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Application Direction of Nano-Material Composite Technology and Investment Risk Management

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Abstract: Compared with other materials, nanomaterials have excellent performance. After they are processed by composite technology with other materials, their performance is even better, and their plasticity, high temperature resistance, and water resistance are greatly enhanced. They are widely used in aerospace. , Transportation, electrical and electronic fields. Nano-material composite technology belongs to the high-tech field, which requires high preparation technology and enterprise strength, and belongs to the field of high investment risk and high return. In order to better understand the relationship between the application of nanomaterials composite technology and investment risk, and to reduce investment risk, the author uses this topic as a key word, and uses electronic databases such as Wanfang, HowNet, and Weipu to collect and analyze relevant domestic and foreign documents And finishing. Through the identification of the investment risks of the nanomaterials composite technology industry, and through the corresponding models, the investment risks of the nanomaterials composite technology industry are analyzed, and risk prevention strategies are proposed to explore the reasons for the investment risks of the nanomaterials composite technology industry. The management and control of the investment risk of nanomaterials composite technology is analyzed theoretically. The research results show that the application of nano-material composite technology in different countries is different. The particle size of nano-material composite technology and the application direction of nano-material composite technology will affect investment risk. The smaller the material particle size, the lower the risk. When the particle size is 5nm, The lowest risk; the more sophisticated the application of nano-material composite technology and the fewer competitors, the lower the investment risk.

1. Introduction

With the rise of the application of nanomaterials in the early 1990s, the application technology of

nanomaterials has brought people rich and colorful changes, and people have begun to understand nanomaterials in a real sense [1]. In recent years, with the continuous development of science, the types of nanomaterials have been widely expanded, including the familiar activated carbon, diamond, and new materials such as carbon nanotubes, fullerenes and grapheme [2].

Nano-materials composite technology has been developed so far, and great achievements have been made at home and abroad. With the continuous extension and development of the industrial chain, many achievements have been made, and they have made contributions to the construction of the national economy [3]. However, the development of the nanomaterials industry is accompanied by the existence of investment risks in the industry. As we all know, nanomaterials projects favor investment projects with great development potential, usually used to help a new technology or business idea to achieve commercialization and industrialization, and finally obtain corresponding investment income [4].

In 1963, the book "Enterprise Risk Management" was published in the United States, which attracted widespread attention from European and American countries [5-6]. Since then, the research on risk management gradually tends to be systematized and specialized, making risk management gradually become an independent specialized subject. In developed countries such as Europe and the United States, the scope of application of project management has spread from the initial defense, aerospace, and construction sectors to the medicine, chemical, and mining sectors [7-9]. As the role of risk management becomes more and more prominent, developed countries in Europe and the United States also pay more and more attention to risk management, and have established risk management institutions, which are responsible for risk analysis and research. The United States has also established a nationwide risk research institute and the American Association for Risk Management and other academic groups that specialize in business enterprise risk management. With the establishment of risk management teams and related associations, risk management is also playing an increasingly important role in various fields.

There are many researches on nano-material composite technology at home and abroad. Wu Weize uses alcohol-water exchange and supercritical drying to prepare composite nano-materials, and studies the preparation of nano-material composite technology [10]; Huangbin’s research on nano-material composite technology Application analysis, and studied the role of nano-material composite technology in aquaculture and the water environment [11]; Zhang Baode studied the role of nano-material composite technology in automotive materials, and made a comment on the development trend of nano-material composite technology. Forecast: Ge Jun researched the industrialization of nanomaterials composite technology, and analyzed the domestic R&D and market status of nanomaterials composite technology to make a detailed analysis, and also researched the investment value of nanomaterials composite technology [12]. These studies have promoted the development and investment of nanomaterials composite technology in our country to a certain extent, but there are also shortcomings. On the whole, research at home and abroad basically focuses on the research of nanomaterials composite technology. For its application direction and investment risk the research on the interrelationship is relatively lacking.

