Financial Accounting Management Based on Computer Network Environment

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Abstract

With the application of computer technology in the financial management of enterprises, the environment and means of its management have changed greatly, and many problems have been effectively solved, thus enhancing the competitiveness of the enterprises.

Keywords

Financial management, Computer application, System optimization, Database management

Introduction

Artificial intelligence is mathematical logic, fuzzy mathematics, computer science, cybernetics, information theory, many disciplines of management science, physiology, psychology, linguistics and philosophy of mutual penetration of a new discipline comprehensive and developed. Enterprise has accumulated a lot of financial data in the process of information development, but the commercial value of this financial data has not been fully excavated and utilized. The current situation is the massive financial data information about the potential depth is not enough in-depth traditional diagnostic methods and using [1]. Data mining is an efficient tool, its advantage is the ability to quickly from many missing, noisy, fuzzy and random data in the capture of valuable but not known information. On this basis, the unique business rules behind these data, and these rules are summarized into a model. Modern enterprise financing theory originated from the famous MM theory. This theory started the modern enterprise financing efficiency theory of the first of its kind [2].

A profound discussion is put forward in the article, which has attracted the attention of many scholars in the theoretical circle. The article points out that the enterprise market value and the choice of the way of financing the enterprise is not related, the different financing methods will not cause the difference in the market value of the enterprise. This thesis puts forward a perfect market system, which is put forward under the condition of strict hypothesis, that is, there exists a perfect competition market and the existence of information symmetry [3]. It can be known that it is not possible to fully meet these assumptions in the real environment. So, the theory has great limitations in practical application. But if we only consider its theoretical significance, the basic framework of modern enterprise financing theory is put forward. It can be said that after the scholars for the theoretical study provides a way of thinking. So many scholars have made further research on enterprise financing problems based on the development of theory based on theory, which makes the theory have been extended [4,5].

Corporate finance refers to the behavior of the listing corporation to raise funds from inside and outside of the company to realize the organization goal. As a kind of special form of enterprise organization, listing Corporation’s financing behavior has its own characteristics, but also has the characteristics of general enterprises. Comprehensive analysis, listing Corporation financing behavior has the following characteristics [6].

With diversified financing target, listed company’s diverse financing goal is mainly manifested in two aspects: one, if to enhance the value of the company for the purpose of, the financing behavior of listed companies sub goal can be diverse, including obtaining long-term stable money supply, lower capital cost, adjust the capital structure [7].

With flexible financing, listed companies directly face the capital market, and have a strong financing autonomy,

while the listed company can be flexible using financial instruments, such as bank credit, bonds, and stocks to raise capital. With complex financing decision-making mechanism, phase due to the listed company's financing decision as an important financial decision, usually need after discussion of managers, and then to vote by the board of directors and the general meeting of shareholders to through [8]. The relatively large size of the listed company, the financing way is flexible, the stakeholders involved in the financing behavior more influence on society.

Methods and materials

Artificial intelligence data mining

(1) Artificial intelligence

Artificial intelligence is mathematical logic, fuzzy mathematics, computer science, cybernetics, information theory, many disciplines of management science, physiology, psychology, linguistics and philosophy of mutual penetration of a new discipline comprehensive and developed [9]. The expert system of financial management is a program system of financial management knowledge, experience and skills, which is used to solve various problems in the financial field. Specifically, the expert system of financial management is mainly used to replace financial management experts for complex financial management process description, diagnosis, analysis and verification, as a combination of technology, philosophy and the environment of financial management and make the final decision (Figure 1).

