



# Business Negotiation Strategy and Method Analysis Based on Game Theory

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**Abstract.** Business negotiation refers to the process in which different business subjects negotiate on specific business items to pursue common business interests and reach common business goals. Business negotiation is widely used in society, and both sides will encounter various risks and uncertainties in the negotiation. This paper is based on the analysis of risks and uncertainties in business negotiation, the game theory concept model and its related applications are used to explain the problems encountered in business negotiations and their solutions. Finally, the conclusion that the betrayal and deception of both sides in negotiation are due to the principle of self-interest and the choice of maximizing the interests of rational people is drawn. And found that the two sides trust each other to choose cooperation as the best choice for mutual benefit. This paper provides some negotiation skills for those involved in business negotiation in different situations, such as the weak party delaying negotiations, the two sides trying to reach a Nash equilibrium, and the strong party reasonable pressure.

**Keywords:** Business negotiation, Game Theory, Negotiation skills.

## 1 Introduction

The pursuit of interests drives people to accumulate capital continuously and expand the operation, the rapid development of productive forces, and contacts between enterprises are increasingly frequent, with the continuous expansion of trade, negotiations between enterprises are more and more, playing a very important role. Not only for the benefit of the enterprise, but also for the development of the enterprise, business negotiations, are to negotiate with people, the quality of the negotiators at the business level directly affects the effectiveness of the negotiations, and then affects the enterprise, the benefit, therefore, the construction of the negotiation team is also directly related to the success or failure of the enterprise, the two complement each other, together for the development of the enterprise into fresh vitality. Most of the business negotiations are conducted between enterprises, enterprises, and other departments, each enterprise through communication and contact with other departments or units to complete production and operation activities. Through business negotiations, enterprises achieve the best combination of capital, technology, equipment, raw materials, and labor. Through negotiations to solve transactions and production and management activities involved

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in various issues. As a result, business negotiations have become a medium of communication between various economic phenomena, strengthening the relationship between enterprises and serving as a bridge and link between enterprises in economic relations. Therefore, mastering business negotiation skills and being able to make profit-maximizing choices based on actual situation analysis is crucial for enterprises. Game theory is to study people in the pattern of mutual influence of interests in the choice of strategies, is to study the theory of multiple decision-making problems. Strategic Choice is at the heart of People's economic behavior. Moreover, economics and game theory have the same research model, which emphasizes individual rationality, or the pursuit of Utility maximization problems under given constraints. Economics and game theory are intrinsically linked. Therefore, this paper links business negotiation with game theory and discusses the business negotiation strategy based on game theory.

## **2 Elements of Business Negotiation**

In business negotiations, both parties need to have sufficient, effective, and accurate communication to solve the contradictions and conflicts they face and achieve a satisfactory negotiation result for both parties. Communication plays a crucial role in negotiations. Many things can be exchanged and communicated in negotiations, such as each other's perspectives, feelings, preferences, expectations, etc. [1]. Therefore, a good command of negotiation skills on the outcome of negotiations is of great help.

### **2.1 Language Communication Skills**

In business negotiation, language communication mainly includes "Speaking" and "Listening". When the negotiators express their views, people need to pay attention to the wording and tone of voice, so as not to cause misunderstanding and unhappiness. For example, when the two sides of a negotiation can not reach an agreement on the price of commodities, leading to an impasse in the negotiations, a negotiator who says that agreement is hard to reach is likely to create negative feelings on the other side of the negotiation, which will affect the negotiation process. If the negotiator changes to a more positive, more constructive way of expression, then it may not have the same effect [2].

Therefore, language plays an important role in negotiations. The two sides should express the positive and friendly side through language, which is more conducive to negotiations

### **2.2 Non-Language Communication Skills**

In business negotiations, in addition to language and communication, non-language communication, and communication also play an important role in the negotiations. For example, many psychologists can read a lot from negotiators' body language and micro-expressions. If the negotiator's arms cross in the chest, then often shows a negotiator's defense psychology. If the negotiator's hands look like a minaret on the chest, then it

may indicate that the negotiator has, a psychological sense of superiority, that their status is above the other, that they are better than the other side.

Therefore, to achieve better communication effectiveness in business negotiations, both parties need to fully utilize both verbal and nonverbal communication methods for effective communication.

