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The Optimization Analysis of the Communication Model of Negative Influence of the Entrepreneur's Social Relationship Change

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ABSTRACT

The change of entrepreneurial social relations will have a negative impact on the enterprise performance. There is a significant positive correlation between the change of entrepreneurs' social relations and the negative impact of corporate performance. In order to reduce the negative impact of the social relationship of entrepreneurs and improve the profitability of the enterprises, a communication model of the entrepreneur social relationship change and the negative influence of the enterprise performance is proposed based on the closeness decision. The communication model of the negative impact of the enterprise performance and the enterprise performance are analyzed. In the perspective of communication, the constraint objective function of the change of the entrepreneur's social relations and the negative impact of the enterprise performance is established, and the parameter model that affects the change of the entrepreneur's social relations and the negative influence of the enterprise performance is constructed and combined with the contribution weight and risk of the negative impact parameters of the enterprise performance. The fuzzy game decision model of the cost prediction of the change of the entrepreneur's social relations is designed. The decision model is built with the social relationship structure and the negative influence effect as the core variable, and the self-adaptive fuzzy game decision of the entrepreneur's social relationship and the negative influence of the enterprise is realized. The Hausman test rule is adopted. The statistical analysis of the cost-effectiveness of the changes in the social relations of entrepreneurs shows that the use of this model for the enterprise management can reduce the negative impact of the changes in the social relations of entrepreneurs, improve the enterprise performance and profitability, and optimize the efficiency of the enterprise management.

KEY WORDS: Decision-making, entrepreneur, firm performance, game, negative effect, social relationship change.

1 INTRODUCTION

THE entrepreneur's social relationship is an important social resource of enterprise, and it is also an important resource of the enterprise's production and management, especially for entrepreneurial enterprise. More and more scholars began to study entrepreneurship, many scholars did so based on the perspective of social relations. From the angle of the entrepreneur's social relationship, this paper studies how the entrepreneur's social relationship network influences the discovery, and how to obtain the resources such as information, fund, technology, talent and so on (Alessandro Beber et al 2013). The entrepreneur's social relationship plays an important role in the resources needed for entrepreneurship, and the change of the entrepreneur's social relationship plays a particularly important role in capital financing (OlesyaL obanova et al 2011).

In 1985, Aldrich and Zimmer proposed the method of the social network analysis to study entrepreneurship, rather than emphasizing the factors of personal traits or social environment (William F. et al2012). The social network analysis method can integrate the entrepreneurial opportunity level and the entrepreneur level well. Therefore, in recent years, more and more scholars began to use this method to study entrepreneurship (Scott Shane et al 2000).

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However, at present, most scholars who apply the social network analysis method to research entrepreneurship focus on the following fields: The impact of social networks on opportunity discovery, the impact of social networks on access to information, funds, technology, and the impact of the resources needed for talent entrepreneurship.

Most studies focus on successful entrepreneurs to study their social networks. But what about social networks in the early stage of entrepreneurship, the stage of entrepreneurial awareness (Aodheen O'Donnell et al 2001)? By studying the composition of the social relationship network, this paper explores the correlation between the entrepreneur's entrepreneurial consciousness and the social relationship network. It analyzes the negative influence communication model of the entrepreneur's social relationship change (BI S, 2015). This paper presents a communication model of the entrepreneur's social relationship change and the negative influence of the firm performance based on the closeness decision. From the perspective of communication, the paper establishes the constraint objective function between the change of the entrepreneur's social relationship and the negative influence of the enterprise performance, and it analyzes the parameter model, which influences the change of the entrepreneur's social relationship and the negative influence of the enterprise performance (Ulukus et al 2015). The fuzzy game decision model is designed to predict the cost of the change of the entrepreneur's social relations by combining the contribution weight and risk level of the negative impact parameters of the enterprise performance (Zhao N. et al 2015). Taking the entrepreneur's social relationship structure and the negative effect as core explanatory variables, the decision model of the closeness degree is established to realize the adaptive fuzzy game decision between the change of the entrepreneur's social relationship and the negative influence of the enterprise. Using the Hausman test rule to analyze the cost-benefit of the entrepreneur's social relations change, and finally to carry out the empirical analysis. The paper demonstrates the superior performance of this method in improving the negative impact of the change of entrepreneur's social relations on the analytical ability of the communication model (Okandeji A A, et al 2016).

