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Weighting Risk Factors for Start-up Businesses in Small and Medium Enterprises: A qualitative approach and ATLAS ti procedure

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Abstract
Risk management is essential in helping Small and Medium Enterprises to grow and survive with all the risks and challenges they face. Risk assessment is one of the processes in risk management, which includes risk identification and evaluation. Risk management tools and techniques differ based on the type of business. Thus, this paper aims to evaluate risk factors in risk management for start-up businesses in Small and Medium Enterprises. The data was collected by interviewing the experts in Small and Medium Enterprises and analysed using ATLAS ti. It has been found that entrepreneurial traits are the most significant risk factor.

Keywords: Risk Factors; SMEs; Qualitative Method; ATLAS ti.

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1.0 Introduction

The significant role of Small and Medium Enterprises (SMEs) as a contributor to economic growth and decreasing the issues of unemployment in Malaysia has motivated Malaysians, especially the young generation, to be involved in this field. Besides, the government encourages people to get involved in entrepreneurship by providing financial aid and introducing entrepreneurship programs. Hence, many people seize the opportunity to start a business. However, despite the success of many people in this field, the statistics of people who fail in the first five years of the business are also prominent. According to Kee et al. (2019), entrepreneurs struggle to sustain and survive in this field because of the risks and challenges entrepreneurs face, resulting in failure rates ranging from 50% to 95%.

Thus, enterprise risk management (ERM) plays an essential role in helping entrepreneurs identify and manage business risks. Effective ERM practices can help a firm (SME) achieve sustainability and high performance, according to Hamir & Md. Sum (2021), three steps are commonly used in many risk management processes with different tools and techniques. The three common and essential steps are risk identification, analysis, and evaluation (Hamir & Md. Sum, 2021). These steps provide the input such as factors, consequences, indicators, level of risk and others. It is critical for the following stage, in which risk management choices are made (Bensaada & Taghezout, 2019). Risk identification and assessment are critical steps in the risk management process. Previous researchers used a variety of approaches and procedures to identify and assess risks in SMEs, including SWOT analysis, risk matrix, literature review, and interviews. Besides, indicators and indices in risk assessment have been used in numerous industries.

SMEs typically have more straightforward internal organisations than larger enterprises. This makes them more flexible and efficient at responding to and adjusting to change. Furthermore, SMEs are more prone to be affected by numerous risks than larger businesses due to limited resources and structural factors. Many previous researchers discussed risk in SMEs, but there is no study on start-up businesses in SMEs. Thus, this study aims to identify the main risk factors of start-up businesses in SMEs and to determine the

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weightage of each risk factor. In the future, this weighting will be used in developing a mathematical formulation of the risk index of start-up businesses in SMEs to be used as an alternative tool for assessing risk management for SMEs. A qualitative approach was used to collect the data by interviewing the experts in SMEs, and then the data was analysed using the software ATLAS ti.

2.0 Literature Review

Start-up businesses faced many risks, resulting in many struggling for the first five years and some failing. Business ventures are exposed to various types of risk (Vesković, 2014). According to a study by Saputra et al. (2021), start-up faces 24 risks that can disrupt business operations. Many SMEs face challenges, issues, and difficulties securing their long-term capability and remaining competitive in a constantly changing market. According to Hayes (2022), ERM frequently categorises the risks entrepreneurs face into three categories: operational, financial, and strategic. The operational risks impact day-to-day operations, while the strategic risks affect long-term plans. Besides, companies are impacted by financial risks regarding their general financial standing and health.

According to Belás et al. (2018), a business faces financial risk when its cash flows are insufficient to pay creditors and fulfil other obligations. In the past, studies have shown that various factors influence the intensity of financial risk in SMEs. To ensure the effective management of financial risk in a given country, it is crucial that factors determining the intensity of the risk are assessed and regularly innovated in accordance with the specific characteristics of its entrepreneurial environment (Belás et al., 2018). Boom (2019) believed managing financial risks is more important to avoid the ensuing financial distress that increases default probabilities.

