabia Stock Exchange. Dynamic panel data approach employing STATA-15 Software. The dynamic panel data results show that accounting conservatism and cash flow volatility have negative and significant impacts on bankruptcy risk. While the business strategy has a positive and significant impact on bankruptcy risk. On the other hand, the interest coverage ratio has an insignificant impact on the bankruptcy risk of non-financial companies in Saudi Arabia. The findings with these results contributed to the extant literature by highlighting the dual role of accounting conservatism and cash flow volatility in reducing bankruptcy risk, while emphasizing the counterproductive influence of certain aggressive business strategies on financial stability. The study for the practitioners emphasized the importance of adopting conservative accounting practices and managing cash flow effectively to mitigate bankruptcy risk while reevaluating business strategies to align with long-term financial sustainability. Limitations and future directions were also discussed at the end of the study.

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Introduction

Bankruptcy risk consists of a firm's inability to meet the firm obligations and affects a wide range of stakeholders both internal and external, (Shi et al., 2022). This is the reason, for evaluation of the factors that are contributing to the bankruptcy risk is crucial for various business stakeholders (Zhang, 2023). Agustia et al. (2020) argued that earning management practices could vague the true financial health of a company, making it more challenging to assess bankruptcy risk accurately. Earnings management involves the manipulation of financial results to create a misleading view of a company's financial condition, benefiting individuals in contractual arrangements (Durana et al., 2021). While it is not wrong to prepare the financial statements as per International Accounting Standards (IAS) that will show the true financial position of the company (Agustia et al., 2020). This is based on the agency theory which suggests that business owners seek to maximize profits, while managers tend to be self-interested, especially when revenues affect firm performance (Jensen & Meckling, 1976). The above conflicts between the business owners and managers which are driven by self-interest could intensify bankruptcy risk as managers may prioritize personal gains over financial decision-making, potentially exposing the firm's long-term stability (Jensen & Meckling, 1976).

Outecheva (2007) proposes two concepts to define bankruptcy risk when thinking about financial risk. The first is event-oriented meaning that focuses on random events that signal an untrue event, such as a company going bankrupt or filing for bankruptcy. The second is a business decline that sees a decrease in cash flow, which can lead to distressed debts, dividend cuts, and bankruptcy. Altman (1968) defines bankruptcy as a situation where a company becomes legally insolvent and is placed under insolvency or allowed to reorganize under the law. Therefore, bankruptcy risk includes many financial distress situations rather than a direct result (Altman, 1968; Altman et al., 2017). Financial reporting that follows international standards is often associated with business management, which involves recognizing losses earlier than gains. However, Darrat et al. (2016) argue that financial monitoring increases the risk of bankruptcy. Darrat et al. (2016) further suggested that monitoring can reduce business risk by reducing management fees and ineffective renegotiations. They also argued that raising more money will reduce the cost of debt and reduce the risk of the business. Extant research indicated that bankruptcy risk remains a significant area of focus in the existing literature.

Business owners often face various challenges in interpreting financial statements especially when dealing with financial comparison or measurement (Senteney et al., 2020). In this case, investors need more relevant information provided by companies to make their investments Yarana (2023) because this information could minimize their risk. Accounting conservatism in financial statements plays a crucial role in assessing the bankruptcy risk of companies considering investment (Biddle et al., 2022). By prioritizing the early recognition of potential losses, conservatism enhances the ability to predict adverse events such as financial stress or bankruptcy, accurately assessing a company's stability and viability (Francis et al., 2013). The agency theory explains this relationship where the managers are employed by the principals to act in their best interests, particularly in decision-making (Francis et al., 2013). Accounting conservatism can mitigate information asymmetries between managers and shareholders by ensuring the early recognition of potential losses and providing transparent, reliable financial information (Ghazalat & AlHallaq, 2024). Additionally, accounting conservatism plays a critical role in enhancing financial predictability, reducing business risk, and helping managers and business owners take proactive measures to address organizational challenges (Biddle et al., 2023). These studies show that accounting conservatism is an important indicator of bankruptcy risk. Additionally, Dalwai and Salehi (2021) discusses how companies using business strategies such as leadership or diversification can reduce business risk. However, Agustia et al. (2020) pointed out that most of the companies have strategies but most of them are never implemented, which can affect the quality of performance and the achievement of goals. A business strategy is a comprehensive plan that combines the company's goals and the resources needed to achieve those goals (Ghazalat & AlHallaq, 2024). Companies could cope with uncertainties and unexpected problems in the future by using good business strategies. If companies have a clear strategy, they can detect threats early and adapt to changes such as reducing expenses or delaying capital investment to reduce risk (Ghazalat & AlHallaq, 2024). Such strategies help businesses cope with uncertainty and financial instability, increase their survival, and reduce the likelihood of bankruptcy (Zhang, 2023). These previous studies emphasized that business strategy is an important indicator of minimizing the bankruptcy risk of the companies.

In addition to the accounting perspective and business strategy especially in the accounting field, cash flow volatility and interest rates coverage also play an important role in assessing bankruptcy risk (Chiang & Tsai, 2020; Skogsvik et al., 2023). Cash flow volatility indicates the variability of a company's income, which is important for understanding its ability to meet its financial obligations (Ahmed & Sulong, 2023). Businesses with negative earnings will have difficulty paying off their debts, which increases business risk (Hong & Hung, 2022). The interest rate ratio is another important factor that measures a company's ability to pay interest from its operating income. A lower interest rate indicates that a company has a higher risk of defaulting on its debt because it does not have enough money to pay interest (Chiang & Tsai, 2020). The interest rate measures are important for underwriters of the company's creditworthiness assessment because they give an idea about the company's financial stability and its ability to prevent financial distress (Aldo, 2022). Therefore, authors have given importance to these indicators to determine the risks of lending or investing (Basten & Mariathasan, 2023). These previous studies shown that cash flow volatility and interest rate ration are important factors for the bankruptcy risk.