Specific contributions of this paper include: Literature survey of various existing algorithms based on the negative impact of the entrepreneurial's social relationship changes and analyse their advantages and disadvantages. This paper proposes a communication model of the entrepreneurial's social relationship change based on the intimacy decision-making and the negative impact model of the enterprise performance. Perform better performance analysis than other existing algorithm models and algorithms and show the impact model for the enterprise management can reduce the negative impact of the entrepreneurial's social relationship changes, improve corporate performance and profitability.

Finally optimize the efficiency of business management (Zhang R 2013).

The rest of this paper is organized as follows: Section 2 discusses the constrained variable analysis and mathematical modelling. The optimal design of the propagation model is discussed in Section 3. Section 4 concludes with summary and future research directions.

2 THE CONSTRAINT VARIABLE ANALYSIS AND MATHEMATICAL MODELING

2.1 *The Study Sample and Attribute Description of Social Relations*

THE entrepreneur's social network structure includes four elements; sample, relationship type, relationship content and analysis level of data. The sample of this paper is to study the entrepreneur and its social network. We choose the actual controller of the enterprise whose registered capital is less than 500000 as the object of study (Wang Y et al 2016). The relationship type and content; relationship type and relationship content reflect the nature of the social network connection. This paper examines three representative relationships: (1) Transaction relations; relationships arising from the processing of transactions. (2) Communication relationships; relationships between individuals and individuals as a result of language communication. (3) Emotional relationships; personal and personal emotional communication. The relationship type refers to the attribute of the relationship (Li C et al 2016). Aldrich and Zimmer define the three dimensions of the relationship type (Wang R et al 2013); affinity, accessibility and scale. (1) Affinity refers to the degree of closeness of relationships with persons or objects that have an important influence in social networks, and is one of the important indicators of the strength of the social network relationships (that is, the strong or weak relationship between the types of relationships).

(2) Accessibility refers to the formation of networks. The degree of ease of communication between staff, it is possible to increase the degree of network arrival by introducing the middlemen. (3) Scale, which refers to the number of social networks, that can increase the possibility that network members can obtain resources from the outside world (Lu X 2015).

Research levels: There are many different levels of research that can be selected after samples, relationship content, and relationship types are selected. In this paper, we choose the simplest layer, that is, the self-network layer of the object, which includes the central node (the object itself), the other

nodes (the members of the social network of the object) and the relationship between the central node and other nodes. In the process of collecting data, randomly selected were the micro-enterprises registered in Guilin as the sample, mainly using face-to-face or telephone interviews. In the process of the interview, the interviewees were asked whether there were insufficient funds in the process of starting a business. Whether the answer was attributed to the entrepreneurs with strong financing problems and the entrepreneurs with weak financing ability (Feng W et al 2017). Then through the method of questioning was to try to understand the properties of its social network.

2.2   *Research Hypothesis*

On this basis, the following assumptions are given: (1) The composition of the social network members, the social network composition of the entrepreneurs without financing problems is not obviously different from that of the entrepreneurs with financing problems. However, the enterprises without financing problems have broader social networks. (2) The social relationship type, being entrepreneurs without financing problems have higher closeness than entrepreneurs with financing problems. This is because entrepreneurs who do not have financing problems tend to be extroverted and more likely to make friends with others. For accessibility, on the other hand, this is because the main social network members of the entrepreneurs with financing problems are family members, or close friends, who reach out to help when requested. On a scale, entrepreneurs who don't have financing problems have a larger social network, and they're better at making friends. Social resources are also relatively rich. (3) Relationship content show that entrepreneurs who do not have financing problems have a high proportion of social relations and communication in the content of social relations because they participate in more social activities. They deal with a lot of people and communicate with each other. In terms of emotional relationships, entrepreneurs who do not have financing problems have relatively less emotional communication, because their social networks are wider, and they are more likely connected.

