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## Study on cooperative game of culture enterprise value create based on EVA

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### ABSTRACT

Exploration and research the value creation of cultural enterprises based on EVA is the fundamental need of enhance the rational knowledge, play a competitive advantage, promoting China's cultural enterprises scientific development, is the premise and guarantee to achieve economies of scale and auto power. In this dissertation, through theoretical analysis and empirical research, on the basis of construct cultural enterprises value creation theory framework based on EVA, by the method of literature, logical analysis, qualitative analysis and quantitative research method, systematic study the Interest game mechanism of cultural enterprises value creation based on EVA.

### KEYWORDS

Cultural enterprises; Value creation; EVA; Mechanism; Ability evaluation index.



## INTRODUCTION

Value creation is refers to the enterprise production, supply to meet the needs of target customers products or services of a series of business activities and its cost structure, including the value creation process of physics, value engineering and value creation process of sociological creation process. The value of the physics creation process is the enterprise through the raw material resources, financial resources, investment and use of human resources, information resources, create the value of the product, this product use value not only has material data input and conversion, including general abstract human labor. Therefore, in the value creation process of physics, scarce resources, technology, production organization, institutional arrangements are essential elements of value<sup>[1]</sup>. Value engineering creation process is the enterprise through resources continue to create process has certain functions of the product, the product is the function of society and human beings are the pursuit of material and spiritual goals, reflects the relationship between its function and cost. Therefore, value, function, cost and value engineering is the engineering created the basic elements of the process, reduce the production cost and realize the product function is the core of value creation<sup>[2]</sup>. Learn the creation process is the enterprise to the healthy development of the whole society as the goal value of society, to fully understand the nature and the society as the basis, properties and sources through the correct assessment of enterprise value, to create a rich and colorful products for the society<sup>[3]</sup>. Therefore, the understanding of the whole society and philosophy as the foundation, condensation in the product in the social value is the process of value creation society<sup>[4]</sup>.

EVA, economic value added (Economic Value Added, EVA), is a kind of enterprises to the total cost of net operating profit after tax and capital investment as the basic value creation level evaluation method, EVA is numerically equal to the balance of all capital cost of enterprises after tax net operating profit minus input after, put forward by the USA scholar Stewart, and by the America Stern Stewart consulting company (Stern Stewart & Co.) registered the implementation of financial management system, decision-making mechanism and incentive compensation system. The basic idea of EVA is, the value creation of enterprises depends on the corporate capital gains and capital cost, when the enterprise investment capital gains to compensate investors for the risk, return or shareholders at least making capital market similar risk return on investment, enterprises create value. EVA can evaluate enterprise effective use of capital and the ability to create value for shareholders, reflecting the enterprise value creation objectives, is to create the core and foundation of system of enterprise value<sup>[5]</sup>.

The culture of enterprise value creation is a multi-objective, multi-level, multi benefit relationship of input-output system, which determines the complexity mechanism to create cultural enterprise value based on EVA. Discussion on EVA culture of enterprise value creation mechanism based on solving the automobile manufacturing enterprise is the basic content of value creation.

## GAME FEATURES OF CULTURE ENTERPRISE CREATE VALUE BASED ON EVA

### Elements of game analysis

Made in the industrial chain based on the EVA culture value creation of enterprise stakeholders, restriction and influence must be influenced by other stakeholders, starting from the in interest or opposite position, one decision will no doubt give decision bring obstacle obstruct, or cause adverse factors, this is the so-called game.

The game theory between the equilibrium decision interests as the core research content, in theory, decision balance problem into noncooperation game and the cooperation game two. 50 in the cooperative game reached its peak, Tucker "prisoner's dilemma" and Nash equilibrium for non-cooperative game has laid a good foundation, then, other related scholars introduced a series of theoretical system under incomplete information game theory, to promote the further perfection, it is widely used in economic and management theory. Value creation as the enterprise strategic synergy vane, the ultimate goal of every enterprise is to maximize the value of. Cultural enterprises in the

process of value creation, study the interest parties each strategic direction, strategic synergy, and lay a solid foundation for value creation. Based on the resource, on the production and management, collaboration management of control, according to its own advantages, collaborative strategy is beneficial to the development of cultural enterprises, at the same time, stakeholders will study how to deal with the other members of the strategy, and strive to achieve the EVA as the core to realize value added. Therefore, the process of value creation and strategic synergy is to ensure its own value maximization at the same time, not only to adjust the overall strategy, but also adjust the body of individual members of cooperative strategy, interactive strategy intertwined network, which necessarily involves game analysis.