Extant studies have various notable gaps in the existing literature on accounting conservatism, business strategy, cash flow volatility, and interest coverage ratio on bankruptcy risk relationship. For instance, previous studies have primarily focused on the relationship between accounting conservatism, business strategy and bankruptcy risk (Agustia et al., 2020; Biddle et al., 2023; Dalwai & Salehi, 2021; Ghazalat, 2024; Ghazalat & AlHallaq, 2024; Luu Thu, 2023), less attention has been given to the roles of cash flow volatility and interest coverage ratio in this context. Cash flow volatility which indicated financial instability has inconsistently addressed the bankruptcy risk in the models (Rosita & Srimindarti, 2023). Also, interest coverage ratio shows the firm's ability to meet their

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interest expenses from their incomes has been also unexplored with the underwriting risk (Chiang & Tsai, 2020). The combined consideration of these four factors accounting conservatism, business strategy, cash flow volatility, and interest coverage ratio provides a stronger approach to understanding bankruptcy risk through filling a significant gap in existing research and offering a stronger framework for financial distress. Furthermore, extant studies also have more focused on other countries while have limited attention on Saudi Arabia country (Agustia et al., 2020; Biddle et al., 2023; Chiang & Tsai, 2020; Dalwai & Salehi, 2021; Ghazalat, 2024; Ghazalat & AlHallaq, 2024; Luu Thu, 2023). Therefore, to address the gaps, the research objective was to test the impact of accounting conservatism, interest coverage ratio, cash flow volatility, and business strategy on the bankruptcy risk of the non-financial sector in Saudi Arabia.

The study results contributed results from both theoretical and practical perspectives by integrating accounting conservatism, business strategy, cash flow volatility, and interest coverage ratio as key determinants of bankruptcy risk in the context of Saudi Arabia's non-financial sector which has limited attention in the extant literature. Previous studies were mainly focused on two aspects of accounting conservatism and business on bankruptcy risk with limited attention on cash flow volatility and interest rate ratio. Therefore, this study contributed to the impact of cash flow volatility and interest rate ratio along with two accounting conservatism and business strategy in the context of Saudi Arabia's non-financial sector. The study with this extended framework provides a more strong view of financial stability, offering valuable insights for managers, investors, and financial analysts in evaluating risk. The contributions of this study also enhance decision-making processes, enabling stakeholders to make more informed choices about risk management and strategic planning, ultimately fostering greater financial resilience in a rapidly changing economic environment. The study is further divided into four chapter's literature review, research methodology, data analysis and results, discussion, and implications of the study.

Literature Review

Theoretical Review

The bankruptcy risk is a major concern for researchers and stakeholders because it can lead to business losses (Darrat et al., 2016). Analyzing and predicting the risk of bankruptcy risk is important for informed investment decisions and accurate financial reporting, especially for operational failures that could occur when a company cannot meet its financial obligations (Darrat et al., 2016). Financial statements mostly reflect the risk of bankruptcy risk, and various financial ratios are widely used as important tools for predicting financial risk. Therefore, many studies have developed specific models for predicting bankruptcy (Adler, 1991; Altman, 2018). For example, Adler (1991) presented the risk of bankruptcy risk by highlighting two main factors that cause financial stress: internal and external causes. Internal factors generally arise from poor management, revenue management, inadequate business strategies, and poor corporate performance (Naresh Kumar & Sree Hari Rao, 2015). In this context, Kaggwa et al. (2024) argued that companies with

effective strategies can withstand internal and external challenges. These strategies include a careful mix of resources and activities that enable businesses to achieve sustainable development and use effective solutions to risks (Sadraei et al., 2023). Therefore, companies should evaluate their internal finances and performance relative to the external market, including their competitiveness, to reduce business risk.

Business strategy is an operational framework designed to achieve business goals. Effective management involves setting long-term goals, creating appropriate activities, and allocating resources to achieve those goals (Olaniyi et al., 2023). Through using the right business strategy, companies can increase their profits and revenues and protect their assets (Olaniyi et al., 2023). This helps companies preserve cash and other resources and reduce business risks (Ghazalat & AlHallaq, 2024). Cash flow is a direct indicator of a company's resources and efficiency, allowing businesses to meet short-term obligations and invest in growth opportunities. Insufficient funds can affect performance and business risk (Wang et al., 2023). At the same time, financial leverage also indicates the company's dependence on financial debt, which affects its financial stability. High leverage can limit a company's ability to repay its debt, especially in times of recession or declining earnings, and thus lead to financial stress (Olaniyan et al., 2020). On the contrary, managing the balance sheet allows companies to optimize their resources and improve their ability to maintain working capital (Brusov et al., 2021). Therefore, maintaining a good income and managing resources are important to reduce the risk of losing money and ensuring financial stability (Brusov et al., 2021).