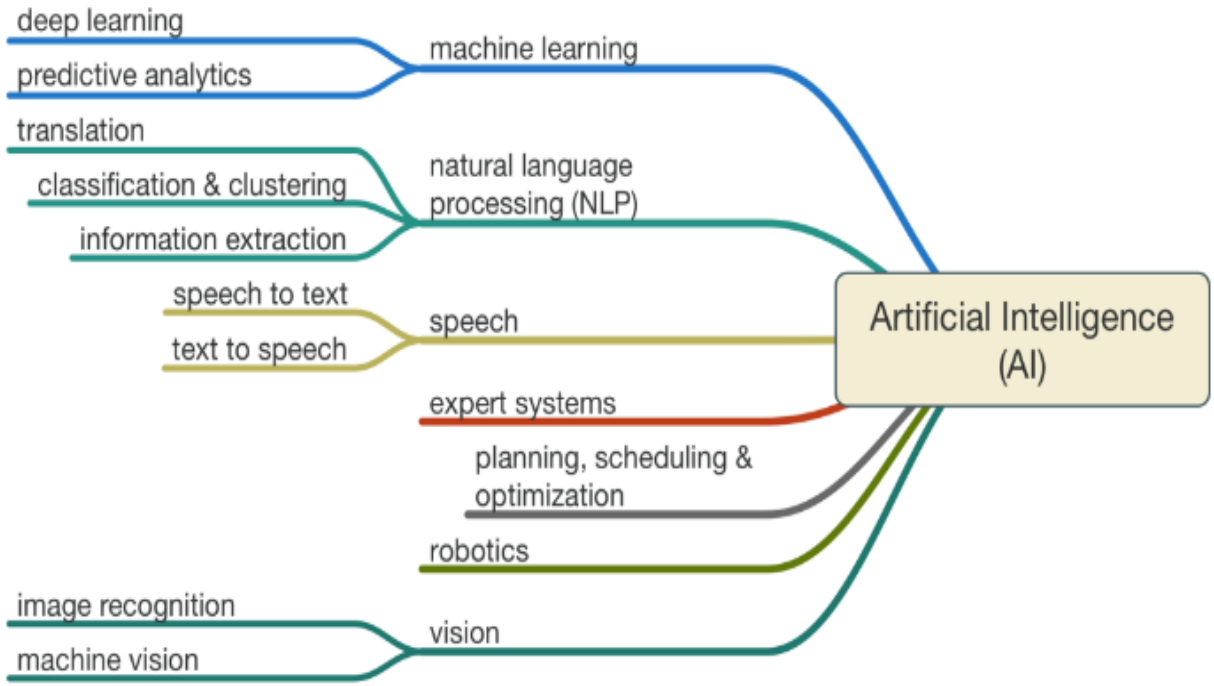

Figure 1. Artificial intelligence.

The idea of the financial management expert system is to decompose complex financial problems into some easier sub problems and then solve them by searching and solving the problems [10,11]. Intelligent expert system of financial management is the intelligent expert system. Intelligent expert system of financial management in the financial management of the content can be divided into financing management expert system (including capital management), investment management operation management expert system, expert system (including risk management, crisis management and distribution management expert system). Each of these systems can also be embedded in the financial planning and forecasting subsystem, the financial decision-making subsystem, the financial budget subsystem, the financial control subsystem and the financial analysis subsystem [12]. Through the integration of the system, the expert system of financial management functions plays the most incisive, financial prediction is more accurate, more scientific financial decision-making, financial budget will be closer to the actual financial control in place, a more thorough financial analysis, financial management is more comprehensive, comprehensive management of easy at the instant (Figure 2).

Figure 2. Financial management.

(2) Clustering method

The information obtained from financial analysis can provide decision basis for investors and managers [13]. The financial analysis mainly includes the analysis of financial data distribution, the structure factor and the index ratio. The main feature of data mining is that it can solve the problem of model and high efficiency by extracting, transforming and analyzing all kinds of financial data [14]. This requires enterprises to comprehensively analyze the internal and external business development situation and trends, the effective disclosure of financial information. Therefore, the use of data mining technology for the company's financial analysis and diagnosis is efficient and important (Figure 3). This paper is based on research results of scholars proposed data mining in the financial analysis diagnosis mainly used in one, the use of cluster analysis combined with financial ratios analysis can be sample enterprises are classified according to the clustering and grouping variables standard, can use comprehensive financial ratios, such as Z value comprehensive scores [15].

Second, to find the strong association rules, namely in the clustering analysis based on, enterprises will be different according to the condition of financial divided into several classes, then, use association analysis algorithm, to find the effect of each enterprise's financial situation of a variety of factors, through the inductive analysis, the strong association rules.

