

Research on Strategic Alliance Conflict Issues Based on the GMCR Model

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Abstract. With the rapid advancement of global economic integration and technology, strategic alliances have become an essential means for multinational enterprises to swiftly enter foreign markets and implement globalization strategies. Conflicts among alliance partners significantly impact the stability of alliances and the profitability of enterprises. This study examines the effects of conflict on alliance stability from the perspectives of the causes of conflict and the categorization of conflicts. Furthermore, it employs the Graph Model for Conflict Resolution (GMCR) to model alliance conflicts, paving the way for new approaches to investigating conflict issues within strategic alliances.

Keywords: Strategic alliances, alliance conflict, GMCR model, conflict research.

1. Introduction

Strategic alliances, as a critical operational strategy for multinational corporations, possess notable advantages such as speed, complementarity, low cost, high efficiency, and ease of implementation. With the development of economic globalization and regional economic integration, an increasing number of multinational corporations are establishing strategic alliances with partners to expand their overseas business while achieving resource and technology complementarities to enhance their international competitiveness.

1.1. Research Background

At present, domestic and international scholars primarily focus their research on strategic alliances in two areas: the factors influencing alliance formation and alliance governance. The key factors affecting alliance formation can be summarized into four points. First, knowledge acquisition: the primary motivation for participating in alliance activities is to gain knowledge and technology from partners that can enhance one's international competitiveness (Glaister, 1996). Second, fairness in the alliance process: managing cross-organizational groups requires fairness to foster collaboration and organizational identity between independent organizations, reduce the risks of conflict and technology exchange, and thereby promote alliance stability (Luo, 2008). Third, managerial behavior: joining alliances is often regarded as a decision made by managers (Cavazos, 2013). Fourth, economic, political, and cultural differences: such differences among alliance members increase the risks associated with alliance construction.

Alliance governance primarily pertains to the organizational management phase following alliance formation. There are three forms of alliance governance: equity ownership, contracts, and self-supervision. Their respective roles are to reduce opportunistic behavior, clarify the responsibilities of each party, and lower transaction costs. Furthermore, Yang Zhenyu and Bai Chunye (2018), using factor analysis and hierarchical regression models, studied trust, conflict, and alliance stability in technology strategic alliances. Their findings indicated that alliance trust and communication serve as a full mediator between alliance conflict and alliance stability. Alliance trust and communication

positively influence alliance stability, while alliance conflict generally has a negative impact on alliance trust and communication.

Strategic alliances are defined as long-term or short-term cooperative relationships between two or more independent organizations to achieve their respective strategic goals. Each party has clear strategic intentions and objectives, which inherently means that the relationship between alliance partners is both collaborative and competitive. Nominally, the parties in a strategic alliance are in a cooperative partnership, but as independent corporate entities with their respective business objectives, they also engage in a game-theoretic relationship. Particularly in horizontal alliances, where both parties operate in the same industry, alliance partners may collaborate in certain areas but maintain managerial independence outside the agreed-upon domains, potentially positioning them as competitors.

This study focuses on the conflicts within strategic alliances. Currently, research on strategic alliance conflicts predominantly adopts case-based empirical studies to explore conflicts among alliance partners. However, this methodological approach is relatively narrow and limited. Case-based empirical research relies on collected cases and data to explain and construct theories, meaning that the validity of conclusions is constrained by the representativeness of the cases.

1.2. Overview of GMCR

The Graph Model for Conflict Resolution (GMCR) is a decision analysis method developed to model, represent, analyze, and study conflict behaviors based on classical game theory and metagame theory. Compared to traditional game theory, GMCR requires less information about the preferences of decision-makers to derive equilibrium solutions for conflict issues, while offering more diverse characterizations of decision-maker behavior. Initially applied to resource conflict scenarios, GMCR has since been widely used in areas such as military conflicts and international trade negotiations. Wang Lingyun and Su Xiaoying (2021) were the first to apply it to the study of conflicts between acquiring firms and host country unions in cross-border mergers and acquisitions.