Some researchers have also examined business risks other than financial risks in SMEs, such as safety and legal risks (Virglerova et al., 2020). According to Virglerova et al. (2020), there are other types of risks that can result in financial losses that need to be managed besides financial ones. In a global economic environment, companies need to manage strategic risks effectively to improve their competitiveness (Belás et al., 2021). Risks related to bamboo handicrafts include market risk, operational risk, and financial risk. In comparison to financial risk, market risk and operational risk fall into the red zone, which indicates they are the most significant risks (Hirawati & Sijabat, 2020). Political stability and economic growth are complementary and should receive special consideration in policymaking. Instability in politics can result in disproportionate allocations of resources on a physical, human, and social level (Zonouzi et al., 2021).

A critical character trait of entrepreneurs, according to Shahzad, M.F. et al. (2021), is their willingness to take risks. By taking risks, entrepreneurs can support free markets and promote competition (Shahzad et al., 2021). Individual entrepreneurs' personality traits and motivations determine the business environment. Business circumstances are distinctive in their unpredictability, complexity, and changing requirements throughout the business process. Entrepreneurs must be able to integrate numerous personalities simultaneously and as one person. This is to display the ability to operate as investors, inventors, accountants, dispute investigators, leaders, technologists, marketing specialists, and top sellers. As a result, the greater an entrepreneur's knowledge and talents, the better (Frese & Gielnik, 2014). Kvietok (2013) says the decision to accept a business risk indicates a specific person. According to Hvide and Panos (2014), risk-tolerant individuals are more likely to establish their businesses. Motivation to take on business risks is crucial to success.

Bensaada and Taghezout (2019) propose that risk analysis and measurement can be done using qualitative and quantitative methodologies. Specific risk management procedures, such as the enterprise risk management system, combine risk identification and evaluation into a single component (Bensaada & Taghezout, 2019). Indicators and indices are useful to measure risk and/or exposure at the national level and for international and global comparisons (Dilley et al., 2005). As an analytical tool for assessing disaster preparedness, the risk management index is used to evaluate the operational readiness of critical services. Based on the study Abdul Hadi et al. (2022), there is a lot of hope in the notion of company improvement. The index was built utilising multi-criteria decision-making techniques. A development's synthesis impact assessment, which incorporates all these characteristics, may be helpful in analysing a company's long-term viability and making judgments about construction management diversification and economic capital allocation. Previous index implementations provided equal weight for different factors, resulting in less accurate results (Cabello et al., 2021).

3.0 Methodology

By using qualitative methods, this study aims to identify the significant risk factors for start-up businesses in Malaysian SMEs. In-depth interviews were conducted with nine SME experts from East Coast Malaysia using a semi-structured questionnaire to answer the research question. According to Rabiee (2004), six to eight participants are sufficient for obtaining multiple perspectives. For this study, the sampling size was determined by the saturation concept. The saturation point is reached when no new information can be obtained with more data (Braun & Clarke, 2021). Afterward, the data gathered were analysed using Thematic analysis in Atlas.ti software developed by Takiyuddin et al. (2023). Table 1 below illustrates the seven steps involved in this study. It would have been different if we had conducted the observation in the laboratory (Abdul Rohim et al., 2023). After identifying the risk factors for start-up businesses in SMEs, the researcher determined the weightage for each category and risk factor using the Sankey Diagram and Code-Document Table in ATLAS. ti software. The weightage of each risk factors ranging from one (least significant) to five (most significant) were assigned based on ranking (Banda & Kumarasamy, 2020) developed from result Code-Document Table in ATLAS ti. Then, using the weightage, a general mathematical formulation of the risk management index for start-up businesses in SMEs was developed.

Table 1: Takiyuddin et al. (2023) seven steps of thematic analysis

Step	*Descriptions*
1	Uploading verbatim, video, or photograph as the primary document.
2	First-level coding: identifying the main construct or concept across the primary documents.
3	Second-level coding: reviewing code names and re-coding constructs or concepts as emerging themes and subthemes.
4	Naming themes and subthemes.
5	Identifying the association between themes and subthemes using the network diagram.
6	Preparing the quotation report and importing the network diagram.
7	Writing-finalising analysis.

4.0 Results

Following the completion of the data analysis procedure in Table 1, the study indicates that there are five major risk factors for start-up businesses in SMEs. There are Strategic Risks, Financial Risks, Operational Risks, Entrepreneurial Traits and Political Risks. Illustration and description of the risk factors of start-up businesses in SMEs found in this study are shown in Figure 1 and Table 2.