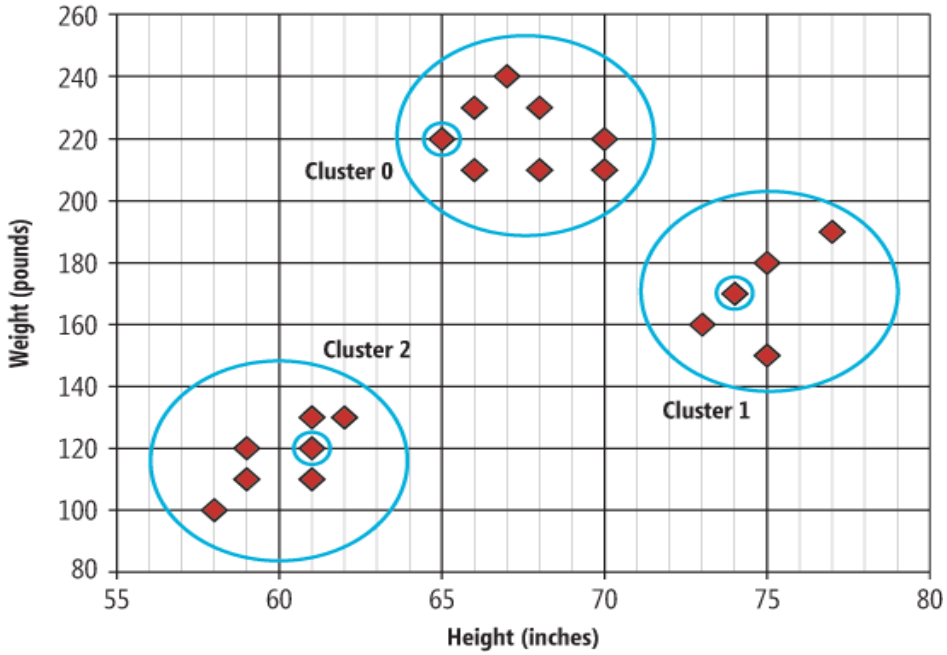

Figure 3. Cluster analysis.

Decision tree is a treelike structure that is like the flow chart, and it is an inductive learning algorithm based on an example. Using the decision tree method to classify, can be more intuitive to see the classification rules from the decision tree. The decision tree method has advantages of high speed, high precision and easy to generate results when processing many data sets [16]. Decision tree technology can be classified in this paper and the study of the case of the company's financial situation (Figure 4). From the root node to a leaf node of the recursion calculation and comparison tests in the process of attribute values, by different attribute value down recursive judgment, and ultimately in the leaf node of the decision tree obtained relevant conclusions by decision tree algorithm [17].

Decision tree algorithm can be divided into two categories: Based on information theory (including the ID series algorithm and C5.0 algorithm) and the minimum GINI index algorithm (including CARPT, SLIQ and SPWNT algorithm).

Financing Efficiency Evaluation Model

Construction of input output index

In the selection of the input indexes of corporate financing efficiency, considering the company gets financial capacity of input indicators should be the inclusion of asset size, capital structure, and financing cost. These three aspects respectively for the total assets of the company, assets and liabilities rate, total operating costs [18,19].

Total company assets (X1): The larger the size of the company, it is easier to raise funds to meet the needs of the company's production and operation. And then the scale of the company needs to raise the cost of financing the lower the company's financing efficiency is higher. Therefore, the index represents the size of the company's assets, can reflect the company's overall financing situation.

Asset liability ratio (X2): Asset liability ratio, also known as the financial leverage coefficient, from the perspective of capital structure reflects the impact on the efficiency of corporate finance.

Total operating cost (X3): Total operating cost is the company's daily operations and production activities; all costs must be put into operation. And the cost of the company's investment will affect the amount of output, thus the size of the total operating cost determines the size of the profit. The company's financing costs and the company's ability to fund operations can be represented by the index.