This demonstrates the broad applicability of the GMCR model in analyzing conflict issues. Accordingly, this paper employs GMCR as the primary methodology to investigate conflicts within strategic alliances. First, the study summarizes and analyzes conflict issues within strategic alliances, identifying the decision-makers and their strategies involved in the conflicts. Then, feasible states are determined based on the decision-makers and their strategies, and a state transition diagram is drawn. Subsequently, the preference rankings of each decision-maker are established, and finally, global equilibrium solutions are obtained for stability analysis and post-stability analysis.

The structure of this paper is organized as follows: Section 2 introduces the concept and types of strategic alliances and uses a literature review method to summarize and generalize potential conflicts within strategic alliances as foundational information for conflict modeling. Section 3 constructs the GMCR model based on the collected information. Section 4 analyzes the stability and post-stability of conflicts and provides policy recommendations for conflict resolution. Finally, Section 5 concludes the study.

2. Research on Strategic Alliance Conflict Issues

The emergence of strategic alliances among enterprises is by no means coincidental but rather a product of the times. The reasons can be summarized into the following two points:

First, the rapid development of science and technology. Over the past fifty years, the pace of scientific and technological progress has surpassed any previous period in history, and the impact brought about by this technological revolution is unprecedented. Research breakthroughs have continuously driven products toward greater technological sophistication and complexity. The development of a new product often involves an increasing number of technical fields and production and operational processes. Therefore, from both technical and cost perspectives, individual companies relying on their own limited resources cannot meet the demands of modern technological

advancements. Strategic alliances, on the other hand, connect various research institutions and enterprises, forming flexible, hierarchical networks aimed at achieving common strategic goals. This model delivers value greater than the sum of its parts.

Second, global economic integration provides multinational corporations with significant opportunities. The objective of multinational corporations in pursuing international strategies is to enhance their international competitiveness, thereby capturing more market share and reaping greater benefits. Achieving this goal inevitably requires improving their technological capabilities and innovative capacities.

Strategic alliances offer multinational corporations effective tools and methods for strategic adjustments, equipping them with competitive weapons to succeed in the global market.

2.1. Definition and Types of Strategic Alliances

Due to the flexibility and diversity of strategic alliances, scholars have provided various definitions for the concept. Williamson, a representative of transaction cost economics, defines a strategic alliance as a partnership between two or more relatively independent organizations pursuing certain activities or processes. Gulati considers alliances as purposive relationships between independent firms that exchange, share, or jointly develop resources or capabilities to achieve mutual benefits. Thompson and others describe alliances as a third tool for coordinating socio-economic activities, distinct from markets and hierarchical management systems. Porter defines strategic alliances as long-term agreements between companies that go beyond normal transactions but fall short of mergers. Synthesizing these classic descriptions, strategic alliances can be defined as "long-term or short-term cooperative relationships between two or more independent organizations to achieve their respective strategic goals." These collaborations are actions taken by firms to meet survival or long-term development needs and are characterized by clear strategic intentions and objectives. However, the cooperative relationship itself may not always be long-term or stable.

Currently, networks and organizations have become trends in corporate development. Network theory suggests that firms with network-based structures significantly enhance organizational vitality and create value chains among enterprises. Strategic alliances embody the characteristics of network-based organizational structures. Their establishment expands the boundaries of resource utilization, improving resource efficiency and reducing sunk costs on the one hand, while saving on new investments in acquiring resources and lowering switching costs on the other. This reduces entry and exit barriers for firms and increases flexibility in strategic adjustments.