This paper constructs an index system for measuring the application level of nanomaterials composite technology, which includes the application direction of nanomaterials composite technology and the particle size of nanomaterials composite technology, and uses dynamic factor evaluation method to measure. Then, it was connected with the investment risk of nano-material composite technology companies to examine the relationship between the application direction of nano-composite technology and investment risk, and initially explored the relationship between the application direction of nano-material composite technology and investment risk. It can enrich

current scholars' relevant research on investment risks in the nanomaterial composite technology industry, and has certain theoretical research significance.

2. Proposed Method

2.1. Nanomaterials Composite

At present, there are many preparation methods for nanomaterial composites, each with its own advantages and disadvantages. On the whole, the three most commonly used preparation methods are as follows:

(1) Gas phase method

The gas phase method converts solids into gases or uses precursor gases, and then physical or chemical reactions occur in the gas state to finally form low-dimensional nanomaterials [13]. To heat a solid to a gas state, generally speaking, high-frequency induction, plasma or laser heating can be used. The vapor phase method includes physical vapor deposition method and chemical vapor deposition method. Nowadays, using the gas phase method, it is possible to prepare related products such as nanobelts, nanorods, nanowires, etc.; including II-VI group semiconductors (CdS, ZnS, ZnO, CdO) and other related products.

(2) Liquid phase method:

1) Hydrothermal method means that under atmospheric conditions, a substance that is insoluble or insoluble in water dissolves or reacts in a high temperature and high-pressure water environment to form a dissolved product of the substance and make it reach a certain degree of supersaturation for reprocessing the crystallization method [14]. In the hydrothermal method, the role of water is to create a high-pressure environment and dissolve or partially dissolve the reactants. Due to the increased activity of the reactants under hydrothermal conditions, this method can replace part of the solid-phase reactions that require high temperatures. In the hydrothermal reaction, by adjusting the reaction temperature, pressure, solution concentration and other conditions, the synthesis of nanomaterials with different sizes and morphologies can be controlled. The morphology and performance of nanomaterials synthesized in the same environment have great uniformity. The solvent method is developed on the basis of the hydrothermal method. A synthetic process in which an organic or non-aqueous solvent is used as a solvent and the original mixture is reacted in a closed system at a certain temperature and autogenous pressure of the solution. Method. It differs from the hydrothermal reaction in that the solvent used is an organic substance instead of water.

2) Sol-Gel method (Sol-Gel) is to use inorganic substances or metal alkoxides as precursors, mix these raw materials uniformly in the liquid phase, carry out hydrolysis and condensation chemical reactions, and form a stable transparent sol in the solution System [15-16]. After the sol ages, the colloidal particles slowly polymerize to form a three-dimensional network structure of the gel, and the gel network is filled with solvents that lose fluidity to form a gel. The gel is dried, sintered, and solidified to prepare molecular and even nanostructured materials. In the case of low temperature, it can also prepare single-component and multi-component mixtures (molecular-level mixing) with high purity, uniform particle size distribution and high chemical activity. In addition, it can also be prepared that cannot be prepared by traditional methods. Or products that are difficult to prepare.

(3) Solid-phase reaction method

The solid-phase method is a method of refining or reacting original crystals to generate nanocrystals without melting or vaporizing [17]. The solid-phase reaction method refers to a method in which one or more solid-phase substances are synthesized or decomposed to generate nanomaterials under the action of heat, electricity or mechanical energy. The typical application of

the solid-phase reaction method is to fully mix metal salts or metal oxides in a predetermined ratio, grind and then calcinate, directly prepare ultra-fine powder through the synthesis reaction, or pulverize again to obtain nano-powder. The solid-phase method has simple equipment. However, the resulting powder is easy to agglomerate and usually requires a second crush.

