The possibility of evolution from non-strategic risk to strategic risk: The role of strategic assets

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Abstract. It is of great importance for the survival and development of an enterprise to effectively manage the risks based on the strategy. On the basis of combing the relevant literature, this paper redefines strategic risk and non-strategic risk, discusses the measurement of the possibility of non-strategic risk evolving into strategic risk by introducing strategic assets, and puts forward the opportune moment of management for strategic risk. The study suggests that strategic assets play an important role in the evolution of non-strategic risk into strategic risk. In order to improve the effectiveness of management, enterprises should start strategic risk management when the risk is still non-strategic rather than has evolved into strategic risk. Big data analysis method and artificial intelligence technology can help enterprises calculate the probability of non-strategic risk evolving into strategic risk and grasp the opportunity of strategic risk management.

1. Introduction
Some small events may turn into a big crisis, which will bring huge losses to the enterprise, and even make the enterprise lose the opportunity to survive. When people analyze these event, they tend to be attributed to such factors as weak supervision, weak sense of responsibility, etc., but the most important reason may be that enterprises do not carry out strategic management or effective strategic management on the risks they face.

Strategic risk management is to manage the risks of the enterprise based on the strategic perspective, and mobilize the resources and capabilities of the enterprise to eliminate those factors that lead to the non-strategic risks evolve into strategic risks[1-2]. Effective management for strategic risk must solve two problems. The first problem is how to choose non-strategic risks. The non-strategic risks faced by enterprises constitute a big data set. How to select the risk that is likely to change from non-strategic risk to strategic risk? The second problem is how to determine the strategic risk. Which risks can be called strategic risks? This paper studies the evolution of non-strategic risk to strategic risk and the determination of strategic risk from the perspective of strategic assets, and proposes the timing of intervention of strategic risk management.

2. Literature review
It is generally believed that the concept of strategic risk was first proposed in the field of management from the decision theory, and its initial meaning is the risk brought by strategic decision[3]. Scholars' research on strategic risk is mainly carried out from the following aspects: the concept and characteristics of strategic risk, the composition and measurement of strategic risk.
Although there are many literatures on the concept of strategic risk, the definition of the concept of strategic risk and the main research methods of strategic risk have not been unified. Of course, this also provides impetus for the increase of strategic risk knowledge. Baird points out that a complete concept of strategic risk should include all reasonable definitions of risk after analyzing the definition of risk in the fields of finance, market, psychology, crisis management and previous strategic management[4]. At present, the differences in the definition of strategic risk mainly focus on whether strategic risk is a strategic risk or a risk of strategy[5]. The author tends to the former. In fact, if the implementation of strategy is regarded as an enterprise's behavior, the risk of implementing strategy will be strategic and unified under the strategic risk.

The risk has the characteristics of loss, uncertainty and dynamic, which are often used to define risk. As a kind of risk, strategic risk must have these characteristics. In addition, it also has the basic characteristics of subjectivity and manageability. The manageability of strategic risk seems to excite managers, but in reality, there are often cases of crisis or even bankruptcy caused by the lack of effective management of strategic risk. It is not necessarily correct to think that the ability of large-scale enterprises to resist risks is stronger than that of small enterprises and infer that the objective risks are smaller in the eyes of relatively large enterprises[6]. For enterprises, the most important thing is to confirm what the risk is and whether the risk is effectively managed from the strategy.

Strategic risk has different components in different researchers' research. Budd thinks that strategic risk consists of entrepreneurial risk, operational risk and competitive risk in the multidimensional model of strategic risk system[7]. Therefore, the strategic management of risk must solve the problems of entrepreneurship, engineering technology and market. Slywotzky classifies strategic risk into technology risk, new product risk, customer risk, brand risk, competition risk, industrial economic risk and market stagnation risk[8]. These studies on the composition of strategic risk can help managers understand the source of strategic risk, but they can't explain why a small operational risk turns into strategic risk when a product or business process makes a serious mistake. In fact, products and processes based on resources and capabilities are strategic assets of an enterprise. The author believes that when a small risk is highly related to the strategic assets of an enterprise, it is more likely to evolve into strategic risk. Therefore, in the study of the evolution from non-strategic risk to strategic risk, the recognition of strategic assets is the premise of effective management of strategic risk.