As discussed by Fuad et al. (2023) accounting conservatism is characterized by conservative practices that reduce reported income by delaying revenue recognition and the experience of rapid budgeting. Similarly, Bolgorian and Mayeli (2020) define maintenance as a process that requires attention and high verification standards, requiring investment losses to be recorded immediately and recognized only when completed. This principle ensures that revenues are recognized later and expenses are recognized first. Teymouri and Sadeghi (2020) established a link between accounting conservatism and bankruptcy risk by stating that accounting prudence promotes investment efficiency by estimating income and assets and reducing the dividend yield given to the president. In the same vein, cash flow volatility also increases the bankruptcy by increasing the uncertainty in meeting financial obligations which leads to higher borrowing costs, reduced liquidity, and diminished stakeholder confidence. This instability makes companies more vulnerable to financial crises and external shocks (Hejranijamil et al., 2020). On the other hand, interest rate coverage also increases the bankruptcy risk which indicates a company's ability to generate sufficient earnings to cover its interest expenses. This financial strain can lead to defaulting on debt obligations, eroding investor confidence, and triggering insolvency (Wang et al., 2020). The origin of savings can be traced back to balance sheet measurement principles (Sari, 2020). These previous studies have shown accounting conservatism, cash flow volatility, interest rate coverage, and business strategies are important factors of bankruptcy risk which comes under agency theory. These above variables are predicted in Figure 1 below,
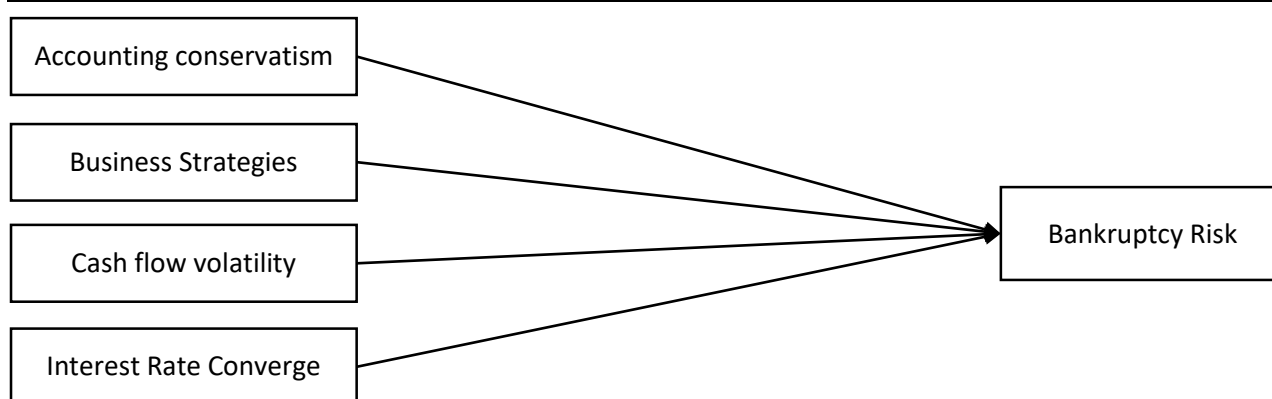
Figure 1: Conceptual Framework

Accounting conservatism and bankruptcy risk

Fuad et al. (2023) stated that in accounting conservatism International Financial Reporting Standards (IFRS) is aimed to prepare financial statements in one standard. The main objective of IFRS is to increase the quality and transparency of financial reporting worldwide. Accounting conservatism is a fundamental principle of accounting and plays an important role in developing sound financial reporting (Teymouri & Sadeghi, 2020). This principle focuses on revenue recognition through careful monitoring, which shows that both positive and negative factors in the financial performance of the company are carefully reacted to (Hejranijamil et al., 2020). IFRS uses strict accounting standards to recognize positive revenue and emphasize the timely reporting of negative revenue (Fuad et al., 2023). Therefore, IFRS is closely related to financial efficiency and savings (Biddle et al., 2022). The fundamental feature of accounting conservatism is recognizing all known and unrealized costs while recording revenue only when incurred (Biddle et al., 2022). This practice often leads to reduced revenue and increased data loss, which can cause serious losses to the company (Biddle et al., 2022). Such benefits can bring companies closer to the risk of bankruptcy by establishing a direct link between savings and the risk of bankruptcy (Ghazalat & AlHallaq, 2024). Conservatism is often seen as a response to risks that arise in the company's environment (Ghazalat & AlHallaq, 2024). Teymouri and Sadeghi (2020) further identified that accounting conservatism is related to the long-term stability and performance of a company, while unconditional conservatism can hurt the financial health of a company in the short term. Similarly, Biddle et al. (2023) show that accounting conservatism has a positive impact on the performance and long-term results of a company. These practices enable the company to achieve its business goals and reduce the risk of bankruptcy. Based on the above studies, a study has formulated the following research hypothesis,

H1: Accounting conservatism has a significant impact on bankruptcy risk.

Business Strategy and Bankruptcy Risk

Organizations operate in a constantly changing environment and need to respond to challenges such as introducing new products or services to gain competitive advantage (Agustia et al., 2020). Business strategy refers to the production of goods or services at the lowest cost without compromising quality (Zhang, 2023). This approach often involves practices such as "just-in-time" (JIT) inventory management to reduce economies of scale and storage costs (Dvorský et al., 2020). In contrast, a different strategy focuses on offering unique products,

quality products, or services that stand out in the market. Porter et al. (1974) further suggested that organizations can respond to competitive challenges and achieve long-term goals by using strategies that differ from their competitors. These strategies not only help manage the economy but also reduce the risk of financial distress. The relationship between business quality and accounting has been extensively investigated in the literature (Abugalia & Mehafdi, 2018). They also emphasized that accounting plays an important role in supporting good decision-making, providing insight into potential courses of action, and facilitating the implementation of ownership.