Strategic alliances can be categorized based on governance structures into equity alliances (joint ventures, mutual shareholding) and contractual alliances (focused on production, research and development, or sales). From a value chain perspective, they can be classified as horizontal alliances, vertical alliances, or mixed alliances. Based on the degree of formalization, they can be divided into tangible alliances and virtual alliances. Strategic alliances exhibit flexibility and diversity in their formation, and the main forms include:

1. **Joint Ventures:** Established when two or more firms jointly invest and share risks and returns.
2. **R&D Agreements:** Signed by alliance parties to collaboratively develop new products or technologies, reducing development costs and risks.
3. **OEM Production:** Formed when one party possesses a well-known brand but lacks sufficient production capacity, while the other has surplus capacity. This creates a complementary alliance that efficiently utilizes idle resources while mitigating risks associated with investment or acquisition.
4. **Franchising:** A strategic alliance formed through franchise agreements.
5. **Mutual Shareholding:** Alliance parties hold a certain number of each other's shares to strengthen their mutual connection.

Strategic alliances are characterized by blurred boundaries, loose relationships, flexibility, and high efficiency. They provide enterprises with a convenient and low-cost way to rapidly enter host-

country markets and enhance international competitiveness. However, the formation and operation of alliances are often influenced by issues such as market environment, organizational structures, alliance objectives, intellectual property rights, and corporate culture. These factors can even lead to alliance failures. Most of these issues are related to conflicts of interest between alliance parties, such as disputes over control rights before and after alliance formation, conflicts in production methods and efficiencies, and intellectual property disputes under R&D agreements. This study primarily focuses on conflicts that arise after alliances are formed.

2.2. Conflict Issues in Strategic Alliances

Throughout their formation, development, and stabilization phases, strategic alliances face numerous conflicts. This is because strategic alliances are fundamentally partnerships involving the exchange and sharing of resources among multiple entities, established through formal or informal agreements. Consequently, during long-term exchanges, alliance partners may experience conflicts stemming from issues such as unequal distribution of benefits or cultural differences. These conflict issues contribute to the instability and risks of strategic alliances.

A survey conducted by foreign scholars on 880 strategic alliances revealed that only 40% of alliances lasted more than four years, and merely 15% extended beyond ten years. Alliance conflicts not only reduce the profitability of both parties but also lead to the dissolution of alliances. Therefore, in today's globally complex and ever-changing environment, research on conflict issues within strategic alliances has become increasingly urgent and significant.

2.2.1. Causes of Conflict

There are numerous causes of alliance conflicts. In their research on cultural conflicts in international strategic alliances, Jin Yi et al. pointed out that international strategic alliances, being cross-border collaborations, face more management challenges, among which cultural conflicts are the most prominent. Chen Zhenhong et al., in their study on conflict management among alliance partners, categorized the causes of alliance conflicts into six aspects:

1. Mutual dependence among alliance partners
2. Divergence in alliance goals among partners
3. Differences in information and perception among partners
4. Lack of effective communication among partners
5. Cultural differences among enterprises
6. Unreasonable evaluation and compensation mechanisms for alliance contributions

Yang Zhenyu et al. (2004), in their study on the stability of cross-border technology strategic alliances, observed that when certain partners in cross-border alliances acquire sufficient knowledge and technology, their dependence on other partners decreases, which in turn exacerbates alliance instability. Based on case studies and prior research contributions, the primary causes of conflict in strategic alliances can be summarized into the following six aspects:

1. Disputes over control rights in the alliance

Control rights often signify a dominant position within the alliance, enabling the holder to gain more profits and control over resource allocation. This is especially the case for American companies, which, according to studies, are more concerned than their Asian and European counterparts about losing control in alliances. A notable example is the strategic alliance between General Motors and South Korea's Daewoo Group.

2. Cultural differences among enterprises

According to Hofstede's cultural dimensions theory, differences in values, beliefs, and behavioral patterns exist between countries and cultures. These differences are reflected across five dimensions: power distance, individualism versus collectivism, uncertainty avoidance, masculinity versus femininity, and short-term versus long-term orientation. Since strategic alliances often involve enterprises from multiple countries, cultural differences are inevitable, and the greater these differences, the higher the risk of conflict.

