Research on the Stability of Airline Strategic Alliance Influenced by External Equity Cooperation based on System Dynamics Model

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Abstract

The article employed System Dynamics model as basic analytical framework to make study on the external equity cooperation influences the stability of airline strategic alliance. Combined with the implementation mechanism of the alliance's dynamic stability, the paper analyzed how the equity cooperation made an impact on the stability of airline strategic alliance, ranging from resource dimensions, risk dimensions to social capital dimensions. What's more, the System Dynamics model, relating to the airline strategic alliance stability, has been established. By simulating the model, the paper made study on the stability of airline strategic alliance influenced by external equity cooperation. The simulation results show that the impact of external equity cooperation was closely relevant with the proportion of shareholding, the factor that the willingness of alliance members continued to invest resources in the alliance and the tightness of participating in the cooperation of the alliance.

Keywords: external equity cooperation; airline strategic alliance; stability; system dynamics model

1. Introduction

In order to meet passengers' demands for air transport services, varied sorts of airlines in the world have been seeking strategic partners to form the airline strategic alliance, which would expand the networks to the global scale. Meanwhile, the airline strategic alliance has been the effective method in dealing with bilateral control of international air transport and foreign equity limits of national airlines. Nowadays, the contractual relationships for non-equity alliance was the main content of the three global airline strategic alliance (Star Alliance, SkyTeam Alliance, Oneworld Alliance) whose interior cooperation imposed remarkable effects on the expansion of networks, the growth of traffic, the command of hub airport and the increasing economic benefits for alliance partners. However, in 2014, Etihad Airways established "Etihad Airways Partners" as a link to equity relationship, which incorporated with Air Berlin affiliating with Oneworld Alliance and Alitalia attaching to SkyTeam Alliance. The resurgence of equity cooperation between airline attaching to the alliance and the airline outside of the union has arisen attention of airline strategic alliance. Then, would this form of cooperation influence the operation of alliance stability?

In the theory, regarding the cooperative equity of alliance, much more attention was paid to the alliance governance structure. According to the structure of alliance

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governance, the strategic alliance was divided into the contract alliances and equity alliances (Simonin 1997) [1]. Besides, the strategic alliance was decomposed into contractual agreements, a small amount of equity investments and independently operating joint ventures (Mowla 2012) [2]. Based on the classification of alliance structure, scholars had studied the equity relationship of alliance governance. From the dependence and angle of trust of alliance members, the structure of equity was crucial to avoid opportunistic behaviors (Gulati, Singh 1998) [3]. From investigating the relationship between the hierarchical organizational structure of equity alliance and the protection of core competencies, the alliance could reduce the occurrence of opportunistic behavior by equity relationships and mortgage commitments (Andrej, Klemen 2011) [4]. The joint venture could not effectively deal with relational risk and operational risk, while a minority of equity alliance could effectively deal with opportunistic behavior or manage relational risk (Zheng Shenghua 2001) [5]. The equity cooperation for strategic alliance, regarding equity relationship as a link, would strengthen the trust and responsibility of union parties, which could effectively avoid cooperative risk (Yi Wenhua 2007) [6]. The equity cooperation for strategic alliance highlighted the long-term business cooperation among coalition partners, to some extents, to avoid opportunistic behavior (Zhao Yanlin, Long Yong 2013) [7]. Hence, from literature review, the equity cooperation could strengthen mutual trust between alliance members, reduce the occurrence of opportunistic behavior and effectively avoid relational risks.