In the value analysis on the game, the inevitable factors should be taken into account in a balanced, benefit, information, rules, participants, policy and other basic elements. One participant means and cultural value creation of enterprise strategic synergy benefit all members, but the game when members strategy has the interdependence, so much the number of members is the key. Cooperative game in general two members, can be independent or joint enterprises in decision-making, it is the most mature, the most common and most common form of cooperation. And three or more strategic cooperative game, is to maximize the value of enterprises through alliances to gain.

Participation in the value creation, members of strategic coordination, according to the different level of economic and business strategy, strategy space is the Cartesian product of participating members. If the strategy space that members of the  $I S_i$ , you can define the  $N$  member value creation strategy for spatial strategic synergy:

$$\prod_{i=1}^n S_i = S_1 \times S_2 \times \dots \times S_n \quad (1)$$

Through the analysis we can see that, the number of strategy space increases with the number of  $N$  increased, according to the finite strategy synergy theory, by extending the method, gain matrix method or a simple set of all the countermeasure analysis, results and benefits are listed, but there is a difficult problem to solve is, said along with the increase of the number of members and become quite complex. Therefore, in general, only through the function or set of numbers to represent the infinite strategy.

Through the establishment of a binding scheme for the people involved, participate in value creation of strategic synergy action members in accordance with the order form rule. When there are multiple solutions, must act according to the rules of equality, for example, a single and multiple choice, simultaneously or successively choice.

Can improve the culture of enterprise action rules, operating characteristics of information elements, information can be natural selection in the cultural enterprise itself. According to the desirability and credibility of information is perfect, not perfect, when the members participate in value creation of strategic synergy is not fully grasp all the other members of the team, the strategic benefits of known as the "cooperative" incomplete information strategy, if the master is "collaborative complete information strategy". Specific performance for the overall benefit of strategic benefits, the cooperative as the whole, the overall benefit is obtained at a point of interest. Secondly, the respective interests of strategic synergy benefits also performance for participation in the value creation of strategic synergy of members, in order to form the overall interests of strategic synergy is to find the same interests focus on the interactive process, the overall benefit coordination which is the so-called strategy. Only the interests of the whole members participate in value creation of strategic synergy exists, there will be the existing members and individual interests, the two are complementary, interdependent relations.

Equilibrium refers to the members of strategic synergy in vivo, through the enterprise strategy optimization, are to achieve the benefits of relatively stable, which requires the enterprise common interests body member.

### The game analysis of expression

Standard type, characteristic function, extended three analysis methods of strategic cooperative game. While the standard type usually involves the following three aspects: each set of members participate in value creation of strategic synergy benefit, member enterprises and available to every member of the strategy of choice, in general:

$$G = \{s_1, s_2, \dots, s_n; u_1, u_2, \dots, u_n\} \quad (2)$$

In the standard type of collaborative n strategic description,  $S_i$  represents the strategy space of the  $i$  members,  $U_i$  represents the profit function of the  $i$  members. In addition, the "natural" selection, benefit functions, from the action of the information set, the interests of individual choice set of actions, action sequence and members constitute the six elements of expansion. The description is equivalent to the extended description in front of the standard theory of strategic synergy, when present in static state, mostly using standard game description method; and when the strategic synergy is a dynamic, more would choose the extended game description method. The feature function to describe the game analysis is nothing more than some real said the interests of the individual neutron strategy and cooperative parties, if the strategic synergy is member of strategy synergy should use numerical representation.