3. Issues related to technology transfer

With the rapid advancement of technology, technological capabilities and innovation have become key tools for enhancing international competitiveness. Cross-border technology strategic alliances are becoming increasingly common. If one alliance partner excessively withholds advanced technology and refuses to share it, it may lead to a trust crisis. Conversely, when a partner acquires sufficient technology and knowledge, their dependence on the alliance decreases, potentially destabilizing the alliance.

4. Unequal distribution of benefits

Unequal benefit distribution often occurs after an alliance achieves certain milestones. This is typically caused by unreasonable evaluation and compensation mechanisms for alliance contributions.

5. Mutual dependence among alliance partners

The foundation of alliances is the mutual possession of resources or advantages that are valuable to the other party, creating complementary benefits. If one party no longer possesses resources needed by the other, the alliance may dissolve. For example, in the strategic alliance between General Motors and Daewoo, protests by South Korean labor unions demanding wage increases led Daewoo to lose its advantage of cheap labor.

6. Lack of effective communication

Communication is a prerequisite for reaching consensus among alliance partners. Effective communication allows partners to understand each other's information, thereby adjusting their behaviors and ensuring more effective and coordinated alliance operations. Conversely, ineffective communication—often caused by the lack of formal communication channels, selective attention to received information, differences in communicator positions, or language barriers—can intensify conflicts within alliances or even lead to their dissolution.

2.2.2. Classification of Conflicts in Strategic Alliances

Classifying conflicts helps to better understand the mechanisms through which conflicts affect alliances, thereby enabling decision-makers to adopt targeted and effective strategies to mitigate and resolve conflicts.

Based on their functional mechanisms, alliance conflicts can be categorized into destructive conflicts and constructive conflicts. Destructive conflicts refer to those that may result in operational dysfunction, deterioration of relationships between alliance partners, reduced alliance efficiency, or even the eventual dissolution of the alliance. In contrast, constructive conflicts offer the following three positive effects:

1. Cohesion Function: Conflicts, disagreements, and struggles can help eliminate differences, coordinate actions, and enhance the sense of belonging among alliance partners.

2. Cognitive Function: By reacting to conflicts and observing disagreements, deeper underlying issues can be identified, providing early warnings for the alliance's healthy operation.

3. Activation Function: Constructive ideas, beliefs, assumptions, and conflicts with existing views, methods, and habits can maintain the vitality of the alliance and promote continuous innovation.

Ross highlighted that alliance conflicts encompass two theoretical dimensions: task conflicts and socio-emotional or interpersonal conflicts. Task conflicts refer to disagreements among team members regarding the nature of alliance goals, the relative importance of goals, critical decisions, key procedures, and appropriate actions to achieve tasks. In contrast, emotional conflicts involve negative emotions among team members, such as anger, distrust, fear, and disappointment.

In general, moderate levels of constructive conflict are beneficial for improving alliance performance, while destructive conflicts, especially emotional conflicts, are detrimental to alliance performance and may even lead to the dissolution of the alliance.

3. Conflict Modeling Based on GMCR

This paper selects the strategic alliance between General Motors (GM) of the United States and Daewoo Group of South Korea as a real-world case for conflict modeling analysis. General Motors and Daewoo formed a strategic alliance in 2002, aiming to jointly develop and produce automobiles while sharing technology and market resources. For GM, the alliance represented an opportunity to leverage the significant cost advantages of South Korea's cheap labor market. For Daewoo, it offered access to GM's advanced engineering expertise and entry into the world's largest automobile market. However, in 2018, due to economic pressures and changes in market demand, GM decided to withdraw from the alliance and sell its stake in Daewoo.