2.2. Application Direction of Nano Material Composite Technology

Nano-material composite technology has a wide range of applications at home and abroad. At present, as a whole, the domestic application mainly includes the following aspects:

(1) In food safety testing, compared with traditional chemical analysis methods, thin layer chromatography, high performance liquid chromatography, etc., immunoanalysis methods using nanomaterial composite technology as markers do not require complicated experimental procedures With operating procedures and expensive instruments, it has the advantages of simple preparation, simple characterization method, and high detection sensitivity, which is suitable for on-site rapid detection [18]. Currently mainly used in: pesticide/veterinary drug residue detection, pathogenic microorganisms (such as: Salmonella, foot-and-mouth disease virus, Staphylococcus aureus, etc.) detection, biotoxin detection, heavy metal ions (such as: copper, lead, mercury, nickel, cadmium) Detection.

(2) In the field of biomedicine, the many advantages of nanomaterial composite technology, such as excellent capacity, photoelectric properties, anti-oxidation and good density, make it have broad application prospects. After surface modification, particles can play a very important role in cell imaging, drug carriers, etc. based on their structure, morphology, scale, etc. [19-20].

1) In the application of biomolecule detection and identification, due to the surface plasmon resonance effect, high density and catalytic properties of nanomaterial composite technology, the immune technology using nanomaterial composite technology as a marker has become the world's top technology One, compared with other markers, it has a remarkable European standard in the field of bioassays, and it has huge application potential in the early diagnosis of tumors.

2) In terms of cell imaging, nano-material composite technology particles with a particle size greater than 20nm have strong scattering properties and are easily observed by dark-field scattering microscopes. Compared with other fluorescent substances, their scattered light can be stable for a long time; Coupled with its surface plasmon resonance effect, molecular electromagnetic field signals can be enhanced. These have excellent advantages in bioimaging technology, especially in intracellular imaging with very large application potential [21].

3) In the field of photothermal therapy, due to its own characteristics, nanomaterial composite technology will produce related reactions when encountering near-infrared light, and produce photothermal reactions, which enables it to play a significant role in medical photothermal therapy.

4) In terms of drug delivery and controlled release, due to the large specific surface area of nanomaterials, it is easy to modify, through the action of chemical bonds and non-chemical bonds, drugs are easily bound on the surface of nanomaterials [22-23]. At the same time, the nanomaterial composite technology drug delivery system can also reduce the number of drugs used, increase the stability and activity of the drugs, reduce cytotoxicity, and increase the solubility of drugs, thereby reducing medical costs, and has great applications in the field of tumor treatment. potential.

(3) In terms of optical devices, nano-material composite technology can also play a very important role. Nano-material composite has great advantages due to its excellent nonlinear response and tertiary nonlinear sensitivity. Doping nanocomposites into the carrier can enhance the three-level nonlinear sensitivity of the material. As the size of the nanoparticle decreases, the

relaxation time will increase significantly, such as a glass carrier. Such as polymer carriers, thiol complexes or silicon pores, etc. [24], the addition of nanomaterial composite technology will change the nonlinear optical properties differently, which can satisfy the preparation of nonlinear optical devices.

2.3. Risk Assessment

Risk assessment refers to the work of quantifying the impact and loss that the event may have on people's lives, lives, property and other aspects before or after the occurrence of a risk event (but not yet over) [25-26]. Generally, there are the following several evaluation methods:

(1) Scenario analysis is a method that assumes that a certain phenomenon or a certain trend will continue into the future and predicts the likely occurrence or consequences of the predicted object. It is usually used to make various assumptions or predictions about the future development of the predicted object, and it is an intuitive qualitative forecasting method. Scenario analysis is usually used to control risk. The global financial crisis occurred in 2008. Regulatory agencies in various countries have used scenario analysis to analyze possible risk scenarios and formulate more targeted response plans to ensure that financial institutions can still withstand risks under different risk conditions.