2.3   *The Negative Impact Model of the entrepreneur's Social Relationship Change*

A set of multivariate linear regression models are used to establish the cost relationship model between the change of the entrepreneur's social relations and the negative impact of firm performance:

$$R_2^T R_2 = \{X_{d+1}, X_{d+2}, \cdots X_{d+m}\}\{X_{d+1}, X_{d+2}, \cdots X_{d+m}\}^T$$
(1)

The TVP-VAR-SV model is established. The DCC-MVGARCH model is used as the constraint model of the residual encroachment scale control under the incentive of the minimum entrepreneur social relationship change cost and the maximization product quality standard. The adaptive propagation equilibrium model of the production benefit management from the perspective of communication is described as follows:

$$S.t. \qquad Q_i \geq Q_{th}$$
$$E_i \geq E_{th}$$
$$C_i \leq C_{th} \qquad (2)$$
$$Q_{jk} \geq 0, E_{jk} \geq 0, C_{jk} \geq 0$$
$$\sum_{j=1}^{Nj} x_{jk} = 1, \forall i, 1 \leq k \leq M, 1 \leq j \leq N_j$$

In the asymmetric information environment, to establish the lifelong utility function of the corporate financial performance, it is necessary to promote the transformation of the enterprise scale through the adjustment of the entrepreneur's social relationship structure, and to optimize the negative impact of the enterprise performance. The risk indicates that the negative impact of the enterprise performance restricts the improvement of the product quality. According to the above mathematical model, the correlation test of the product quality evaluation and management is carried out, and the propagation equilibrium model is established to promote the optimization of the enterprise structure.

3   THE OPTIMAL DESIGN OF THE PROPAGATION MODEL

BASED on mathematical modelling, this paper analyzes the parameter model, which influences the change of the entrepreneur's social relationship and the transmission of negative influence of the enterprise performance. The design of the fuzzy game decision model based on the contribution weight and risk level to predict the cost of the entrepreneur's social relationship change in the DCC-MVGARCH model establishes the entrepreneur's social relationship changes and firm performance in the DCC-MVGARCH mode. The observational system model for the negative effects is expressed as follows:

$$\min_{\omega, h, \zeta_i, \zeta_i^*} = \frac{1}{2}\omega^T\omega + c\sum_{i=1}^{l}(\zeta_l + \zeta_l^*)$$
(4)

According to the above mathematical model, the Hausman test rule is used to analyze the degree of closeness, and the cost-benefit analysis method is used to analyze the change of the entrepreneur's social relations. The problem of the adjustment of the entrepreneur's social relationship structure and the negative influence of the enterprise performance is

transformed into a mathematical modeling problem of dualistic integral distribution.

$$\int_{t-\sigma}^{t} \begin{bmatrix} y(s) \\ f(y(s)) \end{bmatrix}^{T} \begin{bmatrix} R_1 & E \\ E^T & R_2 \end{bmatrix} \begin{bmatrix} y(s) \\ f(y(s)) \end{bmatrix} ds \qquad (5)$$

Based on the vector quantization evaluation and the production efficiency separation, the heterogeneity index analysis of the enterprises is carried out, and the financing decision status items of enterprises are obtained.

$$i = \max_{j} \left\{ P(Y \mid \lambda_j) / P(Y \mid \lambda_j) > P(Y \mid \lambda_T) \right\}$$
$$(j = 1, 2, 3, \ldots, C) \qquad (6)$$

