

# *Research on Risk Management and Countermeasures of Inclusive Finance ——From the Perspective of Comprehensive Risk Management of Credit Insurance*

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**Abstract:** Inclusive Finance of Policy-based Export Credit Insurance Institution, has plays an important role in supporting small and micro enterprises, while the risk control of Inclusive Finance is particularly important. Different from general commercial financial institutions, the focus of Inclusive Finance risk management of policy-based financial institutions should be on maximizing social benefits rather than maximizing economic benefits of traditional risk management theories. This also requires repositioning the target set of Inclusive Finance risk management system of Policy-based Export Credit Insurance Institution. Therefore, starting from the concept of Comprehensive Risk Management, this paper analyzed the characteristics and difficulties of Inclusive Finance risk management of Policy-based Export Credit Insurance Institution, constructed the Comprehensive Credit Risk Management System and framework of Inclusive Finance, and put forward preliminary suggestions so as to provide better Inclusive Finance services and better management of risk.

## **1. Introduction**

In recent years, the research on the theories and practice of risk management has entered the era of Comprehensive Risk Management. Many kinds of enterprises and financial institutions have implemented the concept of comprehensive management into their own risk management practice and achieved fruitful results. However, the Comprehensive Risk Management research on Inclusive Finance of Policy-based Export Credit Insurance Institution is still in its infancy.

## **2. The Concept of Comprehensive Risk Management**

In the traditional concept, risk means the uncertainty of cost and benefit and the possibility of loss. This concept includes two extended meanings: first, risk is the source of loss to natural person or social subject; second, through effective control of risk, especially the balance between risk and income, loss can be reduced and even corresponding income can be obtained. Therefore, it is necessary for all organizations to maintain long-term sustainable development to achieve effective risk management.

The concept of risk awareness and risk management has sprouted for thousands of years, but it began to be a separate discipline in the field of management science since the 1950s. After more than half a century's development, the research and practice of risk management has developed from insurance risk management based on pure risk theory to overall risk management based on total risk theory, and has been widely concerned and participated by governments, theoretical circles and business circles all over the world. In 2004, The Committee of Sponsoring Organizations of the Treadway Commission (COSO) issued the enterprise risk management - integrated framework, formally proposed the concept of Comprehensive Risk Management and was widely recognized in the industry. In this system, the framework of enterprise Comprehensive Risk Management is formulated into three dimensions: target system, management elements and main unit, and the whole process of enterprise risk management is embedded in the thinking of process control. Since then, risk management has entered the era of Comprehensive Risk Management, paying more attention to the combination of risk control elements such as risk identification, risk assessment and risk aversion with internal control means such as process design, function setting and information system construction, and has achieved rich research and practice results.

Specifically, Comprehensive Risk Management has three dimensions: the first is the goal set of risk management, including the strategic objectives, business objectives, reporting objectives and compliance objectives; the second is the element set of risk management, including internal environment, goal setting, event identification, risk assessment, risk response, control activities, information and communication and control supervision; the third is risk management.

In short, the basic idea of Comprehensive Risk Management can be summarized as: why and what to carry out risk management- what kind of means should be adopted for risk management - who will carry out risk management. It should be said that the emergence of the concept of Comprehensive Risk Management has largely changed the pure technical school thinking of just managing for management in the past risk management research and practice, and guided enterprises to move towards a more pragmatic, more goal-oriented, more emphasis on the full participation and the main responsibility of the whole process of risk control. In recent years, it has provided an important idea on risk management for enterprise risk management, especially financial institution.

### **3. Analysis on the Inclusive Finance Risk Management Characteristics of Policy-based Export Credit Insurance Institution**

As the power source and resource center of modern economic system, the risk management of financial institutions has always been the focus of research in the industry. On the one hand, the risk management ability of financial institutions directly determines the social financing cost and economic development level, on the other hand, it is also because the risk management of financial institutions plays a crucial role in the smooth operation of social and economic system. However, as an extremely special financial unit, the policy-based export credit insurance institution has great differences from other financial institutions in the Inclusive Finance risk management, mainly in the following three aspects:

#### **3.1 The Objects of Inclusive Finance Risk Management is Different**

According to the different sources of risk, Basel Accord divided the risks faced by banks and other financial institutions into three categories: Credit Risk, Operational Risk and Market Risk. Among them, credit risk, that is, the risk of default of counterparties, is the main risk faced by financial institutions, which has a decisive impact on the survival and development of financial institutions. However, the concept of credit risk faced by financial institutions is more special,

which includes not only the credit risk of the counterparties, but also the repayment risk of the insured's counterparties under the credit subject. In the general business process, the focus of credit risk management is even the latter rather than the former.

