Research on Internal Control Demand, Supply and Supervision of Chinese Listed Companies based on Big Data Analysis

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Abstract. The demander of enterprise internal contain information comes from many aspects. Different information demand subjects have different motives. This article first conducts a theoretical and systematic analysis of the demand drivers for internal contain based on big data analysis, and then conducts a statistical analysis of the internal contain quality and information disclosure of listed companies in my country in 2018 based on big data. Finally, combined with big data, put forward targeted regulatory recommendations. As for some listed companies in our country, the requirements of internal control level are not high and the accuracy of control related information exists, we need to make outstanding contributions to this research.

Keywords: Internal Contain Information, Internal Contain Quality, Information Disclosure, Government Regulation, Big Data

1. Research Background
Internal contain, as a key link of corporate governance and an important measure of operation and management, is conducive to improve the quality of financial information and business efficiency and benefits. As important non-financial information, internal contain information has obvious signal transmission effect, so the quality of its disclosure, has been the focus of investors and regulatory authorities. According to the requirements of Internal contain Guidelines for Listed Companies of Shanghai Stock Exchange and Internal contain Guidelines for Listed Companies of Shenzhen Stock Exchange, listed companies shall fully disclose the establishment and improvement of internal contain in the annual report since 2007. Although China has promulgated a series of norms and systems in the construction of internal contain system and information disclosure, there is still a big gap between China and western developed countries such as Britain and the United States. In view of this, we will first systematically analyze the demand motives of internal contain in theory and then have a statistic analysis on the internal contain quality and information disclosure of the listed companies in China in 2018. Finally, on the low degree of control of Listed Companies in China and some technical problems, this paper will put forward targeted regulatory recommendations. Using these suggestions, this paper intends to make a useful contribution to the research in this field.
2. Demand Motivation Analysis of Internal contain

2.1. Demand Motivation of Enterprise Owners
Principal-agent relation refers to the relation formed when one or more people (i.e. principals) hire another person or some people (i.e. agents) to perform certain services on their behalf and thereby entrust certain decision-making rights to trustees. Information disclosure is one effective way to eliminate asymmetric information and reduce agency cost. The principal has a strong motivation to require the enterprise management authorities to provide enterprise operation and management information including financial information, internal contain information, etc., so as to minimize the information asymmetry with the agent and reduce their own supervision and agency costs. In terms of internal contain information, the enterprise management authority is directly responsible for the design and operation of the internal contain system, who owns the relatively comprehensive internal contain information and the absolute information advantage; however, limited by their own ability, time and other factors, enterprise owners cannot understand all aspects of enterprise internal contain and are at an absolute information disadvantage. Due to the opportunistic tendency of the management, the agent may damage the interests of the principal to some extent in order to maximize his own interests. In order to restrain the opportunistic behavior of management authorities, it is necessary to introduce an effective supervision and restraint mechanism to compel management authorities to disclose comprehensive and true internal contain information so as to measure the performance of entrusted economic responsibility of management authorities. The role of internal contain information disclosure is to restrain the opportunistic behavior of management authorities, test the efficiency and effect of the implementation of entrusted economic responsibility, and ensure the integrity and stability of the performance of entrusted economic responsibility.

2.2. Demand Motivation of Potential Investors
Capital market is an information market in essence, and investors widely rely on the information disclosed by enterprises as the bone for decision-making. To some extent, the failure of internal contain is riskier than the decline in business performance, so investors pay special attention to the quality of internal contain and informational disclosure. However, investors are in a weak position in obtaining information, which leads to different degrees of information asymmetry between investors and enterprises. Investors take additional information risks due to "adverse selection" and "moral hazard". Internal contain information disclosure is an important signal display mechanism, which can increase the transparency of corporate governance information, make investors understand whether enterprise management contain is effective to a certain extent, and make up the weak position of investors' information. Specifically, the quality of internal contain information disclosure has a direct impact on the scientific decision-making of investors and the size of the risk, and then further affects investors' confidence in the capital market. High-quality internal contain information disclosure can effectively alleviate the information conflict between investors and enterprises, guide investors to make reasonable decisions, which may promote the effective operation of the capital market. On the contrary, the low quality of internal contain information disclosure will not be conducive to investors to make scientific judgment and will have an impact on the efficiency of the capital market.

2.3. Demand Motivation of Enterprise Management Authorities
The demand motivation of enterprise management authorities mainly manifests to disclose internal contain information voluntarily. The establishment and maintenance of effective internal contain system is the responsibility of the management authorities and internal contain information disclosure is based on the evaluation of internal contain of the board of directors and management authorities. As the enterprise management authorities that know the most about internal contain, they will send their real information to the outside through some signals, and the market will react positively to this. Internal contain information disclosure is a way for the management authorities to release the entrusted economic responsibility, so as to prove their diligence and show their efforts and
effectiveness. When the company's internal contain system is reasonably designed and effectively operated, the management authorities through the disclosure of the real internal contain status, not only show their own performance, but also are conducive to the establishment of their good image in the capital market, which will enhance investors' confidence in the enterprise. However, since the management authorities have the nature of a rational person, the level of internal contain information disclosure depends on the management's own will. In addition, the demand motivation of enterprise management is also reflected in the need to strengthen enterprise management. Through the self-evaluation of the management authorities to internal contain, they can clearly define their responsibilities and find out the enterprise internal contain defects in time, then further put forward and implement the improvement the plan accordingly, in order to ensure the effective operation of internal contain.