Based on the adaptive equilibrium communication, the cost and cost control decision variables of the entrepreneur's social relationship change in the enterprise production are determined, and the indirect effect analysis model of the entrepreneur's social relationship change cost management and financial performance is established. Through the correlation analysis and significance test of the synthetic residual scale, the negative impact model of the enterprise performance is obtained as a two-order mixed function with parameters, which is expressed as:

$$M_v = w_1 \sum_{i=1}^{m \times n} (H_i - S_i) + M_h w_2 \sum_{i=1}^{m \times n} (S_i - V_i)$$
$$+ w_3 \sum_{i=1}^{m \times n} (V_i - H_i) \qquad (7)$$

Based on the parameter structure and constraint analysis on the negative impact of the quality of production and the performance of the enterprise, the input basis of the data parameters is provided for the communication decision. The negative impact effect of the enterprise's social relations change and the change of the social relationship of the entrepreneur x_1. The panel factor under the social relationship structure of the enterprise is x_2. The threshold scalar factor is x_3, and the enterprise income growth factor is x_4, which are determined by the checks and balances between the government and the enterprises .the constraint factors that describe the changes in the social relations of the entrepreneurs and the negative impact of the enterprise performance are shown in Table 1.

Table 1. The Constraint Factors to Describe the Changes of the Entrepreneur's Social Relations and the Negative Effects of Firm Performance.

x_1	x_2	x_3	x_4
0.00323	0.00432	0.00123	0.0345

According to the value of variables in Table 1, a close degree decision model is set up with the social

relationship structure and negative impact effect as the core explanatory variable, and the cost benefit optimization control equation of the change of entrepreneur's social relations is described as:

$$\max Z = \sum_{i=1}^{m} \sum_{j=1}^{m} x_{ij} c_{ij} \qquad (8)$$

$$st = \sum_{j=1}^{m} x_{ij} \qquad (9)$$

$$st = \sum_{i=1}^{m} x_{ij} \qquad (10)$$

$$x_{ij} = 1 \qquad (11)$$

$$st = 0, or, 1 \qquad (12)$$

where, $x_{ij} = 1$ indicates that the structure of the entrepreneur's social relations is used reasonably, and the negative effect is higher. $x_{ij} = 0$ means that the human resources are used rationally. It overcomes the negative influence of the enterprise's behavior on the enterprise's performance. $x_{ij} = -1$ indicates that the enterprise's assets turnover rate is better. By the above design, we realize the adaptive fuzzy game decision of the change of the entrepreneur's social relationship and the negative influence of the enterprise.

4   EXPERIMENTAL ANALYSIS

IN order to test the application performance of the mathematical model designed in this paper in realizing the change of entrepreneur's social relationship and the cost optimization control management of the entrepreneur's social relationship change, the empirical data analysis is carried out. The selected sample data is derived from the financial data of a listed company in China's A-share manufacturing industry from 2007 to 2017, which reflects the relevant information related to the negative impact of the changes in the corporate performance and entrepreneur's social relations. The original disclosure data is taken as the data of the research object. The software is Excel 2007 and SPSS 19.0. combined with Matlab mathematical programming. The mathematical model design and statistical analysis are carried out, and the cost-benefit statistical analysis of the entrepreneur's social relationship change is carried out by using the Hausman test rule. The statistical characteristics of the relationship between the change of the entrepreneur's social relationship and the negative influence of the firm performance are shown in Table 2.

Table 2. The Statistical Characteristics Analysis of the Relationship between the Change of the Entrepreneur's social Relations and the Negative Influence of the Firm Performance.

Variable	Negative impact of entrepreneurs		Evaluation of enterprise performance quality	
	Coefficient	Standard error	Standard error	Variance inflation factor
Constant	3.543	0.787	-	-
F3(x1)	0.598	0.454	0.456	1.787
F4(x2)	0.546	0.685	0.567	1.322
F6(x 3)	0.753	0.643	0.676	1.354
F7(x 4)	0.466	0.34	0.655	1.454

According to the above statistical analysis, the negative effects of the product quality and the firm performance are predicted, and the relationship between the negative impact of the change of the entrepreneur's social relations and the enterprise growth is shown in figure 1.