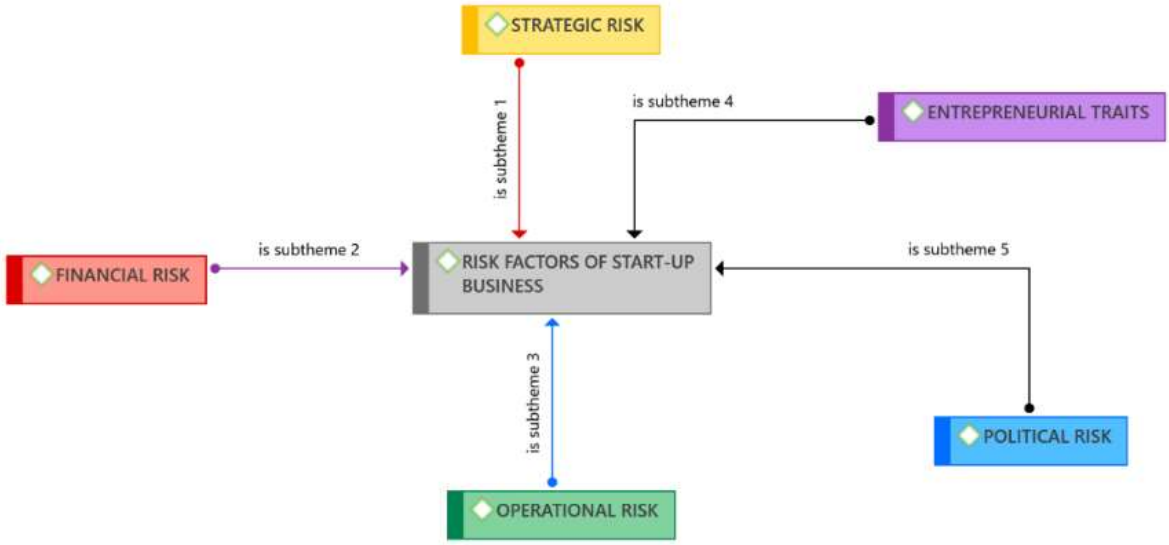

Figure 1: Risk Factors of Start-up Businesses in SMEs
(Source: Authors' elaboration, developed using ATLAS.ti)

Table 2: Description of Risk Factors of Start-up Businesses in SMEs

Subthemes	**Descriptions**
Strategic Risk	Strategic risk is the risk of potential failures in strategic planning, which may lead to a company not achieving its core objectives and risk related to the future.
Financial Risk	Financial risk refers to a business's ability to manage debt and fulfill financial obligations. It consists of two factors: external factors, including economic downturns and market/ industry changes, and internal factors, including underperformance, poor financial management, and bad investments.
Operational Risk	Operational risk is the risk of loss resulting from ineffective or failed internal processes, people, systems, or external events that can disrupt the flow of business operations.
Entrepreneurial Traits	Entrepreneurial Traits are entrepreneurial characteristics, beliefs, attitudes, and personalities, including knowledge, management skills, risk appetite, and risk tolerance.
Political Risk	Political risk is the risk that an investment's returns could suffer because of political changes or instability in a country.

(Source: Authors' elaboration)

In addition, the study discovered seven categories under strategic risk, six categories under financial risk, and four categories under operational risk, as illustrated in Figure 2. Under Strategic Risk, there are changes among customers/ in demand, reputational damage, competition, location, lack of marketing strategy, human resource issues, and lack of planning. Categories for Financial Risk are underperformance, economic condition, poor financial management, capital issues, cost pressure, and market/industry changes. Then, categories for Operational Risk are quality control process, production process, equipment failure, and logistics.

The Sankey Diagram in Figure 3 illustrates nineteen types of risks entrepreneurs face in start-up businesses in SMEs. The Sankey Diagram in Figure 3 below shows that entrepreneurial traits are the most prominent area conquered, indicating that participants mainly mention this risk factor. In contrast, the less area is logistics, followed by equipment failure, which indicates that only a few participants mentioned them. Eight participants discussed changes among customers/in demand as the second most prominent topic. There are almost similar-sized areas conquered by lack of planning and human resource issues.