### Rationality of game analysis

The focus of connection of game theory and new classical economics is the rational. An enterprise can choose the economic development target by absolute rational decision-making, is reflected from the new classical economics, but this is only a hypothesis in logic. When this assumption did not encounter any time, gain is the biggest benefit. In fact, the absolute hypothesis is not exist, participate in value creation of strategic synergy exists in the member entity state, could not and related enterprises of all parties have nothing to do, consider the common value of all parties, because any one is not conducive to the overall decision will affect the other members of the value realization.

In the strategic coordination, the members of the individual action of the rational, not equal to the collective action of rationality. The first two are not the same decision path, path member reason alone is selected the "individual groups of individuals". The individual before the action is bound to the participation of members of the overall reaction to make tradeoff analysis, through the way the individual groups, and then return to the individual value, the path of the decision, even if the failure is also very small, so even if it is for self-selection direction, defect, rational knowledge are the error will not be too much influence the member itself, exactly it is taking a middle course. Decision path can participate in value creation strategy synergy is from individual to individual, so the individual evaluation error, will affect the entire enterprise.

Secondly, the two do not have the same level of rationality. Related enterprises should not only have individual rationality itself, but also the individual rational coordination, strategic cooperative interaction in rational valued function,, and the non-aligned members cannot be mentioned in the same breath analysis; third, refers to the common knowledge common knowledge of rationality and rational two aspects of knowledge, common knowledge generation, determines the strategic cooperative memory in the incomplete symmetry information, in order to achieve the common interests, it is necessary to search some information, so as to form a common. Fourth refers to members in learning or on the evolution of the "rational", mainly based on "limited rationality", the evolution mechanism and learning from the process, rational to members of the self-adjustment and self-learning. If you use the limited rationality of Simon to explain completely rational, it is only a kind of pure reason. If you use the limited rationality of Simon to explain completely rational, it is only a kind of pure reason. Game theory is very concerned about the existence of bounded rationality, thus through learning and evolution mechanism, to decision makers within the group, whether carried out in long time evolution and dynamics of learning, to achieve the Nash equilibrium.

In fact Nash equilibrium at the beginning of the advent of already and completely derailed rational behavior of the people, not the rational judgment to make a conclusion, at the same time, Simon also for

"group activities" and "rational" make the conceptual interpretation, Nash equilibrium behavior, is to study and extrapolation in rational before they can be reached is not rigidly adhere to the kind, Nash completely rational reasoning and intrapersonal can reach equilibrium. In fact Nash equilibrium at the beginning of the advent of already and completely derailed rational behavior of the people, not the rational judgment to make a conclusion, at the same time, Simon also for "group activities" and "rational" make the conceptual interpretation, Nash equilibrium behavior, is to study and extrapolation in rational before they can be reached is not rigidly adhere to the kind, Nash completely rational reasoning and intrapersonal can reach equilibrium. This advanced theory of invention, successful guidance of strategic synergy development [effective]. Members in the process many games, building mutual learning and evolution mechanism, achieve the decision-making behavior equilibrium, consistency, convergence degree, showing balanced feature of economic activity. Members in the process many games, building mutual learning and evolution mechanism, achieve the decision-making behavior equilibrium, consistency, convergence degree, showing balanced feature of economic activity. This is the basic strategic cooperative game, Nash equilibrium formation of learning and extrapolation, can through the practice of insight and reasoning, obtain complete rationality Nash equilibrium of nothingness.

### ANALYSIS COOPERATIVE GAME TO VALUE CREATION

Between the so-called strategic synergy is to participate in value creation strategy cooperative members, different types of resources and related resources re allocation, make capital, competitive advantage, the demand information and other resources to generate value feedback, thus the value creation strategy of collaborative research should adopt the cooperative game theory to analyze, and the game's focus, should be the production and business operation how to construct, how effective different types of resource configuration, different trading after the creation of the surplus should be how to allocate. Only through strategic equilibrium concept, can facilitate the integration of industrial chain of resource allocation and the production and business activities, in order to realize the strategic balance to ensure the realization of the value of the parties.