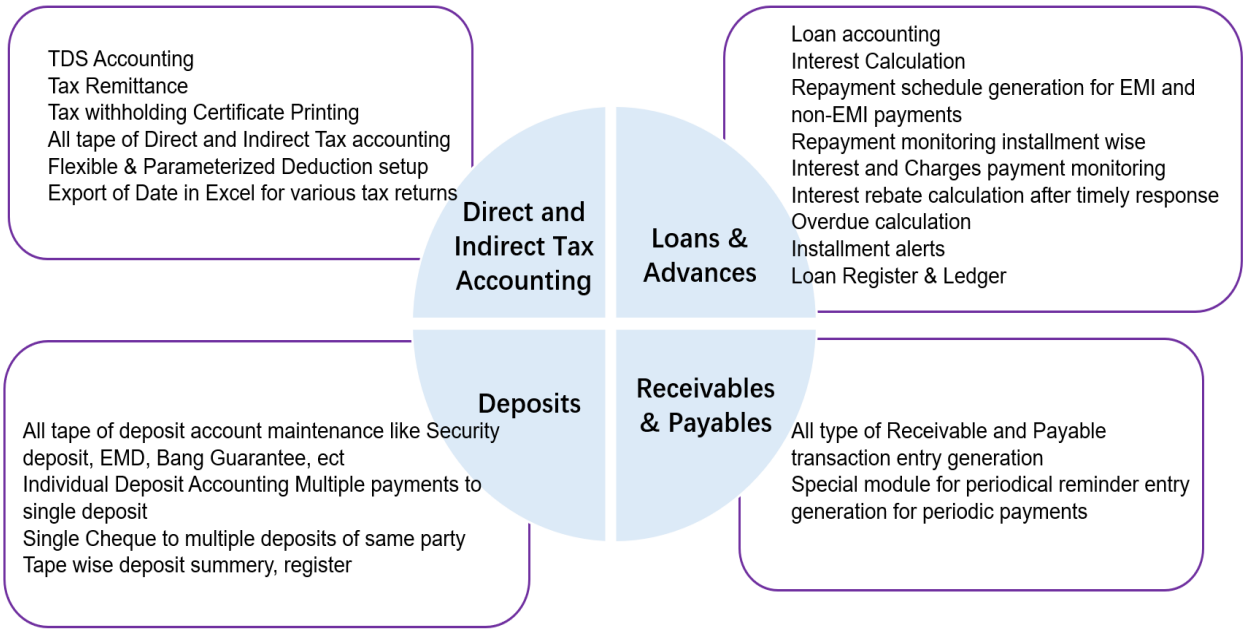

Figure 4. Financial management systems.

To clearly evaluate the efficiency of corporate finance output indicators, this paper is from the company's operating performance and efficiency of the use of funds to reflect the two aspects. Companies to raise funds for the use of funds efficiency, net assets yield as an indicator to represent, and operating performance is used to represent the net profit and operating income of the two indicators.

Net profit (Y1): Net profit is the result of a company's production and operation. The more often the net profit is, the better the performance of the company's production and operation performance is, and the less the net profit is, the worse the performance of the company's production and operation is. Net profit is the main index to measure the performance of the production and operation of the listing corporation.

Total revenue (Y2): Operating income is the main business of the company; it is an important guarantee for the company to make profits. The indicators can be integrated into the capital, the results of production and business activities.

Return on net assets (Y3): Refers to the profit margin and the average shareholder's equity ratio, the higher the index means the higher the income of the investment, and the higher the index, the weaker the profitability of the owners' rights and interests. The indicator reflects the company's ability to obtain net income from its own capital.

It's an important indicator to measure the profitability of a listing corporation.

Descriptive statistics

Through preliminary statistics and finishing this paper selected 20 manufacturing listed companies in 2013 to 2015 annual financial report, to the selected input indicators (total assets, assets and liabilities rate, business total cost) and output indicators (net profit, operating revenues, net assets income rate), simple data processing. Results are shown in Table 1 and Table 2.

Table 1. Manufacturing listing corporation DEA investment indicators.

Input index	Statistical indicators	Year		
		2013	2014	2015
Total assets	Maximum value	31720299	31863318	28504460
	Minimum value	271030	226854	163688
	Average value	3590843	3365043	2984349
Asset liability ratio	Maximum value	0.91	0.9017	0.9069
Asset liability ratio	Minimum value	0.3008	0.3203	0.3256
	Average value	0.59245	0.59774	0.62247
Total operating costs	Maximum value	45708769	40624659	34344447
	Minimum value	225003	239829	196513
	Average value	3957860	3737180	3331653

Table 2. Manufacturing listing corporation DEA output indicators.