(2) Expert consultation method, that is, consulting experts on the feasibility of the project from the risk control research experts of nanomaterials composite technology, and fully listening to their opinions and suggestions. This is a simple and direct way to understand project risk data. The first is to analyze the risk indicators of the Nanomaterials and Composite Technology Institute, and determine the weight ratio of each indicator according to the degree of influence, influence and influence of the indicators; secondly, to listen to experts to classify the various risk indicators of the Nanomaterials and Composite Technology Institute Opinions, determine the public grade; the third is to calculate the total score of the risk of the Nanomaterials and Composite Technology Research Institute, the higher the risk, the larger the score, and the relatively poor feasibility or controllability. Generally speaking, after long-term practice and research, experts and scholars have rich experience and certification views, which can bring important feasibility guidance for project risks; but because the research angles of experts are different, and they are in project risk assessment and analysis. There will be more or less personal subjectivity and limitations in the process. Therefore, the reliability or feasibility of the project needs to be further combined with internal and external environmental and scientific analysis methods such as social and economic development to further confirm

(3) The analytic hierarchy process, the project risk of the Nanomaterials Composite Technology Research Institute is more complicated. First, the risk factors can be classified and the people can be aggregated to form a risk level by combining the analysis views and data of experts. Secondly, after the risk levels are arranged, the consistency test can be carried out through the level ranking. Through this hierarchical analysis, it has a great reference value for the risk assessment of the Nanomaterials and Composite Technology Research Institute.

(4) Fuzzy mathematics method is suitable for many affected factors, and the overall risk is calculated according to the following acceptable range, which has a certain scientific nature for the guidance of project risk control. In the risk evaluation of the Institute of Nanomaterials and Composite Technology, the overall risk score can be calculated based on the data after the analytic hierarchy process and the fuzzy mathematical evaluation, and the risk judgment can be made accordingly.

2.4. Investment Risk Management

Investment risk means that due to the uncertainty of the future, it is affected by a variety of factors and is changing. The return on investment and the principal may be lost and there are risks. The risk taken in order to obtain uncertain expected returns [27]. It is also a kind of business risk, which usually refers to the uncertainty of the company's investment expected rate of return. As long as the risks and returns are unified, investment behavior can be effectively regulated.

Investment risk is the performance of risk phenomenon in the investment process. Specifically, investment risk refers to the deviation between the actual investment income and the expected return due to uncontrollable factors or random factors from the beginning of the investment decision to the end of the investment period. The deviation between actual investment income and expected return may be that the former may be higher than the latter, or may be lower than the latter, that is, both economic losses and additional income may be obtained. They can all directly reflect the situation of investment analysis.

The occurrence of risk events is the result of the interaction of multiple risk factors. The random combination of risk factors related to risk events reflects the uncertainty of project investment risks. Some systemic factors, such as industry policy adjustments and commercial competition, can predict the reasons for their occurrence, but it is difficult to predict the exact time point of occurrence. The unpredictability of risk factors leads to uncertainty in investment risks.

Risk monitoring is divided into regular monitoring mechanism and irregular monitoring mechanism according to the monitoring method; the participants under the monitoring mechanism should include investment links, market links and risk control management departments, and have an appropriate way to report to the decision-making level in real time. Periodic monitoring should include all aspects of business operations, highlighting active management methods. The investment link monitors the proportion of cash retained in the company's daily investment, the realisability of assets and market changes, and promptly activates relevant emergency mechanisms when liquidity risks appear. The investment link confirms the liquidity risk level and feeds it back to the risk management department. The risk management department comprehensively confirms the liquidity risk level based on the information feedback and initiates the corresponding plan. The irregular monitoring mechanism is a mechanism by which each functional department reports to the person in charge of the work unit when it is determined that there is a possibility of liquidity risk based on the information collected in daily work and makes a comprehensive judgment. Unscheduled monitoring mechanism is an important preventive method to deal with emergencies or market fluctuations, to make up for situations that cannot be accurately identified and measured by regular monitoring mechanisms. If it is impossible to clarify the level of liquidity risk in the early warning of possible liquidity risks under the irregular monitoring mechanism, interim decision-making meetings should be held in each link to clarify which response measures to initiate.