The process of creating value allocation of resources, production and management control activities and management research can use the game theory and its characteristic function method are described. The characteristic function for the study of the relationship between a particular resource or activity and value creation, it shows that the value of every possible combination of resources and value activities of the. For example: the value in M configuration resource x, then the event created value is V (m, X). The production and operating activities and the allocation of resources the value space may be all the functions, implication is a kind of resource allocation and a production and business operation activities can produce a kind of value, if the two kinds of resources and a production and business operation activities may have three kinds of portfolio value generation. Can draw a conclude: the configuration of the K resources in a value activity, total value can be expressed as  $2k-1$ , the characteristic functions of different allocation of resources value. If the resource type is k, value activity for I ( $i < k$ ), then the best describes the configuration characteristic function value is V, the formula is as follows:

$$v = \binom{k}{i} \times i! \times i^{k-i} \quad (3)$$

#### Complementary resources to create value

The different types of resource re allocation, to participate in value creation strategy cooperative member value activities, to inject new energy into the original value activities of natural resources, will produce a new value. If no complementary, so with the characteristic function description of the resource can only be with additive.

$$v(m, x_1 + x_2) = f(m, x_1) + c(x_2) \quad (4)$$

Among them,  $c(x_2)$  indicates that the resource  $x_2$  external opportunity cost. There are many different kinds of resources in the industrial chain, if the upstream and downstream complement each other, or for specific cooperation, equal to multiple resources in a same value activities harvest super additive. Meet:

$$f(m, x_1 + x_2) \geq f(m, x_1) + c(x_2) \quad (5)$$

Through the value activities, different individual culture in the enterprise value chain can be conducive to the development of their own resources, may also be due to external factors, individual resources to bring cultural enterprises, re configuration will produce more than the original value activities in the value of re allocation, which have benefited from the resources of trading. The external costs of this case, make the new value to another value creation cost.

### **Production and business operation activities co create value**

In the opinion of Michael Potter, the strength and the adaptive source performance difference enterprise on its own, different enterprise external industrial structure's ability to adapt to different, can produce different performance. While the culture of their own strategic positioning, is because of its own competition strength of the decision, the adjustment and the use of the production and business operation activities, can enhance the cultural competitiveness of enterprises. Different production and operation activities arrangement, will generate different competitiveness in the industry, usually the different arrangements, performance is different characteristics, called cooperation for the production and operating activities. In the value chain of cultural enterprises and cultural enterprises cooperative strategy, value chain re formed, will have different competitive advantage emerged, creating a different value. So the number of cultural enterprises of strategic synergy, re select the cultural production and business activities of enterprises, based on the formation of the value system, generate synergistic effect. If there is no cooperation, then the characteristic function have the additively, i.e.:

$$v(m_1 \oplus m_2, x_1 + x_2) = v(m_1, x_1) + v(m_2, x_2) \quad (6)$$

The  $m_1 \oplus m_2$  said the integration of two kinds of production and operating activities.

If a production and business operation activities with synergy, so activities has the ultra-additively, i.e.:

$$v(m_1 \oplus m_2, x_1 + x_2) \geq v(m_1, x_1) + v(m_2, x_2) \quad (7)$$

Value is generated for the production and business operation activities in different resources of the A and B members of the re allocation of the. Aggregate production and business activities can be described as a resource, the collaborative process of production and business activities are complementary or re create new value of resources. Michael Potter believes the value will not be generated in the complementary resources, his reason is resource is the procurement, or generated by performance activities, which can not be replaced. However, from the perspective of the value chain analysis is not, the production and business operation synergy and complementarity of resources will have a value.

Participation in the value creation activities of the members of the A and B strategic synergy, the link between cultural production and business activities of enterprises and create value. Between A of the production and business operation activities of  $m_{ai}$  and B of the production and business operation activities of  $m_{bj}$  integration and synergistic effect, can be expressed as:

$$\begin{aligned}
 v_{m_{Ai} \oplus m_{Bj}} &= v(m_{Ai} \oplus m_{Bj}, (x_{Ai1}, x_{Ai2}, \dots) + (x_{Bj1}, x_{Bj2}, \dots)) \\
 &\geq v(m_{Ai}, x_{Ai1}, x_{Ai2}, \dots) + v(m_{Bj}, x_{Bj1}, x_{Bj2}, \dots) = v_{m_{Ai}} + v_{m_{Bj}}
 \end{aligned}
 \tag{8}$$