At the same time, affected by the policy and export-oriented factors, compared with the commercial operation of general financial institutions, the external credit risk factors of Policy-based Export Credit Institution are greatly increased. In addition to the national foreign policy, foreign trade, industry, finance and other policy factors, the international political and economic change factors, country risk change factors, international industry risk change factors, international financial system risk change factors are all important factors affecting Inclusive Finance services of Policy-based Export Credit Institution. At the same time, international credit rating agencies, as an important source of information for financial institutions, have been widely questioned in recent years due to a series of events confirming that their rating work is more commercial activities, and the rating results have been questioned, so it is difficult to be the main reference factor for companies to make credit decisions. Therefore, the research on Inclusive Finance risk management of Policy-based Export Credit Insurance Institution needs to fully estimate the correlation of various risk factors, and establish a new measurement model to evaluate from the perspective of complex system.

### **3.2 The Nature of Inclusive Finance Risk Management Subject is Inconsistent**

From a dialectical point of view, Policy-based Export Credit Insurance Institution can be seen as a unity of contradictions in three dimensions. The first is the unity of policy and finance. It has the general financial functions and characteristics of risk transfer and credit intermediary, and at the same time, it does not fully open up and implement professional supervision, which is a powerful financial tool to reflect the will of the state and safeguard national interests. The second is market orientation. On the one hand, it takes the market and customer orientation as the operation idea, adopts the market-oriented means to develop the market and maintain the customers, and maintains the normal operation by collecting the premium or guarantee consulting fee. On the other hand, it insists on not competing with commercial organizations for profit and not for the purpose of profit. On the premise of sustainable operation, the degree of policy function is regarded as the business performance. The third is the contradiction and unity of monopoly and competitiveness. Because export credit insurance is highly professional and policy-based, the government generally provides Inclusive Finance services by setting up or appointing financial institutions, but at the same time, it will introduce some external competitors to open up the market for some businesses with high commercialization and low risk level. This will enable policy institutions to concentrate their efforts and resources on Inclusive Finance key support for foreign economic and trade activities with high risk level, low development level and significant impact on national social economy. Therefore, for Policy-based Export Credit Insurance Institution, the control of Inclusive Finance credit risk is not only the need of their smooth operation and sustainable development, but also the need to maintain and develop the overall interests of the country.

### **3.3 The Objectives of Inclusive Finance Risk Management is Inconsistent**

According to knight, profit is the reward for entrepreneurs to reduce uncertainty. The current research on risk management has gradually realized the research from pure technical level of risk managing for risk management to understanding and studying risk management activities from the perspective of value realization of risk-return, regarding risk management as a means of value creation and taking maximization of shareholder value as the ultimate goal of risk management. However, it is obviously inappropriate to use this research perspective to study the risk management

of non-profit organizations, especially Policy-based Export Credit Insurance Institution.

In fact, the only ultimate shareholder of Policy-based Export Credit Insurance Institution is the central government. Most of the actual shareholders are the central government departments or the agent investors designated by the central government. Their mission is to maximize the national interests by playing the policy role to the greatest extent. The government has very low requirements on the profitability or return on capital indicators of export credit agencies, and more of them require capital preservation operation. Therefore, there is no endogenous motivation to maximize shareholders' equity or profit in the Inclusive Finance services of Policy-based Export Credit Insurance Institution. Therefore, the research on the Inclusive Finance risk management must start with the clear business objectives, instead of simply applying the existing risk management theories and methods of financial institutions.

#### **4. Inclusive Finance Comprehensive Credit Risk Management System of Policy-based Export Credit Insurance Institution**

The formulation and changes of a country's foreign economic and trade policies are made based on national interests. As an important policy strategic grasp of foreign economic and trade policies, Inclusive Finance of Policy-based Export Credit Insurance Institution can play a unique role in promoting the development of foreign trade and economic cooperation in addition to the traditional means such as export tax rebate of small and micro export enterprises. Therefore, the research on the Inclusive Finance risk management of Policy-based Export Credit Insurance Institution should start from the perspective of national interests, analyze the origin of Policy-based Export Credit Insurance Institution from the political interests, economic interests and security interests of a country, and from the perspective of complex systems science, analyze the Inclusive Finance credit risk factors faced by Policy-based Export Credit Insurance Institution. Finally, on the basis of the model, the paper constructs the Inclusive Finance Credit Risk Management System of Policy-based Export Credit Insurance Institution with the main context of pre assessment, in-process control and post loss reduction, so as to effectively establish the risk management mechanism, and contribute to the stable and sustainable operation of Inclusive Finance and the promotion of foreign trade and economic development.