During the alliance, conflicts between the two parties were frequent and manifested in several key areas. First, GM's focus on control rights led to disputes, as it leveraged its technological superiority to suppress Daewoo. GM's management also displayed arrogance toward Daewoo's employees. Second, in terms of technology, GM failed to provide Daewoo with sufficient technical guidance during production, leading to frequent issues with the electronic systems of the cars produced. Third, regarding profit distribution, GM's obstruction of Daewoo's efforts to expand into the Eastern European market significantly harmed Daewoo's interests. Fourth, mutual dependency issues arose, as labor strikes by South Korean unions reduced Daewoo's cost advantage of cheap labor. Coupled with quality issues in Daewoo's car production, GM's reliance on Daewoo decreased. Additionally, cultural differences between East and West contributed to conflicts in management and perceptions of value throughout the alliance. Despite these conflicts, both parties failed to engage in effective communication to resolve their issues.

In this case, the development of conflicts was not abrupt, akin to a sudden flood that immediately destroyed the alliance. Instead, the conflict evolved in two distinct stages, during which neither party took proactive measures to address the issues, ultimately leading to the alliance's failure. To better simulate the process of conflict evolution, a dynamic interactive conflict model was constructed using the GMCR methodology. The technical roadmap is shown in Figure 1.

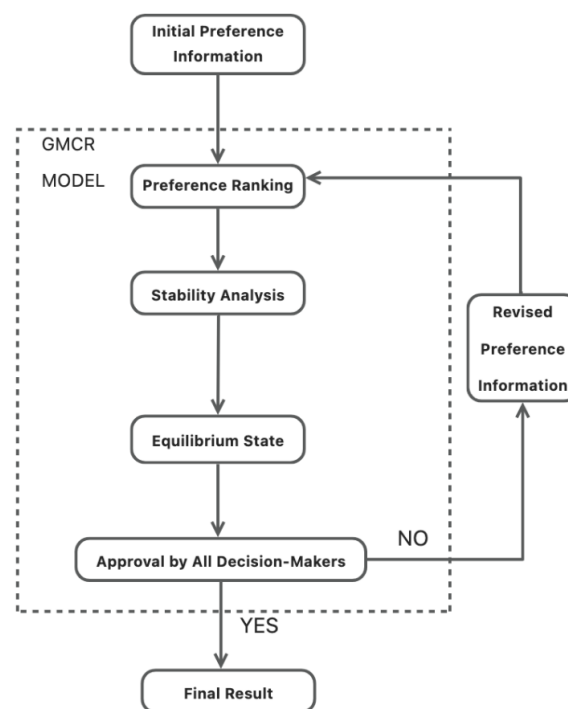


Fig. 1 Technical Roadmap

The GMCR model typically comprises four key elements: A non-empty set of all decision-makers (N): $N\{1, 2, \dots, I, \dots, n\}$; A non-empty set of all feasible states (S): $S = \{s_1, s_2, \dots, s_k, \dots, s_v\}$; A non-empty set of preferences (P) for the decision-makers: $P = \{P_i, i \in N\}$, where P_i defines the state preference rankings for the decision-maker DM_i ; A directed graph of decision-making paths

(G): $G = \{G_i, i \in N\}$, where G_i represents the directed graph of legal transitions between feasible states for DM_i .

In the conflict under study, there are two decision-makers: General Motors (GM), Daewoo Group (DG). Based on the previous analysis, the strategies available to both parties are listed in Table 1.

Table 1. Strategy

Decision-Maker	Strategy
General Motors	O_1 : Strive for control over the alliance O_2 : Engage in effective negotiations
Daewoo Group	O_3 : Persist in exporting automobiles to Eastern Europe O_4 : Improve the quality of automobiles produced O_5 : Terminate the alliance

In the conflict, the states are determined by the strategies adopted by the decision-makers, where "Y" indicates that the strategy is adopted and "N" indicates it is not. In total, the decision-makers have five strategies, which theoretically yield 2^5 possible states. However, some states are not feasible in reality, leaving six feasible states, as shown in Table 2.