The prediction of the negative impact of the changes in the entrepreneurial's social relations is shown in Figure 2.

By the analysis of the above results, it is concluded that the adoption of this model can effectively improve the quality and efficiency of the company, reduce the negative impact of the changes in the social relations of entrepreneurs, improve the enterprise performance and profitability, optimize the efficiency of the enterprise management, and promote enterprise benefit growth.

Figure 3 to Figure 5 further illustrates the errors in the analysis of the negative impacts of the entrepreneur's social relationship changes using different methods when testing with various data sets.

It can be seen from the figure that the analysis algorithm proposed in this paper has a strong stability, and the concentration of the analysis error is relatively high under various test conditions. It also can be seen that the analysis of the negative impact of the entrepreneur's social relationship changes cannot only obtain smaller optimization analysis errors, but also effectively improve the quality and efficiency of the company, reduce the negative impact of the changes in the entrepreneur's social relations, and improve the enterprise performance and profitability, optimize and improve the enterprise management efficiency, and promote enterprise profit growth.

5   CONCLUSION

IN order to reduce the negative impact of the social relationship of the entrepreneurs and improve the profitability of the enterprises, a communication model of the entrepreneur's social relationship change, and negative influence of enterprise performance is proposed based on the closeness decision. The communication model of the negative impact of the enterprise performance and the enterprise performance are analyzed. In the perspective of communication, the constraint objective function of the change of the entrepreneur's social relations and the negative impact of enterprise performance is established, and the parameter model that affects the change of entrepreneur's social relations and the negative influence of enterprise performance is constructed and combined with the contribution weight and risk of the negative impact parameters of the enterprise performance. The fuzzy game decision model of the cost prediction of the change of the entrepreneur's
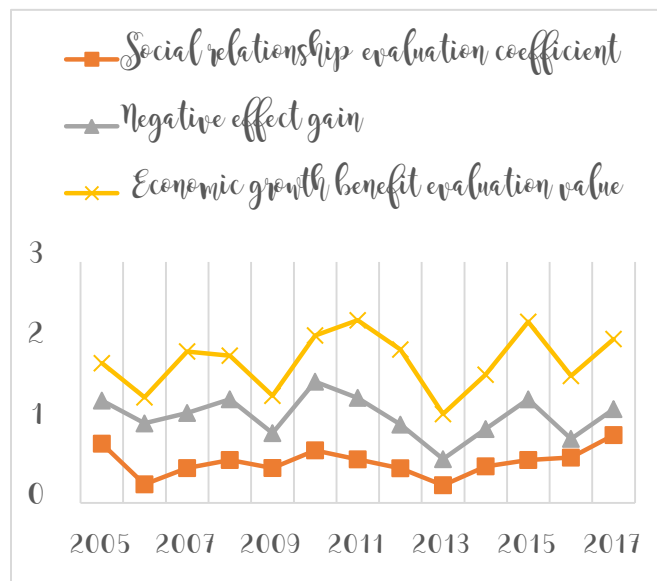