The measurement technology of strategic risk can help managers to make quantitative analysis of the strategic risk faced by enterprises. Compared with other management fields, the research on risk in financial field is relatively early, and there are many methods to measure risk[9]. Capital asset pricing model (CAPM) is often used to measure the strategic risk of enterprises. In fact, the risks in the financial field are generally not classified according to the strategic and non-strategic risks, but classified into the systematic and non-systematic risks. The reason is that the main consideration in the financial field is the decentralization of risks rather than the strategic problems of risks. Of course, there are also researchers who consider the strategic risks in the financial field and classify them as systematic risks and non-systematic risks[10]. In addition, a series of methods based on value at risk (VaR) in the financial field are often used to measure the risk of enterprises[11]. It is obvious that the method of measuring the risk in the financial field applied to the measurement of the strategic risk of enterprises is insufficient, because the strategic risk of enterprises is very different from the financial risk.

In the measurement of strategic risk, a method called change is widely used because of its simplicity[5]. Its essence is to use the change characteristics of specific variables (such as variance or standard deviation) to estimate the strategic risk level of an enterprise. The estimation object can be either the whole enterprise or the strategic business unit of an enterprise, and the most commonly used variable is revenue type index. This method will derive many specific methods along with differences in change characteristics and preferences of indicators selected by researchers. Of course, the diversity of specific methods brings benefits to researchers as well as disadvantages, because different specific methods do not have the same assessment results on the strategic risk of the same object. Moreover, the results of using this method to evaluate strategic risk may exaggerate the risk or not find the risk,
because predictable changes and the use of historical data to evaluate risk do not focus on the uncertainty as the essential characteristics of risk.

Collins and Ruefli developed an ordinal method to measure strategic risk, and used it to measure the strategic risk of American aviation industry[12]. Later, they developed the technology into a state determination method to measure strategic risk. This method takes the competitive position of an enterprise as a state. The change of the state is described by the change of the competitive position. The decline of competitive position and the extent of decline reflect the strategic risk of enterprises. The calculation of strategic risk is based on the state transition probability matrix. In practice, the challenge of this method is to measure the competitive position and the availability of data, because it needs to use the relevant data of other enterprises in the industry when measuring the strategic risk of an enterprise.

Many scholars have also carried out in-depth research on the relationship between strategy and risk, the relationship between strategy risk and the overall income of the enterprise, and obtained many meaningful but not completely unified conclusions. Bowman's study points out that in most industries, there is a negative correlation between risk and return, which means that high risk does not necessarily have high return[13]. However, research by Aaker and Jacobson shows that there is a strong positive correlation between earnings and system risk, while the positive correlation between earnings and non-system risk is weak, which means that high risk brings high earnings[14]. Later, Maurer reexamined Bowman's return paradox by using the ordinal method to measure strategic risk. His conclusion did not simply agree with or oppose the paradox, but reinterpreted the paradox. Finally, he came to the conclusion that when reducing the strategic risk of the company, shareholders' wealth was maximized, which seemed to be a new paradox[15].

In recent years, how to effectively manage the strategic risk of enterprises has become the focus of strategic risk research. Woodard introduces a new profit and loss model of strategic risk management, which comprehensively discusses risk management and emphasizes the importance of risk identification and measurement in the process of strategic risk management[16]. Hopkins Studies the organizational problems in strategic risk management, and believes that using different institutions with different risk management capabilities to manage different types of risks can change the distribution of risks[17]. Other studies examine strategic risk management from the perspective of the responsibilities of top managers and the coordination among various departments[18].

Although the study of strategic risk has a history of more than 30 years, it is far from the formation of a generally accepted understanding. It is believed that various views are still in a jungle state, and the systematic management of strategic risk has not been effectively solved. This paper will study the evolution from non-strategic risk to strategic risk from the perspective of strategic assets.