Ranging from resource dimension, risk dimension and relational dimension, the literatures relevant to the stability of airline strategic alliance have been investigated by scholars. When it comes to the airline industry, the related research is rare. At the beginning, the instability of strategic alliance was accurately defined, which was the result of cooperative relationship of parties to the transaction and blamed to the imbalance of bargaining power between the partners. What's more, the unplanned targets of alliance, the alternation of union contract and commanding ways as well as the dissolution or merger of union constituted factors for the instability of strategic alliance (Inkpen, Beamish 1997) [8]. For the elements affecting the duration of airline strategic alliance, the complexity of alliance and the amount of members' resources into the union were considered as the main factors from both aspects to forecast the duration of alliance (Rhoades, Lush 1997) [9]. The duration of airline strategic alliance, involving two or more kinds of cooperation, was longer than the one, only involving one class or two, and the depth and breadth of alliance internal cooperation would impose a significant impact on the duration of union (Gudmundsson, Rhoades 2001) [10]. From the point of resource dimension, by the spillover effect and lock-in effect of investment of alliance resources, the investment in specific assets would lead to hold-up problem as well as the proprietary assets or resources corresponding to the overflow problem. Due to these effects that affected the level of resource investment, it would boost the influence of stability of alliance (Cai Jirong 2006) [11]. At the same time, the number and quality of relational assets mirrored the confidence of alliance members for the cooperative relationship and the degree of mutual cooperation, which maintained the self-restraint incentive of alliance relationship in order to enhance the stability of alliance [12]. From risk dimension, inconsistent motivation of alliance internal cooperation, credit risk among alliance members, cultural conflicts within union, uncoordinated management and asymmetric distribution of benefits were considered as five kinds of risks of alliance internal partnership (Wang Hua 2004) [13]. The duration of alliance, specificity of assets, complementarities of resource, mutual trust and mode of monitoring could largely avoid opportunistic behavior, which is conducive to the stability of union (Xu Erming, Zhang Xin 2008) [14]. From the dimension of social capital, the mutual trust, interdependence and resolution of conflicts were treated as essential factors for affecting the stability of alliance (Jiang Xu, Gao shanxing, Li Huan 2009) [15]. The concept of "mutual

interdependence" was originally proposed along with social capitals, both of them were conducive to the achievement of dynamic stability (Xu Libo 2011) [16].

By sorting out the relevant literatures from domestic and foreign scholars, the instability of strategic alliance has been defined. Based on varied theoretical perspectives regarding complexity of union, amount of resources invested by alliance members, depth and breadth of cooperation, risk of collaboration and social relations as factors, the stability of alliance has been studied. However, due to the more single theoretical perspective adopted by scholars and the contradictory conclusions, it should be further considered. In the current studies, the equity cooperation of strategic alliance has merely been seen as a way of coalition governance structure to study the role of equity for the stability and performance of alliance. Until now, no paper is studied from the perspective of equity cooperation.

Therefore, the perspective of external equity would be novel and innovative. And due to the single existing theoretical perspectives, the operation and development of stability of alliance can not be comprehensively analyzed. Ranging from resource dimension, risk dimension to the dimension of social capital, the article is written to study the effect of airline strategic alliance stability influenced by external equity cooperation. Through constructing the system dynamics model relevant to the stability of airline strategic alliance influenced by external equity cooperation and its simulation, the paper makes study on the effect of airline strategic alliance stability influenced by external equity cooperation.

2. Theoretical Fundamentals

2.1. Defining the Concept of Alliance Stability

For the alliance stability, the scholars mainly started it from the perspective of alliance instability. For the operating alliance, the probability of occurrence of instability was from 30% to 50% (Das, Teng 2000) [17]. At the same time, it has been found that the failure rate of strategic alliance was from 24% to 67% (Park, Ungson 2001) [18]. Therefore, the operation of alliance was greatly affected by instability factors.

The scholars studied the alliance stability mainly from two research perspectives: results-oriented and process-oriented (Lv Liejin 2008) [19]. The results-oriented scholars held the judgment of alliance stability was based on the alliance members' evaluations about the results of the operation of the alliance. Namely, the satisfaction with alliance performance and the degree to achieve its objectives reflected the extent to achieve mutual benefit and win-win. On the other hand, the process-oriented scholars held that more attention should be paid to the stability of cooperation among alliance partners. It meant the settlement of contradictions and conflicts, the construction of mutual trust and dependence imposed impacts on the alliance stability, which embodied alliance members in the alliance of interdependent balance. The concept of "interdependent balance" attaching to strategic alliance was originally proposed by one of the domestic scholars who held the dynamic stabilization was the source of the value creation of an alliance and that the dynamic balance of alliance members' interdependence was the fundamental factor to achieve the alliance's dynamic stabilization (Xu Libo 2011) [16]. Regarding the stability of strategic alliance as the dynamic equilibrium of alliance complexity systems, the alliance stability was built on the common understanding of cooperation and the incentive compatibility of equilibrium status among the members (Cai Jirong 2006) [11].

As a consequence, on the basis of present research findings, by building effective and coordinated partnerships within the alliance, the strategic alliance stability is considered to develop the dynamic balance of alliance partners' interdependence, which reflects the quality of alliance interior cooperation and gives expression to the degree of members' satisfaction for the alliance's operation.