Figure 1. The Relationship between the Negative Impact of the Change of the Entrepreneur's Social Relations and the Growth of the Enterprises.
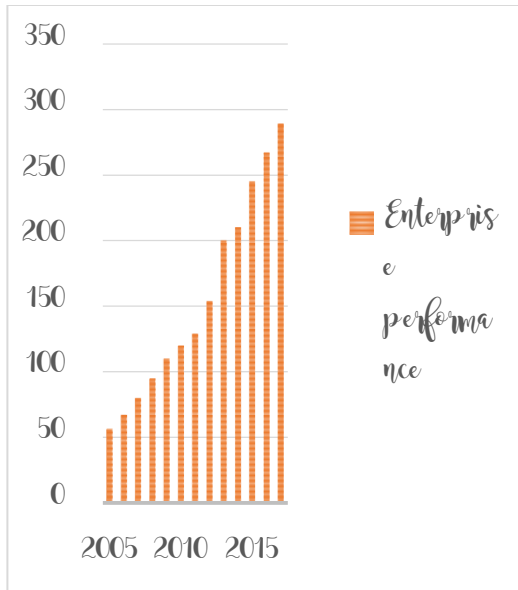
Figure 2. The Prediction Results of the Negative Impact of the Changes in the Entrepreneur's Social Relations.
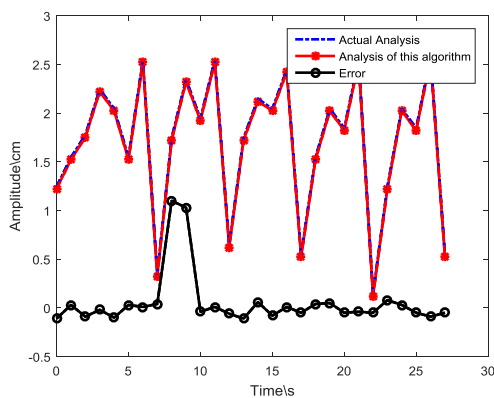

Figure 3. The Analysis of the Negative Influence of the Linear Model on the Change of the Entrepreneur's Social Relationship.
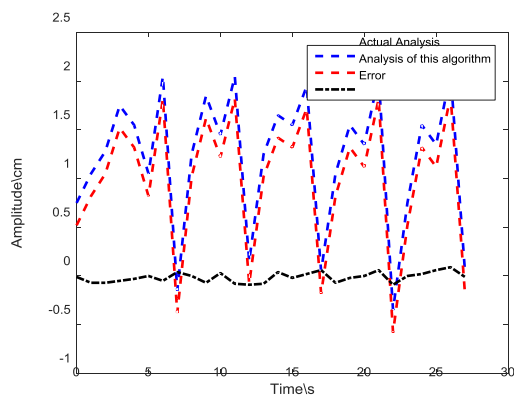

Figure 4. The Analysis of the Negative Impact of the Latest Sample Model on the Change of the Entrepreneur's Social Relationship.
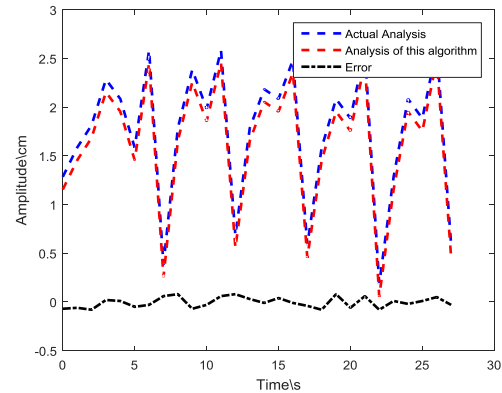

Figure 5. The Analysis of the Negative Influence of the Algorithm on the Change of the Entrepreneur's Social Relationship.

social relations is designed. The decision model is built with the social relationship structure and the negative influence effect as the core variable, and the self-adaptive fuzzy game decision of the entrepreneur's social relationship and the negative influence of the enterprise is realized and the Hausman test rule is adopted. The statistical analysis of the cost-effectiveness of the changes in the social relations of the entrepreneurs shows that the use of this model for the enterprise management can reduce the negative impact of the changes in the social relations of the entrepreneurs, improve the enterprise performance and profitability, and optimize the efficiency of the enterprise management. It has a good application value in business administration.

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7   DISCLOSURE STATEMENT

NO potential conflict of interest was reported by the authors.

8   NOTES ON CONTRIBUTORS

Linlin Zhang works at Hong Kong Baptist University. Research interests are social relations and communication skills.