Financial analysis promotes success through various applications such as planning resources to predict future results and determining product or service costs to achieve financial goals (Castanias, 1983). This process ensures that organizational strategies are effectively implemented and linked to operational goals that could decrease bankruptcy risk. Habib (2023) added that business management continues to bridge the gap between past performance and future planning, turning it into future information which helps minimize bankruptcy risk. According to Ghazalat and AlHallaq (2024), cost leadership and differentiation are the basic strategies in business competition and accounting plays an important role in their development. Agustin and Bertuah (2024) further added that business practices provide managers with the information needed to analyze cost models, make effective decisions, and improve applicable cost processes according to good standards which reduces business risk. Zhang (2023) also argued that advanced planning processes have a positive impact on the development and execution of business strategies. Achieving success from a strategic start depends on the integration of business practices that could minimize the bankruptcy risk of the companies. Based on previous literature, the following hypothesis is formulated below,

H2: Business Strategy has a significant impact on bankruptcy risk

Cash Flow Volatility and Bankruptcy Risk

Cash flow volatility refers to the degree to which a company's cash inflows and outflows change over time. It reflects uncertainty about the company's ability to generate regular financial resources to meet its financial obligations (Ahmed & Sulong, 2023). The majority of financial complaints usually point to unstable operations or poor financial management, which can lead to financial disruption and poor financial performance (Van Do & Duong Phan, 2022). Managing variable income is important for businesses because it ensures sufficient capital to meet daily expenses, repay debts, and encourage good investment. If there is a lack in security of cash then it

could lead to financial stress which could increase the bankruptcy risk (Naser et al., 2024). If the companies have more cash flow then they can manage their funds to get their payments to the debt holders which could minimize bankruptcy risk (Naser et al., 2024). While, if companies have negative cash flow then they are unable to get their payments to their debtholders which could lose of confidence and increase bankruptcy risk. Therefore, understanding the dynamics of cash flow volatility and their role in reducing the risk of bankruptcy is crucial for the long-term sustainability and recovery of businesses. Luukkonen (2024) further found that companies with high cash flow volatility face higher business risk due to their inability to meet financial obligations. Their research shows that financial instability can affect to company's ability to repay debt which increases bankruptcy risk. Skogsvik et al. (2023) also showed that cash flow volatility could affect financial health and could increase bankruptcy risks. Their research also shows that changes in cash flow can have a significant impact on business shocks, making companies more vulnerable to economic downturns when they run out of cash. Keefe and Nguyen (2023) also showed that companies with higher earnings are less likely to invest in growth opportunities because they are more important than investing in the long term. While such attention can reduce financial burdens immediately, it often increases competition and the business's bankruptcy risk. These previous studies have shown cash flow volatility is an important concern for bankruptcy risk. Therefore, a study has formulated the following research hypothesis below,

H3: Cash flow volatility significantly influences bankruptcy risk.

Interest Coverage Ratio and Bankruptcy Risk

The interest coverage ratio (ICR) shown the ability of the company to meet their interest liability from their earnings before interest and tax (EBIT) (Suranta et al., 2023). It is calculated by dividing EBIT by the interest rate and is an important measure of financial health and solvency (Iotti et al., 2024). A higher ICR means the company generates enough income to cover the interest, while a lower ratio indicates a financial crisis and higher risk (Feng et al., 2024). The importance of this example is that it can demonstrate the company's ability to handle its debts, which is important for maintaining creditor confidence and avoiding doing business concerning its financial obligations. Firms with low or negative ICRs may have difficulty managing their debts, especially during recessions or bankruptcies (Lawal & Yahaya, 2024). They also argued that if firms have inappropriate ICR then it could lead to the defaults of the companies that could enhance the bankruptcy risk. On the other hand, companies with good ICR can meet their debtholder's needs which could minimize the bankruptcy risk. Aderemi (2024) further identified ICR as one of the best predictors of corporate performance in the Z-score model. Their research shows that companies with an ICR below 1.5 are more likely to face bankruptcy because inadequate earnings hinder their ability to meet job satisfaction. Sitinjak and Yusni Warastuti (2024) also further show that a decline in ICR is a sign of financial distress particularly in the big leveraged firms. These findings emphasized the urgent need for firms to maintain a strong ICR to mitigate negative financial performance. Their activities negatively impact the business and the firm. They find that firms with an ICR below 1 are often forced to increase their assets or restructure their debt, increasing the risk of bankruptcy.

(Tsiouni et al., 2023) also found that a declining ICR is an early warning sign of bankruptcy, especially in an economy with a tight income structure. Based on previous literature, researchers have formulated the following research hypothesis below,

H4: Interest Coverage Ratio has an inverse significant impact on bankruptcy risk.

Research Design

The study objective was to investigate the influence of accounting conservatism, interest coverage ratio, cash flow volatility, and business strategy on the bankruptcy risk of the non-financial sector in Saudi Arabia. For this purpose, researchers employed the panel data quantitative approach which consisted of both cross-sectional and time series dimensions as compared to cross-sectional data (Hirose & Creswell, 2023). On the other hand, the research design was longitudinal where data was collected at different times and this also allows for the analysis of dynamic relationships and controls for individual heterogeneity over time (Panda & Mohapatra, 2024). Unlike cross-sectional data, panel data facilitates more strong changes in the variables. Therefore, the study used the longitudinal research design.