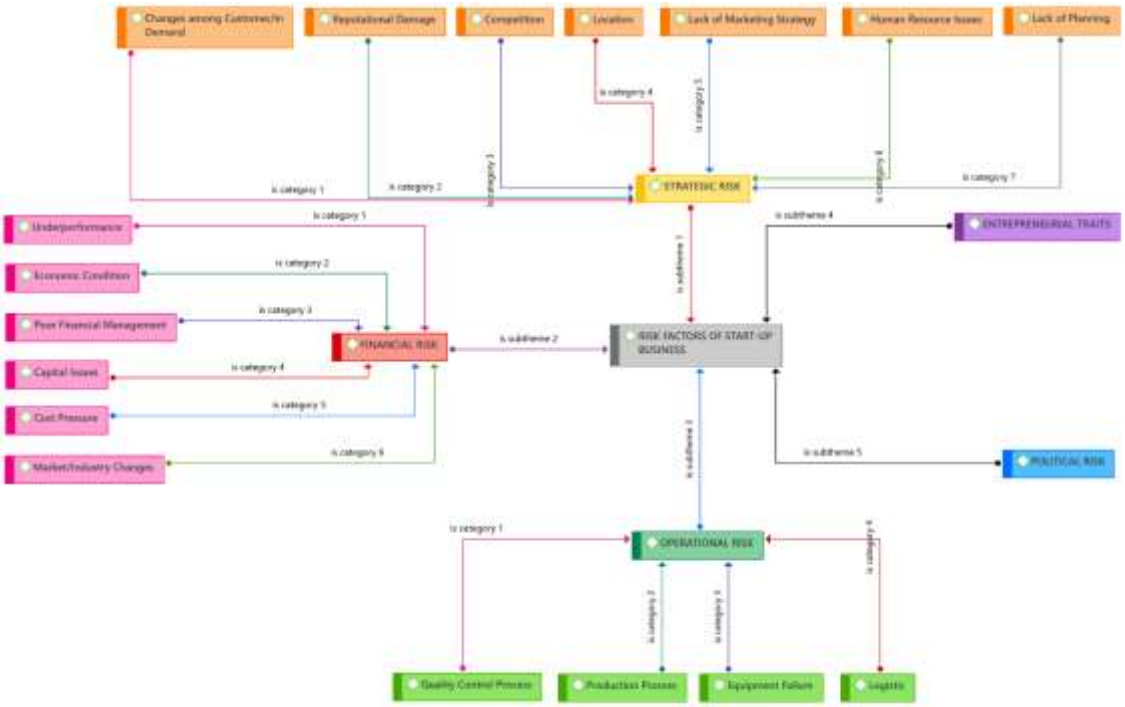

Figure 2: Major Risk Factors and their Categories
(Source: Authors' elaboration, developed using ATLAS.ti)