2.2. Effects of the Equity Cooperation on Airline Strategic Alliance Stability

Ranging from resource-based theory, resource-dependent theory, transaction costs theory to social capital theory, domestic scholars made study on the strategic alliance stability. By referring to present research achievements, the paper conducted analysis on the effects of the equity cooperation on airline strategic alliance stability from resource dimensions, risk dimensions and dimensions of social capital.

2.2.1. Resource Dimensions: Acquiring critical resources that enterprises needed was the reason of developing strategic alliance. The investment, sharing and integration of resources played an essential role on the operation of strategic alliance. Specifically, the structure of resources could be divided into two types of complementary and scale. Identical or similar resources invested by alliance members was to achieve scale cooperative effect. However, the matched, complementary heterogeneous resources invested by alliance members was to achieve the integration of resources and the synergistic effects (Cheng Guanglin 2012) [20]. The investment of airlines was mainly asset -specific investment and the degree of asset -specific investment was very high. For example, the networks and schedule of hub airports airlines possess had obvious geographical location specificity. Additionally, by professional training and particular knowledge or skills, the employees of airlines would service passengers better. The paper has confirmed that the specific assets and proprietary core resources invested by alliance members were named the input of relational assets whose quantity and quality mirrored the confidence of alliance members for alliance interior cooperation and the degree of trusting partners (Cai Jirong 2012) [12]. What's more, the relational assets invested by alliance members could be regarded as a binding commitment for alliance cooperation, which helps maintaining the sustainable and stable strategic partnership within the alliance.

Equity investment, as specific assets, was considered as an essential source of alliance collaboration, which achieved the integration of cooperative benefits among partners to enhance mutual trust and dependence. Whereas, if this sort of equity cooperation occurred between the alliance member and the airlines outside the alliance, the motivation and enthusiasm investing relational assets into the alliance from alliance members would fade with the increase of equity proportion. Eventually, it leaded to the tightening collaboration between the alliance member and the airline outside the alliance, the weakening dependence for affiliating strategic alliance, the retreat from alliance and the intense motivation of opportunistic behavior. Hence, to avoid the evil impact caused by equity cooperation outside alliance, alliance members should invest the relatively balanced relational assets into the union, which helped developing bilateral dependency between alliance members. Besides, this type of communal relational assets would reflect the confidence of alliance members to the alliance cooperation which effectively promoted the harmonization between members' objectives and behaviors and maintained the balance of negotiation ability of alliance members to form the dynamic balance of interdependence among alliance partners.

2.2.2. Risk Dimensions: The development of air strategic alliance remains a dynamic process. As a result of the uncertainty and complexity of the internal and external environment, there would be many risks for the alliance. The risks could be divided into cooperative risk and operational risk according to the different sources. (Long Yong, Fu Jianwei 2011) [21]. The cooperative risk referred to the situation where alliance members did not fully assume the obligations, which led to the possibility of decreased stability of strategic alliance. The opportunistic behavior of alliance members was its main form. On the other hand, the operational risk meant the possibility of the negative impact on alliance stability that even in the case of absolute cooperation, partners were still unable to complete cooperation objectives. To some extents, the cooperative risk could be well

controlled compared with operational risk. In Consequence, it made sense to study the alliance stability from the perspective of cooperative risk.

The equity cooperation of alliance members would deepen their cooperation with airlines outside alliance. From risk dimension, it brought on the cooperative risk which impeded the openness and transparency of alliance. As a result, alliance members would be unwilling to share information and resources with each other and reduce or even stop the investment of relational assets for alliance, which set limits on the integrated efficiency of interior resources to hinder the cooperative relationship of interdependent balance and win-win. As a result of the existence of equity cooperation outside alliance, alliance members gradually transferred their focus into individual benefit, inducing the opportunistic incentive and behavior which aggravated the alliance interior competition and caused the unbalanced partnership. Simultaneously, alliance members could not reach a consensus on the strategic objective and policy, which weakened the quality of cooperation and was not conducive to form a dynamic equilibrium based on interdependence among alliance partners within an alliance.