Sample Selection and Data Sources

Data were collected from the annual reports of the non-financial companies of Saudi Arabia for the period of 2016 to 2024. Data was collected from the annual reports in different criteria. The firms were excluded which have various capital structures and reporting systems as per the IFRS in addition, companies were also excluded which had missing data for 3 years. Furthermore, only firms that disclosed debt capital in their financial statements were included, as financial leverage was used to measure capital structure. The study also emphasized the strengths of standardized accounting practices, which provided consistency and comparability across firms, enabling a more strong analysis. Moreover, cash flow volatility was considered which is to reflect the firms' operational risk and financial health. The inclusion of the interest coverage ratio added further depth, offering insights into the firm's ability to meet debt obligations. These measures help to enhance the reliability of the analysis. Consequently, the final sample consists of balanced panel data from 100 Saudi non-financial listed companies. Since the sample includes data from 100 firms over 9 years (2016–2024) panel data methodology was identified which is considered to be a more suitable approach for the study.

Empirical Models and Method

Due to the dynamic characteristics of the main variable research, the dynamic panel model is used in this research. The study objective is of a dynamic nature which lies in analyzing how accounting conservatism, interest coverage ratio, cash flow volatility, and business strategy interact over time to influence the evolving bankruptcy risk in Saudi Arabia's non-financial sector. This approach is considered to be dynamic as it is considered to be the evolving nature of financial and strategic factors over time, acknowledging that past values of variables such as accounting conservatism, interest coverage ratio, and cash flow volatility influence present and future outcomes. Arellano and Bond (1991) developed a GMM estimator to solve economic problems. GMM allows for heteroscedasticity and solves the autocorrelation problem through covariance.

"GMM has the best five general least squares (OLS) and fixed effects. Firstly, in contrast to OLS, the GMM estimator allows the firm problem to capture the volatility of different firms or markets by estimating time-varying coefficients and groups (Bai, 2009). System GMM effectively handles unobservable variables in the data of various groups or organizations". When examining non-visual effects, considering both static and nonvisual effects can estimate potential interactions between variables (Arellano & Bond, 1991). It can provide more reliable estimates by combining data from different periods and overlapping units. This contributes to a broader analysis of how change evolves by capturing long-term changes and changes that static models may miss (Blundell & Bond, 1998). Help to consider different periods of the relationship between freedom and change. This is particularly useful in identifying situations where the effects of certain outcomes are consistent over time (Blundell & Bond, 1998). This approach is important for dynamics as it is important for evolving the nature of financial and strategic factors over time which acknowledges that past values of variables such as accounting conservatism, interest coverage ratio, and cash flow volatility influence present and future outcomes. Fourthly, system GMM also offered a flexibility in modeling of the complex processes through properly incorporating the various variables, different interaction terms (Arellano & Hahn, 2007). This also addresses the endogeneity by properly associating explanatory variables with the data but not with error terms which reduces bias and improves reliability. Additionally, it also can manage measurement errors and autocorrelation enhances the validity of

indicators (Arellano & Bond, 1991). Contrasting standard GMM, the system GMM used various lagged variables as instruments which provides consistent and unbiased estimates (Roodman, 2009). To ensure its appropriateness, tests such as the Sargan test (validating all instruments), Hansen J test (assessing robustness against heteroscedasticity), and AR(2) test (checking for second-order autocorrelation) are appropriate which confirmed the suitability of the method. The dynamic model used in this study is as follows:

$$BR_{it}=\lambda BR_{it-1}+\beta_1 AC_{it}+\beta_2 ICR_{it}+\beta_3 CFV_{it}+\beta_4 BS_{it}+\beta_5 FS_{it}+\beta_6 ROA_{it}+\beta_7 LEV_{it}+\beta_8 AQ_{it}+\mu_i+v_t+\epsilon_{it}$$

Where,

BR_{it}: Bankruptcy risk for firm iii at time ttt
BR_{it-1}: Lagged bankruptcy risk (dynamic component capturing past influence)
AC_{it}: Accounting conservatism
ICR_{it}: Interest coverage ratio
CFV_{it}: Cash flow volatility
BS_{it}: Business strategy
FS_{it}: Firm size (control variable)
ROA_{it}: Return on assets (control variable)
LEV_{it}: Leverage (control variable)
AQ_{it}: Audit quality (control variable)
μ_i: Unobservable firm-specific effects
v_t: Time-specific effects
ϵ_{it}: Error term

Measurement of the study variables presented in the Table 1 below.