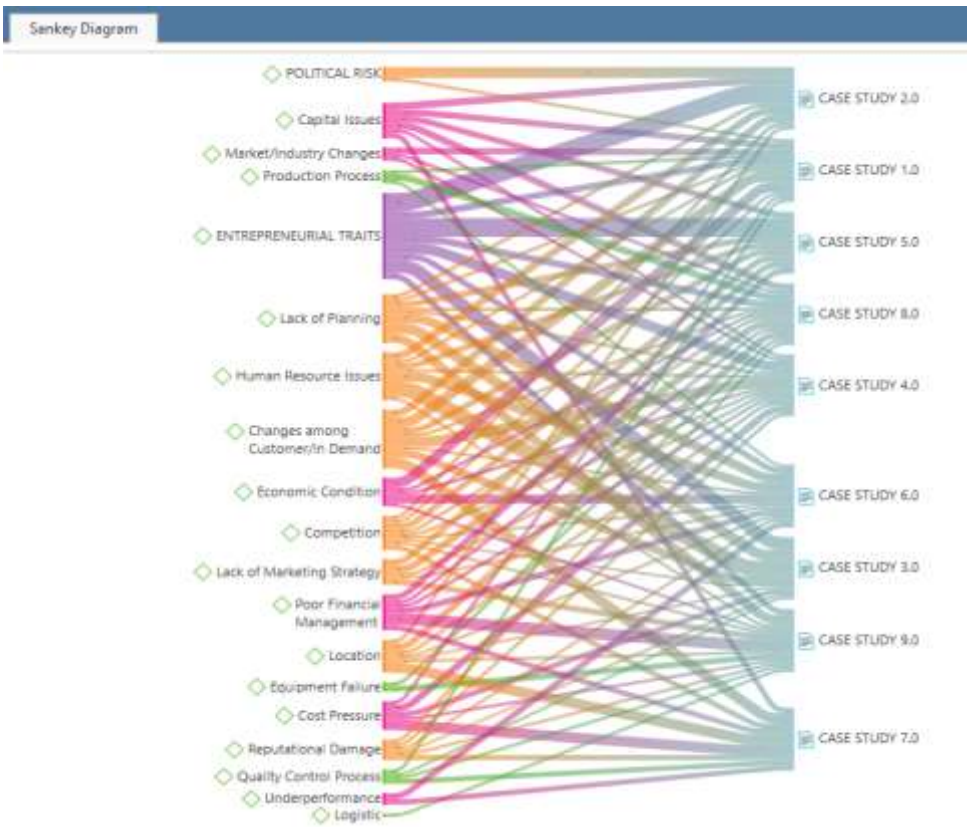

Figure 3: Sankey diagram
(Source: Authors' elaboration, developed using ATLAS.ti)

Next, we established a code hierarchy for all risk factors using Code-Document Table (CDT) Analysis. Figure 4 shows the results for start-up business risk factors in SMEs. Among the CDT Analysis table-relative frequency values, the highest relative frequency value is 33.02 for the Entrepreneurial Traits. Changes among customer/ in demand rank second with a total of 22.49, followed by lack of planning and human resource issues with relative frequency of 18.60 and 18.39, respectively. Then, it can be seen from the table below

that poor financial management is fifth-ranked, with a total relative frequency of 13.92. After that, capital issues and competition in the sixth and seventh-ranked with relative frequency is 13.75 and 13.03, respectively. Followed by them is the location with a total relative frequency is 12.70. Cost pressure with total relative frequency is 11.07, ninth-ranked. Next, the ranking goes to economic condition with a total relative frequency of 11.03.

Furthermore, seven codes are listed under lack of marketing strategy with a total relative frequency of 9.83 followed by reputational damage with six codes and a relative frequency of 7.95. Aside from this, the table shows four types of risk: market/ industry changes, political risk, production process, and quality control process, which have a similar number of codes which is 4. However, we ranked them according to relative frequency value, which resulted in this arrangement: political risk, quality control process, market/ industry changes, and then production process. The third last ranking of risk, according to Table 3, is underperformance, with a total relative frequency of 4.29, and the second last is equipment failure, with a total relative frequency of 3.62. Lastly, with a total relative frequency of 1.14, logistics ranked last. The summarisation of the ranking and total relative frequency for all risk factors of start-up businesses in SMEs according to CDT Analysis is shown in Table 4.