### **3 Possible Problems in Business Negotiations**

In business negotiations, the two sides often encounter some problems, so the negotiations can't be carried out in the expected direction.

#### **3.1 Information Asymmetry**

One is information asymmetry, also known as negotiating parties have different information or do not know each other's information. With the development of information technology, people have more and more access to information, access to information faster and faster, and information in international business negotiations plays an increasingly important role. However, based on self-interest comes before self-interest, and people tend to make decisions that benefit them without Information asymmetry or transparency.

Opportunism in Information asymmetry theory is one of the important factors that cause information errors in business negotiations. Opportunistic behavior refers to people who do not fully disclose all information and engage in other self-serving behaviors in Information asymmetry situations. Usually with false or empty, unreal threats or promises of personal gain. Such as false advertising, patent plagiarism, tax evasion, default, and lazy behavior. New institutional economist Williamson believes that people always do their best to protect and increase their interests in economic activities. Selfish and at the expense of others, as long as there is a chance, will be at the expense of self-interest.

According to the research demonstration, suppose A and B are the two parties to the negotiation, and a company gets more information than B Company. At the beginning of the negotiations, enterprise A was in a good position. The opportunistic tendency of enterprise A leads enterprise A to make use of the disadvantageous position of enterprise B to exert pressure on enterprise B to gain more benefits [3]. At the same time, in the process of business negotiation information display, Enterprise A provides uncertain information to enterprise B, and conducts information fraud to mislead enterprise B, the attempt to obtain false information puts Enterprise B at an even greater disadvantage in the negotiations. Because of the level difference between the two negotiators, the task of the negotiator of enterprise B is more difficult than that of enterprise A, so enterprise B is in a disadvantageous position, and enterprise A is more active. In the following negotiations, because in the previous negotiations, enterprise a had the upper hand, and enterprise B was in a more disadvantageous position, enterprise a would appear more aggressive, more opportunistic behavior leads to an increase in the negotiating objectives of firm A, which puts more pressure on firm B. This example

reflects the chain reaction in business negotiations where the weak are weaker and the strong are stronger.

### 3.2 The Prisoner's Dilemma

Game theory is not only a new branch of modern mathematics but also an important subject of operational research. Game theory is used in Information asymmetry situations where the negotiator is playing the game.

Each person makes decisions and actions based on the possible reactions of others. Making strategic decisions and taking strategic actions in a strategic environment is called "Game", and the special research on how to make the game is called "Game theory". Some examples of game behavior: cooperative games are games in which some players play through alliances and collaborations, and game activity is a confrontation between different groups. In the cooperative game, the participants do not have to cooperate, but the external organization will punish the non-cooperative. [4]. The non-cooperative game refers to a non-cooperative framework that considers everyone's actions as individual actions in a strategic environment. It focuses on one person making autonomous decisions independently of others in a strategic environment.

Based on game theory, mathematician Albert first proposed the prisoner's dilemma model, which assumes that two criminal suspects [5]. Party A and party B, are arrested if both parties choose to cooperate and not confess, if party A cooperates in not confessing and party B confesses, party A will be convicted for five years and party B will be acquitted. On the contrary, if party B cooperates in not confessing and party A confesses, party B will be convicted for five years and party A will be acquitted. Finally, if both parties choose to confess, both parties will be convicted for three years. The decision-making of a single individual tends to maximize the individual's interests. The expected maximum benefit can be obtained by choosing to confess, but according to the analysis of the prisoner's dilemma model, it will lead to the maximum loss of the interests of both parties. The best option for both parties in this situation is to continue to cooperate and refuse to confess. Based on the above analysis, a classical prisoner's dilemma model can be constructed, the results are shown in Table 1.

**Table 1.** The prisoner's dilemma model [5].

Prisoners' dilemma	Party B	No Confession	Confession
Party A			
No Confession		1.1 years	5.0 years
Confession		0.5 years	3.3 years

The prisoner's dilemma is a typical example of non-zero-sum game in game theory, which shows that the individual's best choice is not the group's best choice [6]. Although the dilemma itself is only a model, the reality of price competition, environmental protection, interpersonal relations, and other aspects, there will be frequent similar situations. The prisoner's dilemma reflects the profound problem that individual rationality of human beings can sometimes lead to collective irrationality-that intelligent

human beings can trap themselves in their cleverness, or harm the interests of the collective.