Table 2. Feasible States Table

DM	Options	s_1	s_2	s_3	s_4	s_5	s_6
GM	O_1	Y	N	Y	N	Y	N
	O_2	N	Y	N	Y	N	Y
	O_3	Y	Y	N	N	N	N
DG	O_4	N	N	Y	Y	N	N
	O_5	N	N	N	N	Y	Y

In the GMCR model, a decision-maker can only make one move at a time. The relationships between states and the transitions made by decision-makers are represented in a state transition diagram. In the diagram, circular nodes represent feasible states, and directed arrows between states indicate the direction of permissible transitions. Different types of lines correspond to different decision-makers. For instance, in Figure 2, the states s_1 and s_2 are connected by a solid double-headed arrow, indicating that General Motors can transition between s_1 and s_2 with a single strategy change.

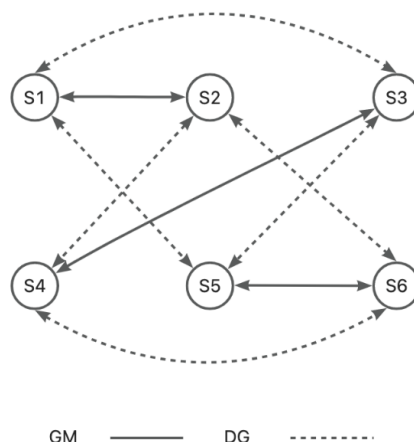


Fig. 2 States Transition Diagram

Decision-makers exhibit varying levels of preference for different states, and acquiring preference information is crucial in the GMCR model as it directly affects the equilibrium solution of the conflict. To accurately simulate the evolution of the conflict, the analysis divides the conflict into two stages. As the stages progress, the decision-makers' preference declarations change, meaning the same decision-maker has different preferences at different stages.

In the early phase of the alliance, General Motors (GM) prioritized control over the alliance, leveraging its technological advantage and cooperative stance to gain the upper hand. On the other hand, Daewoo was highly dissatisfied with GM's obstruction of its efforts to expand into the automotive market, leading to a stalemate between the two parties. In the later phase of the alliance, GM maintained a firm stance on the series of problems that arose, while the worsening quality of Daewoo's production became more evident. Daewoo lost hope for improving the alliance situation and eventually bought GM's 50% stake in Daewoo Motor Company for \$170 million, marking the alliance's conclusion.

This study employs the strategy prioritization method to derive the preference rankings of each decision-maker during the two stages. The initial preference declarations for each party's strategies are shown in Tables 3 and 4, where the strength of preference decreases from top to bottom.

Table 3. Stage 1 Preference Declarations

DM	Preference Declaration
GM	O_1 : GM insists on striving for control of the alliance
	$-O_3 \& O_4$: Does not want Daewoo to expand into Eastern Europe and wishes for improved production quality
	O_2 : Engages in effective negotiations
	O_5 : Terminates the alliance
	O_3 : Persistently expands into the Eastern European market
DG	$-O_1$: Does not want GM to strive for control; prefers equal partnership
	O_2 : Engages in effective negotiations
	O_4 : Improves production quality
	O_5 : Terminates the alliance

Table 4. Stage 2 Preference Declarations

DM	Preference Declaration
GM	O_1 : GM insists on striving for control of the alliance
	$-O_3 \& O_4$: Does not want Daewoo to expand into Eastern Europe and wishes for improved production quality
	O_5 : Terminates the alliance
	O_2 : Engages in effective negotiations
	O_5 : Terminates the alliance
DG	$-O_3$: Persistently expands into the Eastern European market
	$-O_1$: Does not want GM to strive for control; prefers equal partnership
	O_2 : Engages in effective negotiations
	O_4 : Improves production quality

Using the strategy prioritization method, the preference rankings of the decision-makers during the two stages are summarized in Tables 5 and 6.