3. The possibility of evolution from non-strategic risk to strategic risk

3.1. Risk, strategic risk and non-strategic risk

The most basic definition of risk is the uncertainty of future loss, but this uncertainty refers to the uncertainty that future loss may or may not occur, or the uncertainty of its loss size if future loss occurs, or both of them have meanings. The author thinks that it is not accurate to define risk by the uncertainty of future loss, because the loss is caused by other uncertain events. For example, a car manufacturer faces the risk of rising steel price, which means that if the steel price rises, it will bring relative losses to the enterprise. The relative loss here refers to the uncertainty of the price rise, which is not reflected in the uncertainty of the loss, but in the uncertainty of the steel price rise. The rise of steel price is a more direct event that may or may not happen. It is uncertain. The uncertainty of loss is caused by it. Therefore, risk should be defined by uncertain events.

In this paper, a risk is defined as a random event which will bring loss to the enterprise if it occurs. Obviously, a risk must be a random event, but a random event is not necessarily a risk, and the risk is a random event with a certain nature. For example, the rise of steel price is a risk for one enterprise and not a risk for another, even though it is a random event. Similarly, strategic risk can be defined as a
random event which will bring great or overall loss to the enterprise if it occurs. Further, non-strategic risk is the risk which is not strategic risk, or can be defined as a random event which will only bring small or local losses to the enterprise if it occurs.

Non-strategic risk may be transformed into strategic risk, or it may be further transformed into crisis. Crisis can be regarded as the end of strategic risk, and the relatively early non-strategic risk can be called the front of strategic risk. When an enterprise is facing a crisis, it must carry out crisis management. Before the crisis, risk management is the management of all kinds of random events that may bring losses to the enterprise. The effective management for strategic risk is to keep the enterprise in a small risk state, so that the strategic risk of the enterprise does not occur.

3.2. Strategic assets
Strategic assets will play an important role in examining the transition from non-strategic risk to strategic risk. Strategic assets refer to the combination of unique resources and capabilities of an enterprise. Owning strategic assets is the precondition for an enterprise to gain future competitive advantage. In order to succeed in the competition, what kind of key resources and capabilities are necessary for the enterprise? This is not only an important issue in the strategic practice of enterprise managers, but also the focus of strategists’ strategic research. In order to explain this problem, scholars put forward many ideas based on company resources, such as core competitiveness, key success factors and so on. However, most of these ideas or their application focus on the internal resources and capabilities of the enterprise, or on identifying the important capabilities of the enterprise in the past rather than the capabilities needed by the enterprise in the future. Obviously, in a rapidly changing global competitive environment, it is very important for an enterprise to recognize the capabilities it needs in the future and focus on cultivating these capabilities for its sustainable competitive advantage. Strategic assets is a concept put forward by combining internal resources and capabilities with external competitive environment and key success factors.

Enterprises must choose strategic assets. An enterprise’s choice of strategic assets mainly includes two main stages. The first stage is to analyze the strategic situation from the outside to the inside, and analyze the strategic business areas that enterprises may participate in the competition in the future, so as to determine the strategic industry elements that enterprises need in different competition situations. The second stage is to analyze the competitive relationship between the participating enterprises, and at the same time considers the situation of the first stage to select the strategic assets needed by the enterprises.

3.3. The evolution from non-strategic risk to strategic risk and strategic risk management
According to the above definition of risk, the evolution of risk refers to the process from one risk or a series of risks to another, or it can be expressed as the process of initiating or evolving from one or a series of events to another or a series of events. The evolution from non-strategic risk to strategic risk is a process of initiating or evolving from a non-strategic risk or a series of non-strategic risks to one or a series of strategic risks, or it can be expressed as a process from one or a series of events that bring small or partial losses to the enterprise to one or a series of events that bring large or overall losses to the enterprise.