2.2.3. Dimensions of Social Capital: According to the dimensions of social capital, social capital existing in the form of networks was an actual or potential resource which existed in the network of personal and social organizations (Pierre Bourdieu 1985; Nahapiet, Ghoshal 1998) [22-23]. It has been believed that social capital remained one kind of resources in the social subjective relationship or the ability to acquire resources. This type of resource or ability majorly stemmed from the mutual trust among subjects (Xu Libo 2011) [11]. Furthermore, some scholars took social capital as research contents of alliance relationship management, holding that mutual trust and commitment played crucial parts for social capital (Mei Hua 2006) [24]. Also, some scholars took commitment, trust and conflict resolution as the content of relationship management (Cai Jirong 2006) [11]. As a consequence, the article took the mutual trust and commitment among alliance members as the major factors of social capital by drawing on the present research fruits. The influence of mutual trust and commitment on the alliance stability in social capital was mainly through the interdependent partner relationship within the union to deepen the cooperation and promote the operation and advancement of alliance stability.

When the equity cooperation occurred between the alliance member and the airline outside the alliance, from social dimensions, it would weaken mutual trust and commitment. On the one hand, alliance members cooperated with airline outside the alliance to seek better benefits of relational assets, which deviated from the alliance interior relationship and could easily give rise to the generation of conflicts among members. On the other hand, this kind of equity cooperation would cripple the importance of the interior teamwork of the alliance and the degree of interdependence among partners. When alliance members communicated and coordinated with each other, it would also increase the barriers. Finally, the alliance members invested personal relational assets into the equity cooperation outside the alliance while using internal resources of the alliance. Therefore, the previous study prove that this kind of equity cooperation would weaken the foundation of mutual trust and commitment and increase conflicts among alliance members to make the interdependence among members deviate from the equilibrium status.

3. The Construction and Simulation of System Dynamics Model

3.1. The Casual Loop Diagram Mode of Airline Strategic Alliance Stability

Ranging from resource-based theory, resource-dependent theory, transaction costs theory to social capital theory, the article had made descriptive analysis on the strategic

stability influenced by equity cooperation outside the alliance. The dynamic stability not only reflected the dynamic equilibrium of interdependence among coalition partners, but also mirrored the degree of satisfaction for operating results of the union from alliance members' point. Hence, when constructing the model, the paper made two modules called "interdependent balance, mutual benefits" and "win-win between alliance members", which were thought to be the common factors of the dynamic stability of strategic alliance.

From the resource dimensions, risk dimensions and dimensions of social capital, the willingness of relational assets to invest, mutual trust and acceptance, the proportion of equity, opportunism behavior were considered as the major influencers of dynamic stability of air strategic alliance in the "interdependent balance" module. From the point of alliance member, the higher the willingness of relational assets to invest for alliance, the more trustworthy the alliance interior cooperation, to enhance the interdependent balance among partners. But, with the growing proportion of equity, there were tightening collaboration between alliance member and airline outside the alliance, which would weaken the base of interdependence among partners.

In the "mutual benefits and win-win" module, the alliance complementary resources, expected benefits, alliances benefits, resource integrated efficiency and conflict of interest were considered as the main factors of the dynamic stability of airline strategic alliance. The heterogeneity and symmetry complementarity resources of alliance, injected by member airline, would boost the integrated efficiency for alliance cooperation and the mutual benefits and win-win during the sharing and integration of resources. At the same time, in the course of alliance cooperation, the achievement of expected benefits of member airline would strengthen the willingness to collaborate, mutual trust and the degree of interdependence and the degree of satisfaction for alliance cooperation from the point of alliance members.