Overall, most of the current enterprise risk management in the market has the following problems:

1) Information on risk management lacks communication. There are many links involved in risks, and there is much information. It is necessary to share information to prevent risks more effectively. For the investment department, legal and compliance department, risk management department, finance department, marketing department and other departments, they need to share Risk information. Due to the lack of certain channels for risk management and risk information communication, the communication of internal information between risks is very poor. It is often the risk discovered by the risk management department, but it cannot be timely fed back to the

investment department, resulting in risk information Delay in delivery.

2) Lack of a good risk assessment mechanism. At present, there is a lack of corporate risk assessment mechanisms in the market, and there is no quantitative risk assessment basis. Risk assessment is too subjective and is not conducive to continuous risk prevention and lasting risk tracking;

3) Lack of risk supervision and management. The supervision of risk management is conducive to continuous improvement and improvement of the current problems in risk management. However, due to the lack of a corresponding supervision system, there is no corresponding supervision department for risk management, and risk management personnel are only responsible for whether the final investment plan is Existing risks are subject to examination and approval, and there is no corresponding intervention in daily risk supervision, which makes it difficult to continuously discover problems and improve them.

The establishment of a scientific and standardized risk control management process is only the basis. Through the guidance of corporate culture, implement various risk control management systems, so that all employees can establish a sense of danger, so as to prevent risks before they occur, and do not let go of any currently predictable Risks are unpredictable risks at the same time, and a certain amount of leeway for operation can be reserved to maximize the company's investment and research team in a good condition and avoid the occurrence of risks and mistakes. On the one hand, we must recruit risk control personnel in a targeted manner, use our own resources to build a systematic training platform for corporate employees, and organize various types of trainings to help corporate employees gradually improve their professional and professional qualities. On the other hand, it is necessary to combine practical cases to strengthen the combination of risk control personnel's theory and practice, and at the same time to predict the future, make various risks as controllable as possible, and avoid more risk exposure. Once again, it is necessary to strengthen the rewards for the personnel who have contributed to risk management, and combine rewards and punishments to form an operable reward and punishment system.

3. Experiments

3.1. Research Object

There are many research applications on nanomaterials composite technology at home and abroad, but due to the different national conditions and needs of different countries, the key research directions also have different focuses. Based on this, the author uses CNKI, Baidu and other network platforms to find out by consulting relevant information. Related literature, and sort and sort the collected data. Statistics on the main application fields of domestic and foreign nanomaterial composite technology and the distribution of domestic and foreign companies are shown in Table 1 and Figure 1:

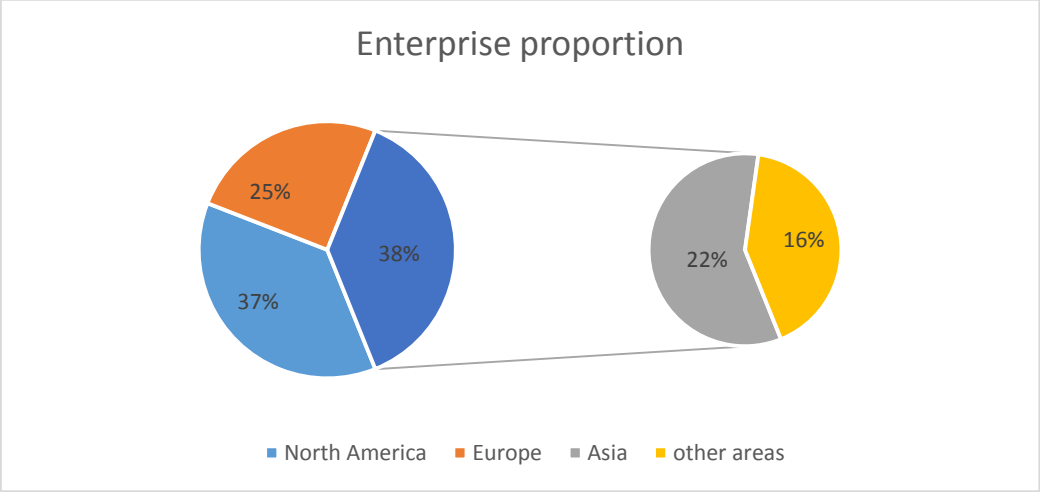

Figure 1. Proportion of global nanomaterial composite technology companies

Table 1. Main application areas of global nanomaterial composite technology

North America	Europe	Asia and others
Electronic and electrical	Health and personal care	Electronic and electrical
Health and personal care	Electronic and electrical	traffic
energy	traffic	package

3.2. Research Data Sources

The data in this article mainly comes from the Analysys Think Tank National Enterprise Information Publicity, the National Bureau of Statistics, the company's official website and related industry information statistics platforms.

3.3. Research Methods

After determining the key issues to be solved in the research, this paper establishes a correlation through data collection and the effective profitability of nanocomposite technology companies and the particle size of the products and nanomaterials produced by the companies.

In terms of literature analysis, this article collects literature on CNKI, Wanfang database, SSCI and other databases by using nanomaterials composite technology, investment risk, investment management, etc. as keywords, and obtains more than 20 articles for reference. reference. The author has thoroughly read and sorted out the collected literature, and fully understood the research results of related issues at home and abroad, and laid a certain theoretical foundation for the research of this article.

4. Discussion

4.1. There are Big Differences in the Application of Nanomaterials Composite Technology in Different Regions

According to the survey findings, developed countries such as North America and Europe are mainly used in automobiles, aerospace, transportation, and health products. In Asia and other

underdeveloped regions, they are mainly used in transportation, pollution control, and medical treatment. The details are shown in Figure 2:

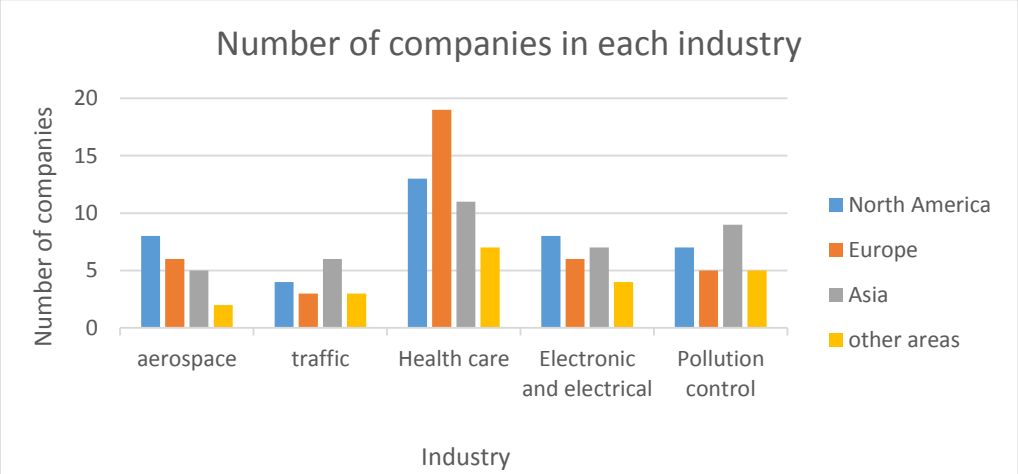

Figure 2. Distribution map of the number of nanomaterials composite technology companies