Input index	Statistical indicators	Year		
		2013	2014	2015
Net profit	Maximum value	2075176	2022186	1372852
	Minimum value	2173	3104	3956
	Average value	181360	191583	172718
Total operating income	Maximum value	48097967	43480394	31337628
	Minimum value	232039	9573121	200756
	Average value	4106747	3918217	3244227
Return on net assets	Maximum value	0.966	0.4058	1.5996
	Minimum value	0.0036	0.0301	0.07
	Average value	0.14888	0.14602	0.27801

Results and analysis

DEA evaluation model

First, assuming that there are no decision-making units (DMU), any one of the decision-making units has an input vector X, an output vector Y. The decision-making unit (DMU), which satisfies the axiom of minimal and

ineffective, can be produced.

$$T = \{(X,Y) | \sum_{j=1}^{n} \lambda_j X_j \le x, \sum_{j=1}^{n} \lambda_j Y_j \le y\} \quad (1)$$

The following DEA model can be obtained.

$$\begin{cases} min[\theta - \varepsilon(\sum_{i=1}^{m} s_i^- + \sum_{r=1}^{s} s_i^+)] \\ s.t. \sum_{j=1}^{n} x_{ij}\lambda_j + s_i^- = \theta_x \\ \sum_{i=1}^{n} y_{rj}\lambda_j - s_r^+ = y_r \\ \theta, \lambda, s_i^-, s_i^+ \ge 0 \end{cases} \quad (2)$$

θ is a scalar, λ is the N×1-dimension constant vector. The θ is the DMU efficiency value, $0 \le \theta \le 1$. If these θ=1, then the DMU is in the efficiency frontier, which indicates that the DMU is in active state. Get technical efficiency (TE), through the comparative observation and analysis of manufacturing listing Corporation, if the level of technical efficiency is relatively high, it shows that it will be a variety of integration into the ability of the output in the middle level. By increasing investment, any enterprise can be proportional to expand production scale, which is returns to scale invariant (CRS) assumptions underlying meaning, namely technical efficiency value is not affected by the size of the enterprise. This does not conform to the actual situation. Therefore, based on the basic model of the previous DEA, we try to build the BCC model of financing efficiency.

$$T = \{(X,Y) | \sum_{j=1}^{n} \lambda_j X_j \le x, \sum_{j=1}^{n} \lambda_j Y_j \le y, \sum_{j=1}^{n} \lambda_j = 1, \lambda_j \ge 0\} \quad (3)$$

And then we can get the following DEA model.

$$\begin{cases} min[\theta - \varepsilon(\sum_{i=1}^{m} s_i^- + \sum_{r=1}^{s} s_i^+)] \\ s.t. \ \sum_{j=1}^{n} x_{ij}\lambda_j + s_i^- = \theta_x \\ \sum_{i=1}^{n} y_{rj}\lambda_j - s_r^+ = y_r \\ \sum_{j=1}^{n} \lambda_j = 1 \\ \theta, \lambda, s_i^-, s_i^+ \ge 0 \end{cases} \quad (4)$$

Calculation result

Under the above the DEA evaluation model on financing efficiency, through the use of data envelopment analysis software MaxDEA5.2 on the collected data processing, first of all to get 2013-2014 20 manufacturing listed company's overall efficiency, the technical efficiency (TE), pure technical efficiency (PTE) and scale efficiency (SE), specific calculation results are shown in Table 3 shows.

Table 3. Overall efficiency measurement results.