Specifically, a Comprehensive Credit Risk Management system of Inclusive Finance should at least include the following parts:

##### **4.1 Objectives of Inclusive Finance Credit Risk Management and Control System**

The operational objectives of Inclusive Finance Credit Risk Management and Control System should be based on the overall operational objectives of institutions or organizations, and serve the overall objectives of Inclusive Finance, while Policy-based Export Credit Insurance Institution is no exception. There is no doubt that the operational goal of Policy-based Export Credit Institutions is not to maximize their own economic interests, but to maximize the social interests through Inclusive Finance, that is, to fully optimize the allocation of credit resources within the scope of their capabilities, so as to maximize the benefits of small and micro enterprises in their own countries or regions.

##### **4.2 Elements of Inclusive Finance Credit Risk Management and Control System**

For export credit insurance institutions, the elements of its Inclusive Finance Credit Risk Management and Control System should include two aspects: subject and object. The main body should be the decision-makers at all levels, the formulation and implementation departments of risk

control policies, and relevant participants. The client refers to the credit risk level that can be classified, measured, evaluated and adjusted, including the credit risk of counterparties (policyholders) and the credit risk of the subject matter (receivables under foreign buyers) of Inclusive Finance.

#### **4.3 Index and Threshold of Inclusive Finance Credit Risk Management and Control System**

In order to achieve effective Inclusive Finance credit risk control, we must be able to identify the index groups that can effectively determine or affect the risk level under the overall framework of Inclusive Finance credit risk management, and set effective threshold range for each index through observation and measurement.

#### **4.4 Operation Tools for Inclusive Finance Credit Risk Management and Control System**

Credit risk control tools of financial institutions are generally credit policies and credit decisions in the process of specific implementation. For Policy-based Export Credit Institution, its unique control tool is the Inclusive Finance credit limit under the underwriting policy, which is liable for each underwriting subject (overseas buyer) of Inclusive Finance under certain underwriting conditions.

#### **4.5 Operation Mechanism of Inclusive Finance Credit Risk Management and Control System**

The operation mechanism is how the managers make the operation plan of the risk management system, set the Inclusive Finance risk control index and its threshold, and through the effective authorization, organization, leadership and control of the participants in the Inclusive Finance risk management system in the institution, and effectively monitor, early warn and control the credit risk exposure level in the whole process of Inclusive Finance operation. The core of financial credit risk control system and the determinants of risk control effect.

Therefore, the comprehensive credit risk control of Policy-based Export Credit Insurance Institution must start from the mission, objectives and articles of association of the institution itself, take the maximization of social benefits of Inclusive Finance as the starting point and ultimate goal, fully evaluate the Inclusive Finance operation and business process, and effectively identify the Inclusive Finance risk indicators. Only by setting the threshold of relevant indicators and early warning mechanism, and establishing the relevant Inclusive Finance control system can we effectively achieve this goal.

### **5. Framework Design of Policy-based Export Credit Insurance Institution Inclusive Finance Credit Risk Management**

According to the above analysis, from the perspective of Comprehensive Risk Management, the design of the credit risk management framework of the Policy-based Export Credit Insurance Institution Inclusive Finance can be carried out from the business objectives and purposes, and can be carried out in five dimensions: determining the target, defining the object, measuring the risk, determining the risk and organizing and implement.

#### **5.1 Target Determination**

Under the framework of Comprehensive Risk Management, the target system of Inclusive Finance risk management includes strategic objectives, operational objectives, reporting objectives

and compliance objectives. Strategic objectives and operational objectives are the cornerstone, reporting objectives are means and compliance objectives are safeguards. The overall objective of Inclusive Finance credit risk management can be initially defined as ‘Under the premise of ensuring the maximum export scale of supporting goods, technology and services, etc., the Inclusive Finance risk management indicators in each reporting period should be limited within certain operational constraints (compensation ratio, profit rate and solvency). Under this general objective, detailed risk management objectives are set according to the three dimensions of insurance type, country and insurance liability maturity. As shown in Figure 1.