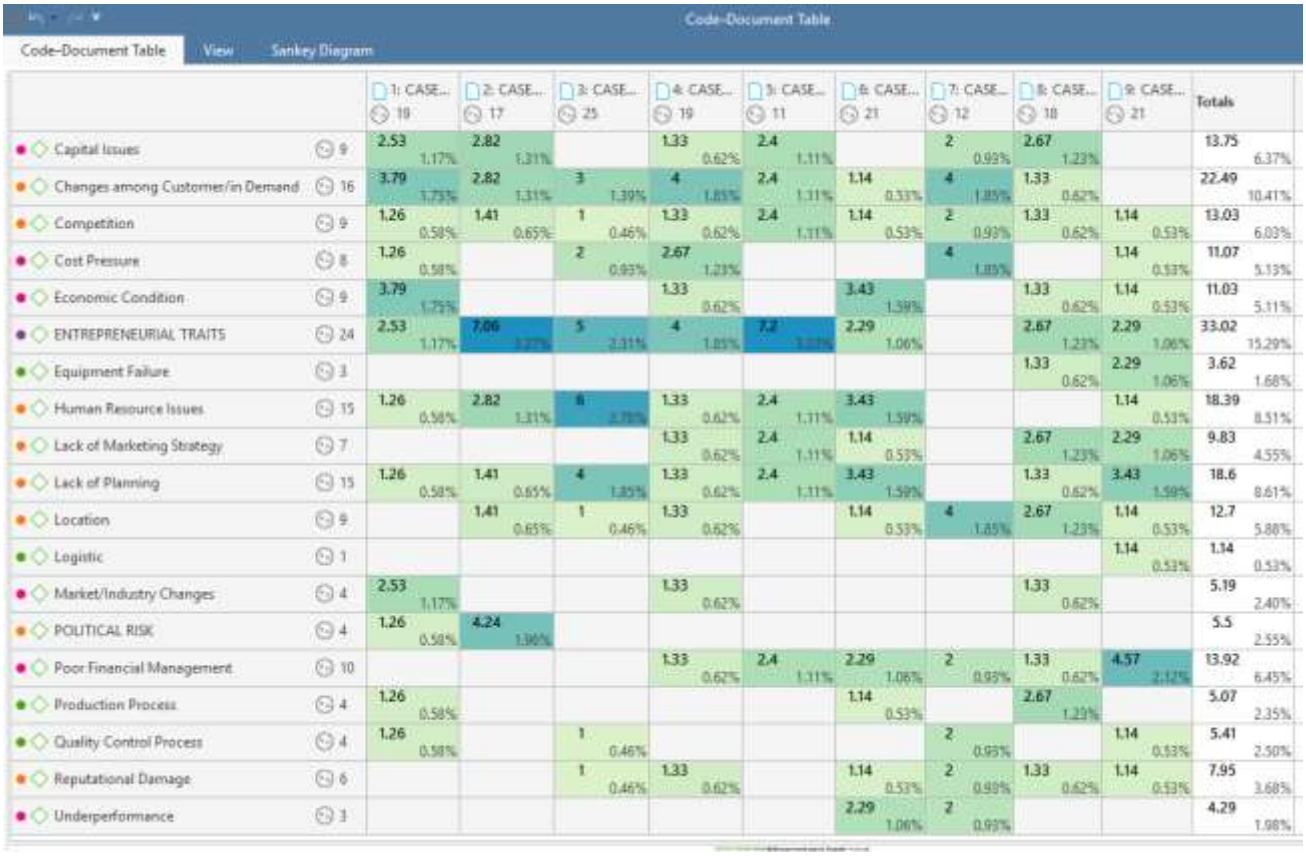

Figure 4: Code-Document Table
Source: Authors' elaboration (developed using ATLAS.ti)

Table 4: Ranking and Relative Frequency for Risk Factors of Start-up Business in SMEs based on CDT Analysis

Ranking	Risk Factors of Start-up Business in SMEs	Relative Frequency
1	Entrepreneurial Traits	33.02
2	Changes Among Customers/ In Demand	22.49
3	Lack of Planning	18.60
4	Human Resource Issues	18.39
5	Poor Financial Management	13.92
6	Capital Issues	13.75
7	Competition	13.03
8	Location	12.70
9	Cost Pressure	11.07
10	Economic Condition	11.03
11	Lack Of Marketing Strategy	9.83
12	Reputational Damage	7.95
13	Political Risk	5.50
14	Quality Control Process	5.41
15	Market/ Industry Changes	5.19
16	Production Process	5.07
17	Underperformance	4.29

18	Equipment Failure	3.62
19	Logistics	1.14

(Source: Authors' elaboration)

Based on Figure 4 and Table 4, the study reveals the most significant risk factor and the least significant risk factor. The risk factor with the highest relative frequencies and first ranking is considered the most significant. In contrast, the risk factor with the lowest number of relative frequencies and at the lowest ranking is considered the least significant. Thus, the study found that the most significant risk factor is Entrepreneurial Traits, and the least significant risk factor is Logistics.

Next, researchers developed the ranking and weightage for the main risk factors based on the result in Figure 1. As we can see in Table 4, the highest is Entrepreneurial Traits. Followed by changes among customers/ in demand. Referring to Figure 2, changes among customers are under Strategic Risk. Similar to lack of planning and human resource issues, which is in third and fourth ranking. Thus, researchers conclude that the second-ranked risk factor is Strategic Risk. The following human resource issues are poor financial management and capital issues, which are categorised under Financial Risk. Hence, the second-ranked is Financial Risk and then Political Risk. Operational risk is placed in the last ranking because the four categories under Operational Risk have less relative frequency value than Political Risk based on CDT analysis.

However, comparing Political Risk and Operational Risk, one participant in this study believed that Political Risk is the least risky among other risks. Participant 2 said:

"The lowest risk is a political situation because we cannot control it. Maybe there is a political risk in this business, but for other businesses, maybe they are not affected at all".

Besides, only two participants mentioned Political Risk compared to Operational risk. As illustrated in Figure 2, there are four categories under Operational risk, indicating that this risk element is critical and should be addressed. Thus, we placed Operational Risk at Fourth-ranked and Political Risk at Fifth-ranked in this study. The new ranking and weightage for main risk factors for Start-up Businesses in SMEs are summarised as shown in Table 5.