Table 1: Variable Measured

Variable	Measurement	
Dependent Variable		
Bankruptcy Risk	Bankruptcy risk is measured from the Altman Z-score, where a value less than 1.2 indicates more bankruptcies and greater than 2.29 shows a suitable situation in bankruptcy.	(Altman, 2018)
Independent Variables		
Accounting Conservatism	Measured by accrual base method	(Ghazalat & AlHallaq, 2024)
Cash flow volatility	Cash flow standard deviation/average of cash flow	(Huang, 2009)
Interest coverage ratio	EBIT/interest expense	(Iotti et al., 2024)
Business strategy	IF the firms has cost leadership strategy then is measured by 1 otherwise zero. Used cluster analysis for ratio	(Ghazalat & AlHallaq, 2024)
Control Variables		
Firm size	The total assets' natural logarithm	(Ghazalat & AlHallaq, 2024)
ROA	EBIT to total assets	(Wang et al., 2020)
Financial Leverage	Total debt to total equity	(Ghazalat & AlHallaq, 2024)
Audit Quality	1 for audited reports and if not audited then 0	(Abu Afifa et al., 2023)

Descriptive Statistics

Table 2 predicted results show the descriptive statistics of the non-financial sector of Saudi Arabia. Among the variables, the bankruptcy risk is 2.501 with a standard deviation of 0.804 which indicates a moderate variation in the financial health of firms. Accounting conservatism has a mean of 0.61 (SD = 0.199), suggesting a relatively balanced approach to conservative accounting practices across firms. Cash flow volatility, with a mean of 0.15 and SD of 0.21, demonstrates some level of fluctuation in firms' cash flows, while the interest coverage ratio (mean = 3.51, SD = 1.201) suggests firms have a reasonable ability to cover interest expenses. The business strategy variable (mean = 0.551) indicates a slight majority of firms adopting a cost-leadership strategy. Firm size, with a mean of 9.502 (SD = 2.12) which reflects a mix of smaller and larger firms, while the return on assets (mean = 0.053, SD = 0.061) shows relatively modest profitability. Financial leverage, with a mean of 1.812 (SD = 0.897), suggests firms are moderately

leveraged. Lastly, audit quality, with a mean of 0.751, reveals that a significant portion of firms are audited by one of the Big 4 firms, ensuring a level of credibility in financial reporting. The above result is predicted in Table 2 below,

Table 2: Descriptive Statistics

Variable	Mean	Standard Deviation (SD)	Minimum	Maximum
BR	2.501	0.804	1.212	4.512
AC	0.61	0.199	0.221	1
CFV	0.15	0.21	0.022	0.351
ICR	3.51	1.201	1	7.531
BS	0.551	0.498	0	1
FS	9.502	2.12	5.120	15
ROA	0.053	0.061	-0.121	0.251
LEV	1.812	0.897	0.531	3.521
AQ	0.751	0.433	0	1

Correlation Results

Table 3 results show the correlation results in the non-

financial sector of Saudi Arabia. The results show that there is a strong positive correlation between accounting conservatism (AC) with the bankruptcy risk (BR) (0.625) which suggests that more conservative accounting practices are associated with higher bankruptcy risk. Cash Flow Volatility (CFV) also has a significant positive relationship with BR (0.512) which also indicates that firms with more volatile cash flows tend to have higher bankruptcy risk. Interestingly, the Interest Coverage Ratio (ICR) does not show an insignificant correlation with BR, suggesting that firms' ability to cover interest expenses may not be directly tied to bankruptcy risk in this context. Business Strategy (BS) shows a negative significant relationship with BR (-0.306), suggesting that firms with a cost leadership strategy are associated with lower bankruptcy risk. Firm Size (FS) is positively correlated with

BR (0.423), indicating that larger firms in Saudi Arabia may face higher bankruptcy risk, which could be due to the complexity and financial demands associated with larger operations. Return on Assets (ROA) and Financial Leverage (LEV) are positively correlated with BR, with ROA (0.356) indicating that firms with lower profitability are at higher bankruptcy risk, and LEV (0.604) suggesting that firms with higher leverage tend to have a greater risk of bankruptcy. Finally, Audit Quality (AQ) shows the strongest positive correlation with BR (0.782), highlighting that firms with lower audit quality tend to have a higher bankruptcy risk, potentially due to less transparent financial reporting. The Variance Inflation Factor (VIF) values suggest that multicollinearity is not a significant concern in this model, as all VIFs are below the threshold of 5.

Table 3: Correlation Matrix

Variable	BR	AC	CFV	ICR	BS	FS	ROA	LEV	AQ	VIF
BR	1									
AC	0.625***	1								2.1
CFV	0.512***	0.473***	1							1.21
ICR	0.085	0.102*	0.022	1						1.671
BS	-0.306***	-0.152*	-0.318***	-0.128*	1					1.821
FS	0.423***	0.532***	0.421***	-0.167*	-0.276***	1				1.783
ROA	0.356***	0.210**	0.314***	0.053ns	0.104ns	0.523***	1			1.832
LEV	0.604***	0.484***	0.369***	0.215**	-0.156*	0.467***	0.539***	1		1.562
AQ	0.782***	0.641***	0.575***	-0.004ns	-0.262***	0.711***	0.432***	0.745*	1	1.941

Hypothesis Testing and Diagnostics Test

There were some diagnostics tests were conducted to move towards the GMM model which are predicted in Table 4. For this purpose, the Sargan test was employed to test the construct validity The Sargan test p-value exceeds the 0.05 significance level, so the null hypothesis cannot be rejected. This indicates that the instruments are valid and free from endogeneity issues, ensuring that the regression estimates are both unbiased and consistent (Arellano & Bond, 1991). In the same vein, the Hansen J test examines the validity of the overidentifying restrictions of the

instruments. A p-value greater than 0.05 (in this case, 0.174) confirmed the validity of the instruments and suggests they do not suffer from heteroscedasticity (Roodman, 2009). This result is further supported by the robustness of the system-GMM approach. On the other hand, the AR (2) test was used to detect second-order autocorrelation in the residuals. A p-value above 0.05 indicates no significant second-order autocorrelation, confirming that the error terms are independent and meeting the assumption of no serial correlation (Blundell & Bond, 1998).