No	TE Score			PTE Score			SE Score			RTS		
	2015	2014	2013	2015	2014	2013	2015	2014	2013	2015	2014	2013
1	0.912	0.917	0.891	1.000	1.000	0.952	0.912	0.917	0.936	irs	irs	irs
2	0.842	0.904	1.000	0.851	0.912	1.000	0.989	0.991	1.000	drs	drs	-
3	1.000	0.838	0.915	1.000	0.839	0.916	1.000	0.998	0.999	-	irs	drs
4	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	-	-	-
5	0.849	0.873	0.867	0.859	0.877	0.875	0.989	0.996	0.990	irs	drs	drs
6	0.901	1.000	1.000	0.903	1.000	1.000	0.998	1.000	1.000	drs	-	-
7	0.749	1.000	1.000	0.947	0.990	1.000	1.000	0.791	1.000	irs	-	-
8	0.880	0.895	0.894	1.000	1.000	1.000	0.895	0.880	0.894	irs	irs	irs
9	1.000	1.000	0.985	1.000	1.000	0.985	1.000	1.000	1.000	irs	-	drs
10	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	-	-	-
11	0.842	0.904	1.000	0.851	0.912	1.000	0.989	0.991	1.000	drs	drs	-
12	1.000	0.838	0.915	1.000	0.839	0.916	1.000	0.998	0.999	-	irs	drs
13	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	-	-	-
14	0.849	0.873	0.867	0.859	0.877	0.875	0.989	0.996	0.990	irs	drs	drs
15	0.901	1.000	1.000	0.903	1.000	1.000	0.998	1.000	1.000	drs	-	-
16	0.749	1.000	1.000	0.947	0.990	1.000	1.000	0.791	1.000	irs	-	-
17	0.880	0.895	0.894	1.000	1.000	1.000	0.895	0.880	0.894	irs	irs	irs
18	1.000	1.000	0.985	1.000	1.000	0.985	1.000	1.000	1.000	irs	-	drs
19	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	-	-	-
20	1.000	0.933	0.894	1.000	1.000	1.000	1.000	0.933	0.894	-	irs	irs

According to the estimated results of the financing efficiency of the 20-manufacturing listing Corporation before the calculation results, this paper is divided into the statistics and classification, the results see Table 4.

Table 4. Financing efficiency.

Year	Sample firms	TE score		PTE score		SE score	
		No	Proportion	No	Proportion	No	Proportion
2015	Effective	7	35%	10	50%	8	40%
	Non effective	13	75%	10	50%	12	60%
2014	Effective	8	40%	11	55%	8	40%
	Non effective	12	60%	9	45%	12	60%
2013	Effective	9	45%	12	60%	11	55%
	Non effective	11	55%	8	40%	9	45%

The effective ratio of financing efficiency of China's manufacturing listing Corporation is relatively high. Among the 2013, 20 manufacturing listing Corporation, there are 9 companies that are both pure technology effective and effective, accounting for 45% of the number of enterprises, while the financing efficiency of non-effective enterprises accounted for 55%. In 2014, 20 manufacturing listing Corporation, there are 8 companies are both pure technology effective and effective, accounting for 40% of the number of all enterprises, while the financing efficiency of non-effective enterprises accounted for 60%. It can be known, 2013-2014, that the overall efficiency of the overall financing of the listing corporation to maintain a relatively high level, but with a slight downward trend.

Conclusion

(1) The survival and development of enterprises mainly rely on their own management ability, an enterprise wants to grow and develop, and it must have a high degree of understanding of its own illnesses and potential crisis, corporate financial data need to pay attention to. With the development of enterprises, the importance of financial diagnosis for enterprise management is becoming increasingly important. With the advent of the information age, information technology and application, the enterprise has entered a period of rapid development, if the information is the lifeline of the enterprise; the data is the blood flow.

Enterprises in the development process have accumulated a lot of business data, and the mining of these data will affect the business managers in a timely and accurate way to get the information needed for financial decisions. But at present, the commercial value of this business data has not been fully excavated and utilized.

Therefore, the use of data mining technology in the financial diagnosis of many financial data, from which to obtain an effective early warning, planning information, is the development trend of risk-oriented enterprise financial management.

(2) The perfect capital market and financial market system play a fundamental role in the financing decision of the listing corporation. Therefore, various measures should be taken to optimize the capital market and financial market.

First, continue to promote the reform of the state-owned commercial banks. The key to improving the safety and efficiency of bank loan funds is to promote the reform of the state-owned commercial banks. Second, enhance the bank's ability to control the camera. The bank's camera management mainly includes the prior reverse selection criterion, the moral hazard control in the event and the ex-post reorganization.

Enterprise more by the internal financing turn for the stock market financing, which means that in the enjoyment of a wide range of social resources at the same time, and to accept from the external supervision of market, the financing of enterprises not only to be more transparent in the data and on the independence of the challenge. Financing enterprises should expand financing channels, such as bonds, multi joint role, to provide effective protection for the development of enterprises.

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Conflicts of Interest

The authors declare no conflict of interest.

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