Table 5: New Ranking and Weightage for Main Risk Factors of Start-up Business in SMEs

Ranking	Risk Factors of Start-up Business in SMEs	Weightage
1	Entrepreneurial Traits	**5**
2	Strategic Risk	**4**
3	Financial Risk	**3**
4	Operational Risk	**2**
5	Political Risk	**1**

(Source: Authors' elaboration)

5.0 Discussion

The researchers found the most significant risk factor is Entrepreneurial Traits. It is in line with the Theory of Entrepreneurship by Mishra and Zachary (2015). The entrepreneurial process is not self-contained; the entrepreneur is an essential component of the entrepreneurial process. The role of the entrepreneur is central to most of the theories of firm formation (Mishra & Zachary, 2015). However, previous studies of risk management have not dealt with Entrepreneurial Traits. Participant 2 said:

"The highest risk is motivation. If you can't motivate yourself, then you can't go further…"

Besides, strategic risk is the second most significant risk factor. Jobo & Phyllis (2020) also agreed that Strategic Risk is one of the entrepreneurial risk management challenges within the maritime SMEs in South Africa. This is because strategic risk encompasses several distinct kinds of risks, such as risks related to management planning and decision-making, risks related to consumers and employees, and risks related to competition. It also encompasses the company's vision, mission, and goals. Participant 9 discussed how planning and research could affect product manufacture and quality.

"It is important for us to do research about our product to maintain the quality…. For product innovation, we must do the research and development to improve it… We must know our business goals and prepare a backup plan if anything happened during the early phase of our business operation… He must know his target market, business operation plans, and employee management"

In addition, many previous studies had focused on Financial Risk as one of the risks SMEs face (Ślusarczyk & Grondys, 2019). This indicates that Financial Risk should be highlighted by entrepreneurs in SMEs. This is consistent with our finding that most participants commented about this risk factor. Participant 4 agreed that Strategic Risk and Financial Risk are the highest risk factors in SMEs. She commented:

"The highest risks are employee and financial risks. The increase in material costs is the most crucial because we can't control it. And for employees, it plays with emotion…"

There are also several types of risks categorised under financial risks: short of capital, lacking sufficient or reserved capital, and difficulty obtaining a loan. All these risks required a better understanding and knowledge of financial management. As commented by Participant 9:

"Based on my experience, firstly, the financial risk. If we do not have enough knowledge of financial management, our business will not go further, and we will have a financial crisis….".

This study found that Operational Risk is the second last risk factor of start-up businesses in SMEs. It indicates that among all risk factors in this study, Operational Risk is the least significant compared to other risk factors. However, this is contradicted by a previous study which found that Operational Risk is the most studied by researchers (Ferreira de Araújo Lima et al., 2020), indicating the significance of this risk factor. This finding confirms that Operational Risk outweighs Political Risk. In addition, Operational Risk in this study includes four categories of risk, which are quality control, production, equipment failure, and logistics. This proves that Operational Risk is riskier than Political Risk. Even though only two participants mentioned Political Risk, this risk studied by many previous researchers indicates that we cannot ignore this type of risk (Oduoza, 2020).

In addition, the result of weightage for risk factors in Table 5 is essential for developing a new mathematical risk index for start-up businesses in SMEs. Using the fundamental mathematical formulation of a composite index, we can develop a mathematical risk index for start-up businesses in SMEs (Ghazali et al., 2023). The index number measures the change in one variable relative to a base value, whereas the composite index measures the change in two or more independent variables to create a broad and easy-to-use management effectiveness metric (Boyle et al., 2016). As can be seen from the formula of the index number and the composite index below, weightage was used in the composite index, not the index number. Previous index applications gave equal weights to different indicators (Cabello et al., 2021), which resulted in less accurate results. Each indicator has its own significance and weight. Thus, the weightage identified in this study has a very important role to play in developing the risk index formulation for start-up businesses.