4.2. Effective Profitability of Nanomaterials Composite Technology is Related to the Research Direction of Nanomaterials

As shown in Figure 3, the current profitability of nano-material composite technology companies is not ideal. The number of profitable companies is about half of the total number. However, in the health care industry, nano-material composite technology companies can basically achieve profitability. Due to the improvement of people's health awareness, on the other hand, because the medical and health industry is a high-tech enterprise, it can basically achieve profitability if it can reach the entry threshold. The most important thing for nano-material composite technology to reduce investment risk is to attach importance to research and innovation, cultivate innovative talents, and achieve that others do not have what we have, and we are superior. Enterprises are directly facing the economy and the market, and their scientific research is mainly applied research and development, that is, technological innovation, which makes enterprises the main body of application research and development. However, for enterprises, knowledge innovation is the basis of enterprise strength, because knowledge innovation is the foundation of technological innovation. The subjects of knowledge innovation are universities and research institutes, and basic research is the source of knowledge innovation. Although the results of basic research cannot be directly transformed into market economic benefits, they can restrict the high-tech level that produces huge benefits. If an enterprise wants to improve efficiency and reduce risks in the market, innovation is an important means.

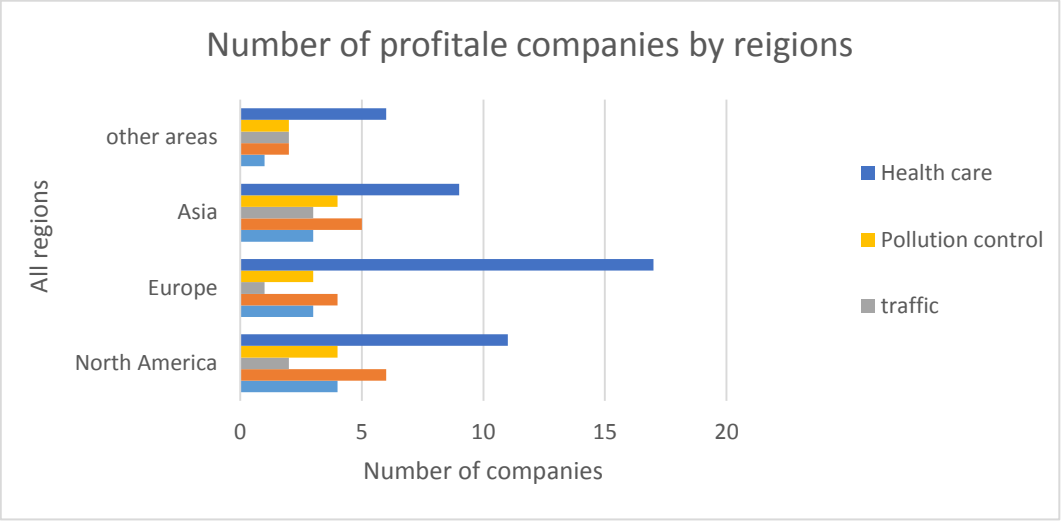

Figure 3. The profit volume and industry distribution of nanomaterials composite technology companies

4.3. Profitability of Nanomaterials Composite Technology Companies is Related to the Particle Size of Nanomaterials

As shown in Figure 4, we can clearly see that as the particle size of nano-material composite technology gradually becomes smaller, the profitability of the company is gradually increasing. When the particle size of nano-material composite technology reaches 5nm, the profitability effect reaches highest.