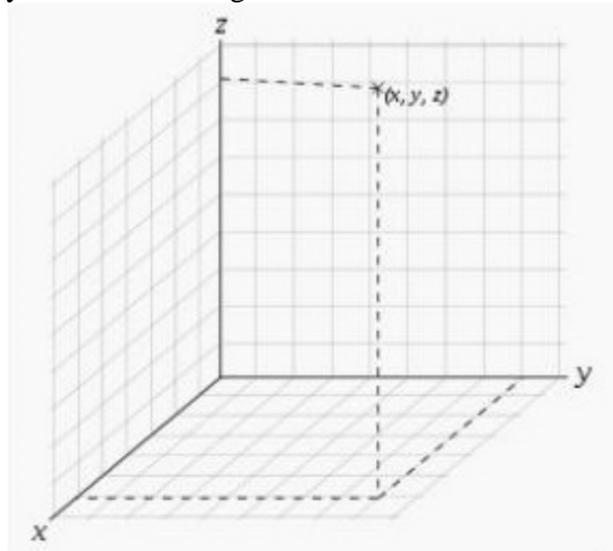


Figure. 1 Schematic Diagram of Inclusive Finance Credit Risk Exposure

In the figure, X-axis represents insurance type, Y-axis represents country, and Z-axis represents the due date of Inclusive Finance insurance liability. The point (x, y, z) represents the theoretical liability balance (or risk exposure) of Policy-based Export Credit Insurance Institution in Y country under time Z. P (x, y, z) represents the probability of loss of Policy-based Export Credit Insurance Institution X Inclusive Finance insurance in country Y under time Z. If the Policy-based Export Credit Insurance Institution has M Inclusive Finance insurance types and N underwriting countries,

then the total business risk exposure can be expressed  $\sum_{x,y=1}^{m,n} r_z$ , and the expected loss amount can be

expressed as  $P \cdot \sum_{x,y=1}^{m,n} r_z$ . The objective of Policy-based Export Credit Insurance Inclusive Finance

credit risk management is to ensure that the risk exposure level and to ensure that the risk exposure level and expected loss scale do not exceed the regulatory requirements through the real-time monitoring of the risk exposure value of Inclusive Finance underwriting business, and by adjusting the Inclusive Finance underwriting policy and timely increasing or reducing the scale of liability limit.

## 5.2 Define the Object

Clearing object in the Inclusive Finance credit risk management refers to the process of identifying the Inclusive Finance risk factors by means of perception, judgment and classification, and preliminarily determining the scope of the Inclusive Finance credit risk that may bring losses by

setting specific risk judgment indicators.

Different from the general credit risk management, the difficulty of the Policy-based Export Credit Insurance Institution Inclusive Finance credit risk management lies in the scarcity of financial data related to the Inclusive Finance risk. Except for the medium and long-term, guarantee business and some trade insurance buyers, other financial indicators under the Inclusive Finance business are generally unavailable. Therefore, the traditional methods such as Z-value model and Bathory model, which are highly dependent on the analysis of financial indicators, cannot be strictly applied to the practice of Inclusive Finance credit risk management of Policy-based Export Credit Insurance Institution. The selection and evaluation of risk indicators must start from the stage of risk identification.

Specifically, the Policy-based Export Credit Insurance Institution can adopt the method of 'Backward Deduction of Loss Cause' and sort out the causes of possible loss Inclusive Finance cases in the history, and divide the sources of Inclusive Finance credit risk into three categories: Policyholder Risk, Subject Risk and Macro Risk.

The above-mentioned risk factors are interrelated and interact with each other. In specific cases, many risk factors present at the same time. Therefore, in the stage of Inclusive Finance risk identification, Policy-based Export Credit Insurance Institution should carry out correlation analysis based on historical case data, classify and integrate relevant detailed risk factors, so as to ensure that the Inclusive Finance risk measurement model can have a high degree of realistic fit, and provide scientific reference for it.

### **5.3 Risk Measurement**

At present, the main research methods of credit risk measurement in the world include Statistical Model, Value-based Credit Risk Model, Neural Network and Support Vector Machine Model. Among them, the Survival Analysis method in statistical model is the most widely used method, which can better overcome the defects of traditional cross-section data. Existing studies have proved that survival analysis method can predict the probability of enterprise bankruptcy more effectively than other statistical methods, and can effectively add industry factors into consideration factors.