Index Number,

$$I = \frac{Q_1}{Q_0 \times 100}, \ where$$

$Q_0 = Quantity\ at\ base\ time$

$Q_1 = Quantity\ at\ a\ given\ time$

Composite Index,

$$I = \sum (I_i W_i) \Big/ \sum W_n, \ where$$

$i = 1, 2, 3, 4, 5 \ and \ n = 1, 2, 3, 4, 5$

$I = index\ number$

$W = weightage$

Assuming that $\sum W_i = W_i$ (Al-Ahmad, 2020)

So that, the composite index of the general function of start-up business index for start-up businesses in SMEs is as follows.

$$\begin{aligned} I &= \frac{\sum (I_i W_i)}{\sum W_n} \\ &= \frac{\left[W_1 \sum (ET)_i + W_2 \sum (SR)_i + W_3 \sum (FR)_i + W_4 \sum (OR)_i + W_5 \sum (PR)_i\right]}{\left[W_1 + W_2 + W_3 + W_4 + W_5\right]} \\ &= \frac{\left[5\sum (ET)_i + 4\sum (SR)_i + 3\sum (FR)_i + 2\sum (OR)_i + 1\sum (PR)_i\right]}{\left[5 + 4 + 3 + 2 + 1\right]} \\ &= \frac{\left[5\sum_{i=1}^{n} a_i + 4\sum_{i=1}^{n} b_i + 3\sum_{i=1}^{n} c_i + 2\sum_{i=1}^{n} d_i + 1\sum_{i=1}^{n} e_i\right]}{15} \end{aligned} \quad (1)$$

Where

ET = Entrepreneurial Traits

SR = Strategic Risk
FR = Financial Risk
OR = Operational Risk
PR = Political Risk

a_i is the value of Likert scale answered by entrepreneurs' perspective regarding Entrepreneurial Traits faced by them, which consists of *n* items in the questionnaire.

b_i is the value of Likert scale answered by entrepreneurs' perspective regarding Strategic Risk faced by them, which consists of *n* items in the questionnaire.

c_i is the value of Likert scale answered by entrepreneurs' perspective regarding Financial Risk faced by them, which consists of *n* items in the questionnaire.

d_i is the value of Likert scale answered by entrepreneurs' perspective regarding Operational Risk faced by them which consists of *n* items in the questionnaire.

e_i Is the value of Likert scale answered by entrepreneurs' perspective regarding Political Risk faced by them which consists of *n* items in the questionnaire.

6.0 Conclusion& Recommendations

In this study, an attempt has been made to identify the risk factors of start-up businesses in SMEs and develop the weightage for each risk factor. It is found that there are five major risk factors of start-up business in SMEs. The weightage was developed as shown in Table 5. It is revealed that the most significant risk factor is Entrepreneurial Traits, and the least significant is Political Risk. Besides, it also revealed another risk category under Strategic Risk, Financial Risk, and Operational Risk. Table 6 demonstrates a summarisation of the ranking of main risk factors, their categories and weightage for main risk factors. This finding is important for entrepreneurs in SMEs, especially those who want to start a new business. Furthermore, this study provides novel insights regarding risk management and ERM, particularly for start-up businesses.

Table 6: Ranking and weightage for risk factors and their categories.

Ranking	Risk Factors	Categories of Risk Factors	Weightage
1	Entrepreneurial Traits	-	5
2	Strategic Risk	Changes among customer/ in demand Reputational Damage Competition Location Lack of marketing strategy Human resource issues Lack of planning	4
3	Financial Risk	Underperformance Economic condition Poor financial management Capital issues Cost pressure Market/ industry changes	3
4	Operational Risk	Quality control process Production process Equipment failure Logistic	2
5	Political Risk	-	1

(Source: Authors' elaboration)

In the future, a set of questionnaires will be designed for entrepreneurs to answer regarding the risk for their businesses. The results in Table 6 can be used as a guideline to construct the items in the questionnaire. Using this questionnaire, they will be able to measure the risk associated with their businesses. For answering questions regarding five major risk factors and their categories, a 10-point Likert scale will be used (see Figure 5). A high grade indicates a high degree of risk.

(Strongly Disagree) 1___ 2____3____4 ___ 5____6____7____8_____9____10 (Strongly Agree)

Figure 5: Likert Scale

In addition, additional investigation and research are thus recommended to validate the risk factor ranking and weightage results using techniques such as Fuzzy Delphi. The comparison of findings can provide better insights into the application of each strategy.

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Paper Contribution to Related Field of Stud

The findings of this research contribute to a new comprehension of risk factors in the risk management index for small and medium-sized enterprises (SMEs) and general mathematical formulation for the risk management index for start-up businesses in SMEs.

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