In real business negotiations, there is also a prisoner's dilemma game: two companies compete with each other, and the profits of the two companies depend largely on advertising, that is, a company's advertising that is more acceptable to the customer will take away the other part of the income. However, if the two companies are at the same time the quality of similar ads, revenue increases little but advertising costs increase significantly. But if not improve the quality of advertising, businesses will be taken away from each other [7]. Both companies have two options. First, cut a deal with each other to reduce advertising costs. Second, increase advertising spending, try to improve the quality of advertising, and overwhelm each other. If two companies do not trust each other and can't work together, then when betrayal becomes a Strategic dominance, the two companies will be caught in an advertising war, and the increased cost of advertising hurts the profits of both. This is the prisoner's dilemma. In reality, however, it is more difficult for two competing companies to reach a cooperation agreement, and most of them are trapped in a prisoner's dilemma.

### 3.3 Cheating

Due to the repetitive and non-short-term nature of negotiations in real life, the negotiation parties are often influenced by their past negotiation experience with the adversary when making behavioral decisions, they also need to consider the potential role of the process and outcome of this negotiation for future negotiations.

The use of deception in negotiation is a hot topic in the field of negotiation research. Many scholars have previously defined what it means, such as deliberately misrepresenting information or emotions in negotiations [8]. Gaspar & Schweitzer also talked about deliberately misleading statements or actions [8]. Gaspar's deception consequence model argues that Deception strategies have different dimensions. According to the intention or purpose of deception, deception can be divided into deception that harms the opponent and deception that favors the opponent [8]. The former benefits themselves at the expense of their opponents and can be divided into emotional deception and information deception according to the content of the deception. The forms of deception can be divided into Omission-where the negotiator does not disclose relevant information, Commission-where the negotiator offers to give false information, and Paltering-where the negotiator misleads the other party with true information [8].

According to Lewicki and Litterer, lying and cheating are an integral part of effective negotiation. If people bargain everything, especially the minimum requirements, or give up the point of negotiation to the other side, the person lost the bargaining chip. Therefore, to be able to negotiate effectively, especially in a competitive environment, it's in the interest not to be completely honest with an opponent. But on the other hand, if people lie from the beginning, without telling the truth, the person will not be able to reach any meaningful agreement, because the other side will think the person lacks the sincerity to negotiate. O'Connor and Carnevale argue that using deceptive negotiating tactics can improve outcomes [9]. If a person is selling a used car, the one probably just emphasizing the car's merits without mentioning the engine's poor condition to the

buyer. Doing so can also improve the outcome of negotiations, and enhance the satisfaction of both sides, but not conducive to long-term cooperation between the two sides.

Of course, if the person knows what the other side wants and what the bottom line is, the person will have the upper hand in negotiations. There must be lies in negotiations. Cheating in negotiations is foreseeable, so it is morally acceptable, for example, to deliberately exaggerate the benefits to the other party and say that others don't know when these humans know, it's not lying when the person makes small concessions, saying that is big concessions, etc. but it's a tactic to use negotiating skills. Whether the other side or our side, honesty in negotiations is always limited, the use of certain strategies and techniques, such as game theory, can achieve a win-win outcome in negotiations. Therefore, in business negotiations, be especially careful of each other's lying and deception.

## **4 Suggestions for Business Negotiation from the Perspective of Game Theory**

The application of game theory in business negotiation can explain the common problems of information asymmetry and negotiation parties' distrust leading to betrayal and cheating each other to advance their own interests.

### **4.1 The Insubordination of the Weak Side**

Since both sides have the same ability and level of access to information at the negotiating table, to obtain more information, the conclusion of the contract will be delayed or the issue will be shelved under some pretext, causing pressure on the dominant side of the enterprise. On the one hand, if a business negotiation breaks down, there is no economic benefit for the dominant company. From a psychological point of view, the advantaged side is more profitable than the disadvantaged side of the enterprise, and will pay more attention to the success of negotiations. On the other hand, every negotiation has to cost, for the rational economic man enterprise, is not willing to spend more benefits at the negotiating table. Weak companies have delayed signing contracts or shelved the issue to put pressure on powerful companies to get the right high-quality information from negotiators to balance the two sides' messages [10].