How to measure the possibility of evolution from non-strategic risk to strategic risk? Now $F_A$ and $F_B$ are used to represent the set of all non-strategic risks and strategic risks faced by an enterprise at $T_0$. Let non-strategic risk $A_1, A_2, \ldots, A_n$ be the elements of $F_A$, and let strategic risk $B_1, B_2, \ldots, B_m$ be the elements of $F_B$. Then all possible evolution from non-strategic risk to strategic risk in the period from $T_0$ to $T_1$ is shown in Table 1. In order to simplify the problem, table 1 only considers the situation that one risk evolves into another rather than a series of risks. For example, $A_i \rightarrow B_j\,(i=1,2,\ldots,n, j=1,2,\ldots,m)$ means that a non-strategic risk $A_i$ evolves into a strategic risk $B_j$. 
Table 1. Evolution from non-strategic risk to strategic risk.

| non-strategic risk | B₁ | B₂ | ... | Bₘ |
|-------------------|----|----|-----|----|
| A₁                | A₁ → B₁ | A₂ → B₂ | ... | A₁ → Bₘ |
| A₂                | A₂ → B₁ | A₂ → B₂ | ... | A₂ → Bₘ |
| ...               | ... | ... | ... | ... |
| Aₙ                | Aₙ → B₁ | Aₙ → B₂ | ... | Aₙ → Bₘ |

The probability of $A_i \rightarrow B_j$ is measured by the probability $P(B_j|A_i)$ of $B_j$ under the condition of $A_i$. The total probability formula and Bayes formula can be used to calculate $P(B_j|A_i)$. But when $P(B_j|A_i)$ is calculated, it will face the problem of non-strategic risk of big data, which makes a lot of conditional probability $P(B_j|A_i)$ need to be calculated. The solution is to first examine the strategic assets of an enterprise, and then examine whether the risk $A_i$ in the non-strategic risk set $F_A$ is highly related to the strategic assets. If it is highly correlated, the risk $A_i$ is called a strategic event. Obviously, strategic events are only a few events in the non-strategic risk big data set $F_A$. When $A_k (k ≤ n)$ is used to represent all strategic events, calculating $P(B_j|A_k)$ becomes calculating $P(B_j|A_k)$. In this way, the amount of calculation will be much less, and it is possible to calculate the probability of evolution from non-strategic risk to strategic risk.

Because the non-strategic risk may evolve to the strategic risk, the enterprise must carry on the risk management based on the strategy to each link which may evolve. The key of management is to determine the degree and the timing of strategic management intervention according to $P(B_j|A_k)$. Figure 1 shows the timing of interventions of strategic risk management.

![Figure 1. Strategic risk management opportunity.](image)

As shown in Figure 1, strategic management should not only intervene when strategic risks appear, but also move forward to the front of risk evolution. Strategic management should be carried out in case of non-strategic risks. As there is a possibility that non-strategic risk may evolve into strategic risk and then further evolve into crisis, moving forward strategic risk management to non-strategic risk will help to increase the effectiveness of strategic management. In the specific risk management, big data analysis and artificial intelligence technology can help enterprises calculate the probability of non-strategic risk to strategic risk evolution and accurately grasp the opportunity of strategic risk management.

4. Conclusion
Non-strategic risks do not always evolve into strategic risks, but non-strategic risks highly related to strategic assets are likely to evolve into strategic risks. Therefore, it is of great significance to examine the possibility of non-strategic risk evolving into strategic risk by examining strategic assets.

In order to improve the effectiveness of strategic risk management, strategic risk management should start from the front of risk evolution. First of all, the enterprise should analyze the general
events to help select the non-strategic risks, then determine the strategic events based on the strategic assets of the enterprise, then calculate the probability that the strategic events evolve into strategic risks, and finally, propose strategies on risk management and carry out strategic risk management. The most important thing is that strategic risk management does not only appear at the end of risk evolution from non-strategic risk to strategic risk, but should start to intervene from the beginning when non-strategic risk appears. Strategic management should run through the whole process of risk evolution rather than only aiming at strategic risk. In this process, strategic assets play an important role. Big data analysis and artificial intelligence technology can be applied to help enterprises manage strategic risk.

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