Under this method, Policy-based Export Credit Insurance Institution can use copula function and Survival Analysis to calculate the overall Inclusive Finance risk rate of various types of underwriting business through the integration of historical underwriting, possible loss and claim settlement information of Inclusive Finance, and obtain the influence value of each risk factor on the overall Inclusive Finance risk rate, that is, the credit risk which is used to monitor the credit risk level of Inclusive Finance business.

### **5.4 Risk Determination**

To determine the risk means to monitor and manage the real time early warning system of credit risk through the construction of credit risk early warning index system. The research and practice of credit risk early warning management is basically concentrated in the banking industry, and there is almost no research on the construction of credit risk early warning system in other fields, especially in the field of export credit insurance. In view of the reality of Policy-based Export Credit Insurance Institution, we can consider establishing the initial early warning index system of Inclusive Finance from internal and external perspectives based on the identification and measurement of Inclusive Finance credit risk. The internal risk early warning index system of Inclusive Finance includes the insurer and the insured, respectively considering the solvency, business scale growth, financial structure, internal control mechanism perfection and the insured industry attributes, product

attributes, market attributes and business stability attributes. The indicators of Inclusive Finance external risk early warning system include macroeconomic environment, financial environment, balance of payments, stability of financial institutions, industry stability, political and social stability. On this basis, the Inclusive Finance risk early warning indicators are screened and determined by cluster analysis, and is attempted to solve the problem of how to determine based on rough set and classifier integration

## **5.5 Organizational Implementation**

Organizational implementation is the process of establishing a systematic internal control system and building a Comprehensive Credit Risk Control System based on the above risk identification, measurement and early warning. According to COSO Comprehensive Risk Management framework, the specific implementation departments of credit risk management and control in enterprises include four levels: enterprise level, division level, business unit and subsidiary company. Considering the actual situation of Policy-based Export Credit Insurance Institution, we can consider adopting three-level-pyramid mode to carry out the Inclusive Finance Comprehensive Credit Risk Management: the first level is the board of directors and management; the second level is the management and approval department of Inclusive Finance; the third level is the Inclusive Finance business institutions.

In addition, data collection, model construction, system construction and process design are a more comprehensive and complex engineering system, in which information management department, claim department and other related institutions have important positioning and play an indispensable role. Through the above structure, we can make clear the positioning and role of all levels and institutions in the Inclusive Finance Comprehensive Credit Risk Management, and try to ensure that the structure of the system is simple and efficient, and provide support for the healthy operation of Inclusive Finance business.

## **6. Suggestions on Inclusive Finance Risk Management of Policy-based Export Credit Insurance**

### **6.1 Attach Great Importance to the Credit Risk Management of Inclusive Finance**

Policy-based Export Credit Insurance Institution shoulder the national mission, but also accept external supervision. How to control the risk and maximize the support to the development of national foreign trade and economic cooperation under the constraints of effective resources should be the starting point and main research ideas of Inclusive Finance credit risk management. Therefore, it is necessary to pay more attention to the credit risk management of Inclusive Finance, so as to increase the investment of resources and construct the risk control mechanism of the whole process of Inclusive Finance.

### **6.2 Fully Understand the Characteristics of the Inclusive Finance Credit Risk Management**

As a policy-based financial institution, the goal of credit risk management of Policy-based Export Credit Insurance Institution is completely different from the concept of valuing first and maximizing commercial interests of ordinary commercial financial institutions. Meanwhile, the main objects of Inclusive Finance risk management are also significantly different from other financial institutions. Therefore, in order to manage the Inclusive Finance credit risk of Policy-based Export Credit Insurance Institution, we should start from the reality of Inclusive Finance business, review the existing theoretical models and practical operation results of Inclusive

Finance credit risk management, select the content that is more suitable for Policy-based Export Credit Insurance Institution, and combine with the actual situation to develop and discard, so as to form a Comprehensive Credit Risk Management System of Inclusive Finance.

### 6.3 Firmly Combing the Concept of Inclusive Finance Comprehensive Credit Risk Management

Comprehensive Risk Management is not only a framework, but also an idea that can take root. In the current stage of continuous development of national foreign trade and expansion of Inclusive Finance business, especially under the background of insufficient global economic prosperity and high incidence of various international risk factors after the epidemic, it is more necessary for Policy-based Export Credit Insurance Institution as a whole to attach importance to and promote the credit risk management of Inclusive Finance. In particular, the leading role of decision makers in credit risk management and the information superiority of business institutions in risk management should be brought into play by being built up with the concerted efforts of the whole staff and the whole participation, so as to build an efficient credit risk management system covering the whole process of Inclusive Finance business.

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