Tabel 4: Diagnostics Results

Diagnostic Test	Null Hypothesis	Test Statistic	p-value	Result
Sargan Test	Instruments are valid and uncorrelated with the error term	21.35	0.112	Fail to reject null (instruments valid)
Hansen J Test	Instruments are valid and not correlated with the errors	15.56	0.174	Fail to reject null (instruments valid)
AR(2) Test	No second-order autocorrelation in the residuals	1.21	0.226	Fail to reject null (no autocorrelation)

Empirical Findings

When the diagnostics tests are satisfied then the next step is to test the study hypothesis. The panel data results from the regression results show that accounting conservatism has a negative and significant (ß=0.120, p-value = 0.021) impact on the bankruptcy risk of the non-financial sector of Saudi Arabia. This result shows that firms that adopt conservative accounting practices are less likely to experience bankruptcy risk, as these practices help present a more stable financial position by underreporting assets or over-reporting liabilities. In contrast, business strategy exhibits a significant positive (ß=0.185, p-value = 0.003) impact on bankruptcy risk. This indicates that firms

with well-defined and strategically aligned business plans are more resilient to bankruptcy risk. The results for cash flow volatility (beta = -0.198, p-value = 0.003) have a negative and significant impact on underwriting risk. The interest coverage ratio has an insignificant impact (beta = -0.085, p-value = 0.182) on bankruptcy risk which indicates that these financial factors do not have a meaningful impact on bankruptcy risk in the sample analyzed. These findings suggest that, in the Saudi non-financial sector, other factors such as accounting practices, cash flow volatility, and business strategies may be more influential than interest coverage in predicting bankruptcy risk. The above results are predicted in the following Table 5 below,

Table 5: Hypothesis Results

	Bankruptcy Risk			
Hypothesis	Coefficient	Std. Error	t-statistic	p-value
AC	-0.12	0.052	-2.31	0.021
BS	0.185	0.061	3.03	0.003
CFV	-0.198	0.073	-2.71	0.003
ICR	-0.085	0.064	-1.33	0.182

Source: Author's Illustration

Discussion

In the current dire scenario, the management of bankruptcy is considered to be important for ensuring financial stability and long-term viability which enables firms to identify potential risks early and implement strategies to mitigate financial distress. Effective management safeguards stakeholders' interests and supports sustainable growth, particularly in volatile economic environments. Therefore, the research objective was to test the impact of accounting conservatism, interest coverage ratio, cash flow volatility, and business strategy on the bankruptcy risk of the non-financial sector in Saudi Arabia. The research results show that accounting conservatism has a negative and significant impact on the bankruptcy risk of non-financial companies in Saudi Arabia. These results show that in Saudi Arabia companies have greater attention on conservative accounting rules which are successfully recognizing losses quickly and gains slowly forcing firms to present a more conservative picture of their financial health. Because Saudi Arabia is a country that has been greatly impacted by fluctuations in oil prices, regulatory changes, and global economic shifts, accounting conservatism serves as an important tool for improving companies' long-term resilience to falling into distress. The results are consistent with the studies of Ghazalat and AlHallaq (2024) where they indicated the impact of accounting conservatism on improving a firm's safety margins to bankruptcy by providing less over-optimistic information in financial reporting and enabling stakeholders to have better assessments of firms' actual performance. These findings suggested that accounting conservatism is an important component for companies, especially in the non-financial sector within Saudi Arabia where it a need to follow the ongoing structural changes in the economy that could increase their competitive advantage.

Further results show that business strategy has a positive and significant impact on the bankruptcy risk of non-financial companies in Saudi Arabia. The positive effect results show that there is proper importance of strategic planning in the Saudi Arabian non-financial sector for guarding against bankruptcy. Companies with very clear and well-defined business strategies are better able to survive many of the challenges that come with a very dynamic and changing market. The results are consistent with the findings of Zhang (2023) who argued that adaptation capabilities to competitive surroundings through good business strategies can greatly cut vulnerability to financial distress. Their findings indicated that non-financial companies in Saudi Arabia have a greater chance of survival if they align their company strategies with national objectives, particularly with the long-term objectives of the nation to reduce the potential market turbulence. This argument enforced that companies that are engaged in good strategies for risk management are less likely to find themselves facing liquidation compared to companies without clear strategic direction, particularly during this transformation period that could increase the firm's financial health.

Furthermore, cash flow volatility also has a negative and significant impact on the bankruptcy risk of nonfinancial companies in Saudi Arabia. These results show that firms in Saudi Arabia's cash flows are dynamic because these firms can take the pressure that comes with economic hardship and still be better off than before. Within the context of the Saudi non-financial industry, this finding relates to other studies based in other economies recording, for instance, the improved capability of adaptable business structures or vibrant managerial systems to survive and recover from turmoil across apparently more volatile environments. For instance, companies with volatile cash flows could adjust their operations or seek external financing to mitigate risks, reducing the likelihood of bankruptcy. The results are consistent with the study of (Ahmed & Sulong, 2023; Van Do & Duong Phan, 2022), where they suggested that firms that could manage cash flow volatility effectively, through strategic diversification or adaptive financial practices, tend to have a lower risk of financial distress. These findings are important for Saudi Arabia's non-financial companies where economic fluctuations are driven by global oil prices and the push for diversification with robust cash management strategies is likely to be more resilient, allowing them to leverage volatility as a tool for growth rather than a precursor to bankruptcy. Therefore, the negative and significant impact of cash flow volatility on bankruptcy risk in this study may reflect the ability of Saudi firms to increase firms profitability.