2.4. Demand Motivation of Government Regulators

The demand motivation of government regulatory departments is mainly manifested as the "mandatory" disclosure of internal contain information. Internal contain information is disclosed publicly in the capital market and has the property of public goods. The so-called public goods refer to non-exclusive and non-competitive goods. Internal contain information disclosure has the non-exclusive and non-competitive characteristics, such as when investors make decisions based on internal contain information, they can’t exclude others to use the information. Since the use of this information by an additional investor will not increase the costs and benefits of information disclosure, there doesn’t exist competitive issue. However, due to the public product attribute of internal contain information, the production of internal contain information is insufficient, and there is information asymmetry between information demanders and information suppliers, which may lead to unreasonable resource allocation, reduce the efficiency of capital market, increase the cost of market operation, and lead to the failure of market mechanism. At this time, there must exist a third party who could represent the public interests to compulsively require the disclosure of enterprise internal contain information. All in all, the proper regulation of the government authorities to the capital market, namely the mandatory disclosure of internal contain mechanism, can put the internal contain of the enterprise under public supervision, which will to a certain extent, ease the contradiction between supply and demand of internal contain information, reduce the asymmetry of market information, form a good order of information demand and supply, leading to promote social fairness and efficiency.

3. Internal contain Quality and Internal contain Information Supply of Listed Companies

Demand restricts supply while supply reacts with demand, which means internal contain information disclosure drive to a large extent depends on the needs of information users. However, under the interaction between mandatory disclosure regulations and voluntary disclosure motivation, how the quality of internal contain and internal contain information supply of China's listed companies act still needs us to conduct further discussion by actual date. Considering the availability of data, the author chooses the internal contain information disclosure index disclosed by "Dibo • Internal contain Index of Chinese Listed Companies" (referred to as "Dibo Index") to study the internal contain information disclosure status of listed companies. The internal contain information evaluation index refers to the five objectives of internal contain as a clue, which means the strategic level, business level, reporting reliability, legal compliance, asset safety. The five sub-indicators and one internal contain index consist of the internal contain index. What the internal contain index really is and its disclosure status quo can be showed as table 1:
Table 1. Internal contain Information Disclosure Status Quo.

| Project                  | N   | Mean       | Std. Dev. | Min | Max  |
|--------------------------|-----|------------|-----------|-----|------|
| strategic level index    | 3456| 454.6075   | 217.8785  | 0   | 1000 |
| business level index     | 3456| 447.9931   | 154.7707  | 0.0501| 1000 |
| reporting reliability index | 3456| 775.2315   | 243.4477  | 0   | 1000 |
| legal compliance index   | 3456| 871.4482   | 269.1175  | 0   | 1000 |
| asset safety index       | 3456| 481.4825   | 152.096   | 0   | 1000 |
| internal contain index   | 3456| 593.6482   | 190.4519  | 0   | 893.23|

On the whole, the internal contain quality of listed companies is not high. From the perspective of internal contain index, the average value is 593.6482, accounting for only 59.36% of the total number of internal contain indicator (1000), which has not reached the passing level, indicating that the overall level of internal contain of listed companies is relatively low. Moreover, the standard deviation of the internal contain index is 190.4519, which indicates that the variation range of the internal contain index between different companies is relatively large. It may reflect the large difference of the internal contain quality of listed companies.

In terms of specific indicators, the average values of the three sub-indexes -- strategic level index, business level index and asset safety index are all lower than 500, indicating that these indexes have not reached half of the level of the ideal state (1000). So, there is still plenty of room for improvement. Moreover, the average values of reporting reliability index and legal compliance index are 775.23 and 871.45 respectively, which indicates that these two indexes are generally valued by listed companies. However, the standard deviation of these two indexes is still large, indicating that these two indexes show great differences in different companies[1-2].

4. Improve the Internal contain Quality of Listed Companies Regulatory Strategy

To sum up, the overall level of internal contain quality of listed companies is low, and the supply of internal contain information is far less than the information demand. Government departments have the responsibility of supervision and coordination, and strengthening supervision and coordination are an important guarantee to improve the quality of internal contain and promote the effective implementation of internal contain information disclosure system. The author thinks that government departments should strengthen supervision and standardize internal contain information disclosure behavior, so as to coordinate the contradiction between supply and demand of internal contain information. To be specific, we should start from the following aspects:

4.1. Unifying the Standards and Requirements for Internal contain Information Disclosure

The supervisory departments shall formulate an authoritative internal contain self-evaluation report framework to standardize its content and format and improve the operability of internal contain self-evaluation. Formulating unified enterprise internal contain self-assessment report content and format can reduce the enterprise cost of self-evaluation and boost the enthusiasm of the self-assessment management authorities. And moreover, since the disclosure of internal contain information has one consistent basis and the information content is the same, which can be convenient for investors to compare between companies and further strengthen the scientificity and reasonability of their investment decisions.

4.2. Internal contain Defects Need to Be Disclosed in Detail

The supervision departments shall regulate the disclosure of defects and require the management of
the listed companies to disclose the internal contain defects in detail. According to the severity, the internal contain defects shall be divided into three types: general defects, important defects and major defects. In addition, the disclosure of defects must be accompanied by further explanation of the company's proposed improvement measures\[^{3-4}\].

4.3. Improve the Penalty Mechanism and Increase the Penalty Cost

At present, there is no accountability mechanism for internal contain evaluation in China, not to mention to regulate it by law. When listed companies violate the internal contain information disclosure regulations, there lacks specific penalties, which is one of the important reasons for the low level of internal contain information disclosure. Therefore, the supervision departments should strengthen the supervision of internal contain information disclosure, establish and improve the corresponding punishment mechanism, which refers to severely investigating the responsibility of relevant personnel of companies that violate the internal contain information disclosure regulations in order to increase the penalty cost of listed companies\[^{5-6}\].

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