Table 5. Preference Rankings in Stage 1

DM	Preference Rankings
GM	$s_3 \succcurlyeq s_5 \succcurlyeq s_1 \succcurlyeq s_4 \succcurlyeq s_6 \succcurlyeq s_2$
DG	$s_2 \succcurlyeq s_1 \succcurlyeq s_4 \succcurlyeq s_6 \succcurlyeq s_3 \succcurlyeq s_5$

Table 6. Preference Rankings in Stage 2

DM	Preference Rankings
GM	$s_3 \succcurlyeq s_5 \succcurlyeq s_1 \succcurlyeq s_4 \succcurlyeq s_6 \succcurlyeq s_2$
DG	$s_6 \succcurlyeq s_5 \succcurlyeq s_2 \succcurlyeq s_1 \succcurlyeq s_4 \succcurlyeq s_3$

In this context:

⑩ $>$: Indicates preference. For example, $s_3 >_i s_5$ means DM_i prefers s_3 over s_5 .

⑩ $\sim$: Indicates indifference. For example, $s_3 \sim_i s_5$ means DM_i has no preference between s_3 and s_5 .

At this point, the GMCR model for analyzing the conflict in the strategic alliance has been essentially constructed. In the next section, equilibrium solutions will be derived, followed by stability analysis and post-stability analysis.

4. Stability Analysis

4.1. Stability Definitions

In the GMCR model, when a decision-maker satisfies a particular stability definition and cannot move further, the state they are in is considered a stable state. If all decision-makers in the conflict reach equilibrium in a specific state, this state is referred to as the equilibrium solution of the conflict. The equilibrium states represent potential solutions to the conflict in real-world scenarios.

The most commonly used stability definitions in the GMCR model include Nash Stability (Nash), General Metarationality Stability (GMR), Symmetric Metarationality Stability (SMR), and Sequential Stability (SEQ). The specific definitions are as follows:

Definition 1: If $R_i^+(s) = \Phi$, then DM_i is **Nash** stable at state s .

Definition 2: DM_i is **GMR** stable at state s if and only if, for any $s_1 \in R_i^+(s)$, there exists at least one $s_2 \in R_{N-i}(s_1)$ such that $s \succeq s_2$.

Definition 3: DM_i is **SMR** stable at state s if and only if, for any $s_1 \in R_i^+(s)$, there exists at least one $s_2 \in R_{N-i}(s_1)$ such that $s \succeq s_2$, and for any $s_3 \in R_i(s_2)$, $s \succeq s_3$.

Definition 4: DM_i is **SEQ** stable at state s if and only if, for any $s_1 \in R_i^+(s)$, there exists at least one $s_2 \in R_{N-i}(s_1)$ such that $s \succeq s_2$.

In the definitions:

⑩ $R_i(s)$: Represents the set of all states that decision-maker DM_i can reach from the current state s by making a single strategy change.

⑩ $R_i^+(s)$: Represents the set of all states that decision-maker DM_i can reach from the current state s that are preferable to s .

⑩ $N - i$: Represents the opposing decision-makers to DM_i .

It is important to note that each decision-maker can only make one strategy change at a time, meaning they can move one step per decision.

4.2. Stability Analysis

Based on the previously defined stability criteria, the state transition diagram, and the preference rankings, the stability solutions for the conflict were derived. The results are shown in Tables 7 and 8, where DM_1 and DM_2 represent General Motors and Daewoo, respectively.

Table 7. Stability Results in Stage 1

State	Nash			GMR			SMR			SEQ		
	DM_1	DM_2	E	DM_1	DM_2	E	DM_1	DM_2	E	DM_1	DM_2	E
s_1	√	√	*	√	√	*	√	√	*	√	√	*
s_2		√			√			√			√	
s_3	√			√			√			√		
s_4												
s_5	√			√			√			√		
s_6												

Table 8. Stability Results in Stage 2

State	Nash			GMR			SMR			SEQ		
	DM_1	DM_2	E	DM_1	DM_2	E	DM_1	DM_2	E	DM_1	DM_2	E
s_1	✓			✓			✓			✓		
s_2												
s_3	✓			✓			✓			✓		
s_4												
s_5	✓	✓	*	✓	✓	*	✓	✓	*	✓	✓	*
s_6		✓			✓			✓			✓	