### **4.2 The Realization of Nash Equilibrium**

Nash equilibrium is a sub-concept of game theory. Companies can use the Nash equilibrium theory to assist business negotiations.

Suppose there are  $N$  players in the game, and if no player can increase the payoff by acting alone, then this strategy combination is called a Nash equilibrium. All the player strategies form a strategy combination. Nash equilibrium, in essence, is a non-cooperative game state [11]. When Nash equilibrium is reached, it does not mean that both players are in a state of immobility. In a sequential game, this equilibrium is reached in the continuous actions and reactions of the players. Nash equilibrium also does not

mean that the two players have reached an overall optimal state. It should be noted that the optimal strategy does not necessarily reach Nash equilibrium, and a strictly dominated strategy can't be the best response, it is possible to reach a Nash equilibrium with weak-advantage and weak-disadvantage strategies. There may be more than one Nash equilibrium in a game, but there is only one Nash equilibrium in the prisoner's dilemma.

Based on the above hypothesis, local government A and local government B have two opportunities to choose whether to transfer and continue the basic medical insurance relationship of the floating population, the final benefits of both sides are the sum of their respective benefits in the two games [12]. In the game, both sides will take the strategy of maximizing benefits.

In essence, the concept of Nash equilibrium is a win-win concept. The concept of win-win refers to the idea that negotiators seek cooperation to achieve win-win results based on equality and mutual benefit, the core of the idea is to emphasize the unity of interests and common victory.

### 4.3 Protect Rights and Interests with Reasonable Pressure

In business negotiations, the party in control of the initiative to negotiate the final success of the negotiation is more likely. Offensive strategy is one of the common tactics to gain the initiative in business negotiation. The offensive strategy means that the negotiators express their strong stance through words or actions, to gain the necessary respect of the other side, and to exert psychological pressure on the other side so that the other side in the negotiation process to take the initiative, take control of the negotiations. The negotiator should first consider the offensive strategy, forcing the other side to make greater concessions. However, the use of an offensive strategy to be very careful must grasp the negotiation situation, both to seize the weakness of the opponent, and not to be too aggressive.

At a time when the Japanese semiconductor industry is booming, the American Semiconductor industry association and other chipmakers are demanding government action to protect the industry. The US then issued an invitation for Semiconductor industry talks, which would lead to anti-dumping and other retaliatory measures if they failed [13]. Based on the unity of interests, the United States has formulated a package of negotiation conditions, which can be seen that American interest groups are taking a cooperative game.

First, the US could resort to reputation-crushing tactics, bringing dumping cases against Japanese chipmakers for dumping semiconductors in the US market at the same time as negotiations with Japan. The real aim is not to punish the dumping of Japanese semiconductors but to force Japan to make concessions and accept negotiated terms to ease market access standards. This is a common method of pressure in business negotiations.

Then, the United States can use the ultimatum strategy, the strategy used in the middle and late negotiations, clear the final conditions of negotiations, and set a deadline. If the other party does not accept or exceeds the time limit, the negotiations will be terminated.

In business negotiation, the party who wants to gain the initiative in negotiation will often attack the other party, forcing the other party to make maximum concessions and maximize their interests. But in the use of offensive strategy, to unify one side's interests, for the launch of business negotiations to do a full offensive. In the use of offensive strategy, follow the principles of rational, beneficial, and measured.

## 5 Conclusion

Based on the perspective of business negotiation, this paper studies the classification of business negotiation and its important role for enterprises. However, due to Information asymmetry problems and mutual distrust, the cooperation between the two sides is unstable, companies often choose to betray each other. For this, the prisoner's dilemma of the game theory model can be well explained. Therefore, in business negotiations to determine interests to maximize the strategic choice is, as far as possible to use negotiation language to persuade the other side to choose interests. Based on the analysis of this paper, three methods and suggestions based on different perspectives of negotiation can be applied to business negotiation. The two sides reached a Nash equilibrium is a win-win strategy, in a weak position can try to delay the negotiations, as a strong side can pressure the weak side.

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