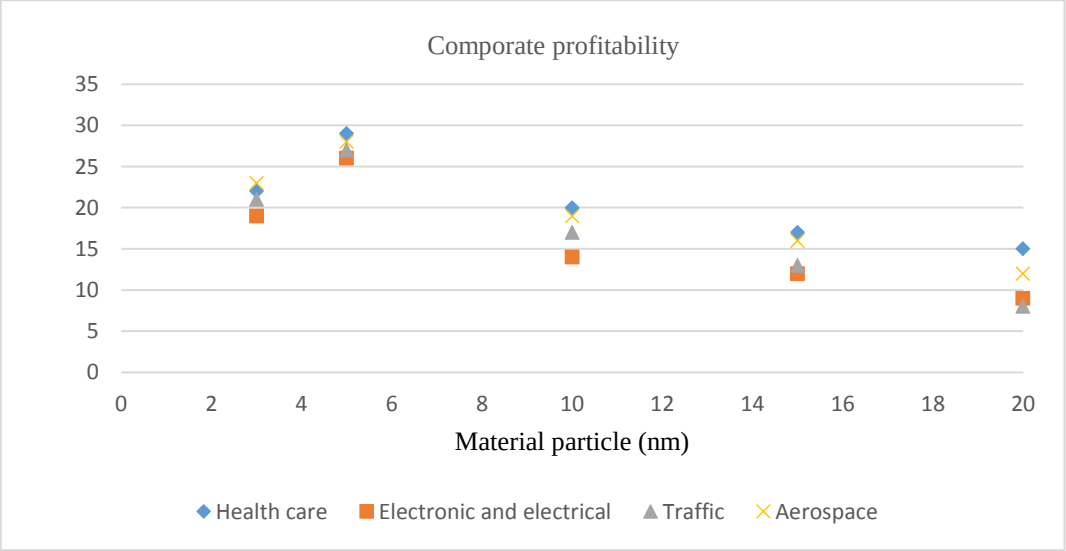

Figure 4. Nanometer particle size and profitability of nanocomposite companies

The ultimate goal of investment capital is to make a profit, and the process is a process of continuously improving the risk control system and controlling risk factors. To choose a nanomaterial composite technology enterprise to invest, we must first fully understand and

understand the development status and development plan of the nanomaterial composite technology industry. Secondly, venture capital investment is a continuous process that requires multi-stage uninterrupted investment and support. The risk factors faced by each stage are constantly changing, which requires us to take different control measures according to different factors.

On the one hand, it is necessary to formulate and improve related management mechanisms to ensure the effectiveness and timeliness of corporate financial management while ensuring information security. In the process of corporate financial risk management, it is necessary to mine big data, manage all levels from model establishment to actual application; reasonably divide responsibilities according to the effective period of data information, identify management personnel, and pass encryption, access restrictions and Technical means such as monitoring shall establish and improve the safety management mechanism.

On the other hand, it is necessary to reasonably plan the objectives and desired goals of risk management at the operational level according to market rules and the operation and management methods and conditions of the enterprise, and formulate corresponding operational crisis management implementation rules in combination with the objectives of operational risks, especially The construction of crisis assessment system and the planning of crisis management methods.

5. Conclusion

Due to its characteristics, nanocomposites have more advantages than other materials, and are more widely used. Also, because of the cutting-edge nature of nanomaterials composite technology, the entry barrier is relatively high, and the competition is relatively small, and the investment risk is not high, but Risks are everywhere in the business process of enterprises. As the main body of investment, project investment is subject to the constraints and influences of the project investment itself and various external factors. Project investment, project operation, and project completion are flooded with various stages kind of risk.

In order to ensure the smooth development of all aspects of project investment, the project investment can eventually reach the investment goal smoothly. It is necessary to make a variety of possible predictions for the risks that may be caused by the source of risk, and to measure the probability of each occurrence. On this basis, to find the corresponding solution, not only rely on the judgment of the individual investment, but to improve the risk control framework System to control risks, strengthen scientific probability analysis, and reduce human subjective judgments. The risk loss can be refined by establishing scientific and quantitative indicators. During the operation of the market, the original risk source's risk control level should be optimized and processed in real time to strengthen the evaluation and control management in the event.

Therefore, how to make investment decisions more scientific and how to effectively control and identify the risks in investment is of vital importance. On the one hand, good projects must be strongly supported, and on the other hand, corporate funds must be used and used well. Benefit, which is of great significance to the development of nano-material composite technology projects, investment institutions and industry.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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