Lastly, an insignificant association between interest coverage ratio and bankruptcy risk has been found. These findings show that the interest coverage ratio is not a significant predictor of bankruptcy risk in non-financial companies in Saudi Arabia. The results are in line with the study of (Feng et al., 2024; Lawal & Yahaya, 2024) where they emphasized the importance of liquidity and solvency measures in predicting bankruptcy risk. A possible reason for the insignificant impact in the non-financial sector is that non-financial firms in the country operate with less reliance on debt especially, in the wake of initiatives to reduce financial sector risk and encourage private sector investment. The low significance of the interest coverage ratio may also suggest that firms could manage financial risks through alternative means, such as government support or strategic partnerships, rather than relying solely on debt management measures. This highlighted the distinguishing financial environment of the Saudi Arabia's non-financial sector, where factors like government policy and economic diversification efforts may reduce the traditional significance of financial ratios like the interest coverage ratio in bankruptcy prediction that could increase firms competitive advantage. The above findings enforced that cash flow volatility and interest coverage ratio are important indicators of managing bankruptcy risk.

Theoretical and Managerial Implications

The study has theoretical and managerial implications based on the study findings. Theoretically, the study contributed both cash flow volatility and interest coverage ratio along with the accounting conservatism and business strategy which has limited attention in extant literature in the context of Saudi Arabia's non-financial companies. Therefore, by incorporating cash flow volatility and interest coverage ratio, this research provides a more strong view of financial stability, offering valuable insights for managers, investors, and financial analysts in evaluating risk. In addition, the negative and significant impact of cash flow volatility and accounting conservatism contributed to enhancing cash flow velocity, and adopting accounting conservatism may reduce bankruptcy risk by improving financial transparency and liquidity management. This suggests that more efficient cash flow management and conservative reporting practices can serve as proactive measures for financial stability. Further, the insignificant impact of the interest coverage ratio

challenges traditional assumptions that these financial metrics are always key indicators of financial distress. This suggests that the dynamics of bankruptcy risk are more complex, especially in emerging economies like Saudi Arabia, where firms may have access to unique strategic resources and support mechanisms that alter the usual predictive relationships. Therefore, this study's findings contributed to helping other researchers conduct their research by investigating additional moderating factors, such as firm size, government support, or macroeconomic conditions, to further refine the understanding of bankruptcy risk in such economies in the context of Saudi Arabia.

From a managerial perspective, the findings have important implications for firms in Saudi Arabia's non-financial sector, particularly in light of the country's ongoing economic diversification efforts under Vision 2030. First, the significant negative relationship between accounting conservatism and bankruptcy risk suggests that managers should adopt conservative accounting practices to enhance financial transparency and reduce the likelihood of financial distress. This is crucial as firms navigate an uncertain economic environment. Furthermore, the significant positive relationship between business strategy and bankruptcy risk underlines the importance of developing and executing clear business strategies that align with market trends and national development goals. Although cash flow volatility and interest coverage ratio were found to be statistically insignificant, managers should not completely disregard these factors but rather focus on integrating them into a broader risk management framework. Particularly, firms should consider managing liquidity and cash flows through strategic measures that account for volatility in the context of Saudi Arabia's economic reforms and diversifying market dynamics. This study emphasizes the need for strong financial strategies that incorporate both traditional and emerging financial indicators to ensure long-term sustainability and stability in the face of shifting market conditions.

Limitations and Future Directions

The study has various limitations and future directions that could be addressed in future studies to increase the strength of the study. One limitation of the study is that the study focused on the direct effect which restricts the understanding of potential mediating or moderating factors that could provide deeper insights into the relationships examined. Future research could address this by exploring variables such as financial resilience or market conditions to uncover underlying mechanisms. Another limitation of the study is that the study focused on Saudi Arabia's non-financial sector which limited the generalizability of the findings to other regions with different economic, financial, or cultural contexts. To overcome this, future studies could expand the scope to include multiple countries, enabling comparative analyses across diverse settings. Finally, the study focused on panel data, while useful for observing trends over time, may fail to capture short-term variations or external shocks. Future research could employ mixed data methods, such as time series or cross-sectional analyses, to provide a more dynamic and comprehensive perspective.

Conclusion

The management of bankruptcy is considered to be important for ensuring financial stability and long-term viability which enables firms to identify potential risks early and implement strategies to mitigate financial distress. Therefore, the study objective was to test the impact of accounting conservatism, interest coverage ratio, cash flow volatility, and business strategy on the bankruptcy risk of the non-financial sector in Saudi Arabia. The dynamic panel data results show that accounting conservatism and cash flow volatility have negative and significant impacts on bankruptcy risk. While the business strategy has a positive and significant impact on bankruptcy risk. On the other hand, the interest coverage ratio has an insignificant impact on the bankruptcy risk of non-financial companies in Saudi Arabia. The findings with these results contributed to the extant literature by highlighting the dual role of accounting conservatism and cash flow volatility in reducing bankruptcy risk, while emphasizing the counterproductive influence of certain aggressive business strategies on financial stability. The study for the practitioners emphasized the importance of adopting conservative accounting practices and managing cash flow effectively to mitigate bankruptcy risk while reevaluating business strategies to align with long-term financial sustainability. Further study room for other researchers has been also discussed.

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