From Tables 7 and 8, it can be observed that the equilibrium states for the two stages are s_1 and s_5 , respectively. In the first stage, the conflict evolves with GM insisting on retaining control over the alliance, leading to strong dissatisfaction from Daewoo, which persistently seeks to expand its automobile business into Europe. In the second stage, GM maintains its strong stance, while Daewoo loses confidence in the alliance and decides to exit. The stability results align perfectly with the real-world situation, demonstrating the feasibility of using the GMCR model to analyze alliance conflict issues.

4.3. Post-Stability Analysis

From the simulation of the two conflict stages mentioned earlier, it is evident that neither Daewoo nor General Motors (GM) engaged in timely and effective communication after conflicts arose. Both parties were unwilling to compromise—GM was unwilling to share power or fairly distribute market benefits, and Daewoo failed to improve the quality of its automobiles in time. Consequently, the destructive conflict could not be transformed into a constructive one, ultimately leading to the dissolution of the alliance.

Next, from the perspective of alliance stability, we examine whether changing the preferences of the decision-makers could improve alliance stability. The revised preference declarations, preference rankings, and stability results are presented from Tables 9 to 11, respectively.

Table 9. Revised Preference Declarations

DM	Revised Preference Declaration
GM	O_2 : Engage in effective negotiations
	O_4 : Hopes that Daewoo improves production quality
	$-O_3$: Does not want Daewoo to expand into the Eastern European market
	O_1 : Strive for control over the alliance
	O_5 : End the alliance
DG	O_4 : Improve production quality
	O_2 : Engage in effective negotiations
	O_3 : Expand into the European market
	$O_5 \text{ if } O_1$: Exit the alliance if GM insists on striving for control

Table 10. Revised Preference Rankings

DM	Preference Rankings
GM	$s_4 \succ s_6 \succ s_2 \succ s_3 \succ s_5 \succ s_1$
DG	$s_4 \succ s_3 \succ s_2 \succ s_6 \succ s_1 \succ s_5$

Table 11. Revised Stability Results

State	Nash			GMR			SMR			SEQ		
	DM_1	DM_2	E	DM_1	DM_2	E	DM_1	DM_2	E	DM_1	DM_2	E
s_1												
s_2	✓			✓			✓			✓		
s_3		✓			✓			✓			✓	
s_4	✓	✓	*	✓	✓	*	✓	✓	*	✓	✓	*
s_5												
s_6	✓			✓			✓			✓		

From Table 11, it can be seen that if GM adopts a more conciliatory approach to negotiations and Daewoo makes efforts to improve automobile production quality, the final equilibrium solution would be s_4 . In this scenario, GM engages in effective negotiations while Daewoo improves automobile production quality. Such an outcome is evidently conducive to the stability of the alliance. Although the concessions by both parties only alleviate internal conflicts and do not guarantee the alliance's success, internal stability is a crucial prerequisite for an alliance's success. This demonstrates that compromise strategies have a significant effect on alliance stability.

5. Conclusion

This study summarizes and analyzes the conflict issues in strategic alliances, discussing their various impacts on alliance stability from the perspective of stability. The key findings are as follows: 1) Practical Application: By applying the GMCR model to model and analyze alliance conflicts, the process of conflict evolution was effectively simulated. This approach allows decision-makers to gain more intuitive insights into conflict dynamics, thereby providing valuable references for decision-making. Furthermore, through post-stability analysis, the stability results of adopting compromise strategies were simulated, demonstrating that compromise strategies significantly contribute to maintaining alliance stability. 2) Theoretical Contribution: The introduction of the GMCR model into the study of alliance conflict issues provides a novel approach to this area of research. Through real-world case studies, the model was proven to accurately simulate alliance conflicts, paving the way for new directions in the study of alliance conflict issues.

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