The advantages of co culture of business strategy is to get rid of the fetters of the original value chain, optimization of resources after the re construction of the production and business operation activities, so as to seek cultural enterprise itself can produce in the value activities of the new performance. Michael Potter insists on his view, only the difference of individual enterprises in the adjustment of industrial structure of external, will generate business performance, but he also believes that the competitive advantage of enterprises, can improve by adjusting the production and operating activities. In the opinion of Michael Potter, enterprises should take the initiative with other stakeholders frame production and operating activities, through the integration of resources, to obtain greater value. Therefore, if the cultural enterprises have the ability to integrate resources enough, it should be possible to play the advantage be richly endowed by nature, to create new value for the enterprise. However, cultural enterprises are often due to their own resource constraints, lost the re integration of the opportunity and ability. Therefore, culture can be a reasonable allocation of resources to different production and business activities, to create new value through value chain.

**Management control transactions for value**

The so-called management control, is the enterprise culture has its own resources, balance allocation of resources optimization problem, the limited resource allocation to the value of activities, and through value activities effectively in the culture of enterprise value creation, such as budget management, cost management and transaction control.

You can determine the value is created through the resource management control or complementary resources, the re allocation of resources to obtain. Culture of enterprise resource advantage, can be reconfigured in the value chain, and generate interest. The added value of the resource management control can be expressed as:

$$f(m_1, x_1) + f(m_2, x_2) < f(m_1, x_2) + f(m_2, x_1)
 \tag{9}$$

If the formula (9) condition, called added value activities M1 and M2 will produce the management control in the resource X1 and resources under x2. Thus, can be configured to value activities is the cultural resources of the enterprise. If the resource environment specific configuration, also means that the complete value creating the most reasonable "matching", this is the premise of interest. Focus on the culture within the enterprise, will be re allocation of resources value activities, can gain maximum; focus on the cultural industry chain enterprises, enterprises of different culture if there are resource control, can make both sides to produce new values.

If the culture enterprise internal K resources (x<sub>1</sub>, x<sub>2</sub>, ..., x<sub>k</sub>) is assigned to I production and operating activities (m<sub>1</sub>, m<sub>2</sub>, ..., m<sub>i</sub>), in which there are some resources on the production and management activities to meet the requirements of the formula (9), and the characteristic function is known, then there must be a configuration makes value creation activities to maximize the benefit of. Due to resource allocation is carried out in the culture within the enterprise, so as long as the implementation of control activities of value-added, the exchange of resources allocation can achieve value creation.

A resource allocation method is  $\sum = \varepsilon_1, \varepsilon_2, \dots, \varepsilon_i$ , wherein  $\varepsilon_i$  represents a combination of resources production and operating activities of m<sub>i</sub>,  $\Omega$  there is space allocation of resources. Distribution includes the following combination:

$$\Omega = \binom{k}{i} \times i! \times i^{k-i}
 \tag{10}$$

Type indicates that the distribution is limited, because the characteristic function is known, so there must be a way to maximize allocation to achieve value creation.

$$v_{\max} = \max \sum_{i=1}^k v(m_i, \varepsilon_i) \quad (11)$$

For the parties involved in the culture of enterprise value creation, members must also go to participate in the allocation of resources to achieve value creation, which meet the following conditions:

$$f(m_1, x_2) \geq f(m_1, x_1), f(m_2, x_1) \geq f(m_2, x_2) \quad (12)$$

## CONCLUSION

Exploration and study of EVA culture of enterprise value creation based on the problem of enhancing the rational knowledge, play a competitive advantage, the fundamental need to promote scientific development of China's enterprise culture, is the premise and guarantee to achieve economies of scale and powerful cultural country. In this paper, based on the capability, mechanism and management to solve the problem of China's culture of enterprise value creation, will be the core concept of EVA and cultural enterprises of China's realities, explore the problem of creating EVA culture of enterprise value based on the game mechanism analysis, the value creation, which provides a practical guidance to improve China's cultural enterprise value creation ability, provide decision-making basis for government departments.

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