In the casual loop diagram mode of airline strategic alliance stability, the paper set the auxiliary variable, "alliance dynamic stability", as "ADS". In the "interdependent balance" (I) module, the in interdependent balance was taken for the state variable and the time-varying rate variable was named "the enhancement and weakening of mutual interdependent balance". At the same time, the investment of relational assets, mutual trust and commitment, the proportion of equity, opportunism behavior were considered as auxiliary variables. In the module of mutual benefits and win-win (M), the mutual benefits and win-win were regarded as the state variable and the time-varying rate variable was named "the enhancement and weakening of mutual benefits and win-win". Simultaneously, the auxiliary variables were selected from the alliance complementary resources, expected benefits, alliance benefits, the integrated efficiency of resources and conflict of interest. Additionally, for exterior factors affecting the dynamics stability of air strategic alliance, such as government policies, market conditions and other exogenous variables, all of them could be represented by "Time". On the basis of setting variables, adopting the software, Vensim PLE, the paper would draw the casual loop diagram of airline strategic alliance stability influenced by external equity cooperation.
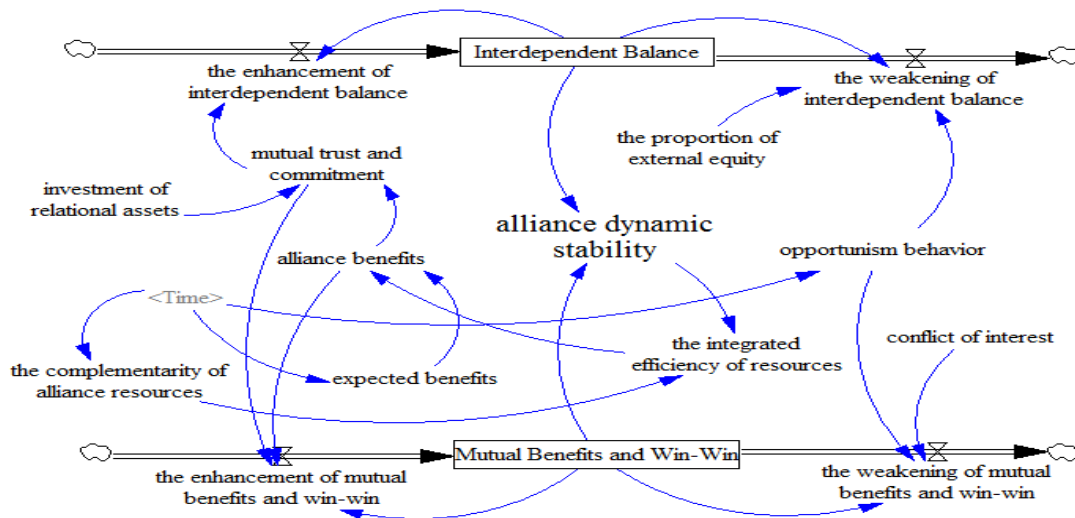
Figure 1. The Casual Loop Diagram Mode of Airline Strategic Alliance Stability Influenced by External Equity Cooperation

3.2. The Simulation of Airline Strategic Alliance Stability Influenced by External Equity Cooperation

3.2.1. The Initial Setting of System Dynamics Model: When the simulation was launched, some parameters could be initially set. Firstly, the value of state variables, "interdependent balance and the mutual benefits and win-win", were set as "10"; for auxiliary variables, due to the fact that the dynamic stability was the results of realizing interdependent balance and the mutual benefits and win-win, therefore, the relationship between dynamic stability and elemental modules could be taken for the relation between inputs and outputs, which could be expressed by the increasing returns to scale function, called "Cobb - Douglas" (Tian Yu 2012) [25]. It is "ADS=$A(t)I^{\alpha}M^{\beta}A(t)Y^{\alpha}L^{\beta}$ (Notes: $\alpha+\beta>1$）" that embodied the effect of increasing returns to scale for two elemental modules, "interdependent balance and the mutual benefits and win-win". For the convenience of calculation, it has been configured that "A(t)=0.7，α=0.6，β=0.5". After that, by this equation, it could reach the initial value of the dynamic stability of strategic alliance. Besides, in the model, concerning inconsistent denominations among variables and lack of real historical data for support, all variables were dimensionless. For some auxiliary variables that could not be described quantitatively, their ranges were belonging to [0,1]. Employing Vensim PLE for the simulation, it could acquire that "INITIAL TIME=0，FINAL TIME=10，TIME STEP=1，SAVERPER=1，Units for Time=Year".

3.2.2. The Validity Test: Before the simulation, the validity test must be applied into the construction of system dynamics model. In general, the correctness of structure was more important than the selection of parameters. The focus of validity test should be stressed on the setting of variables, the causality between variables, the flow graph model and the setting of variable equation.

After that, it could present the trend of interdependent balance, mutual benefits and win-win and dynamic stability of strategic alliance, as shown in the Figure 2. Notably, in the aviation industry, the proportion of external equity injected by foreign companies was strictly restricted, in order to prohibit foreign investors directly or indirectly taking the effective control of national airline. For instance, America, as the most developed aviation industry, published that the foreign equity invested from foreign capital, possessing the right to vote, shall not exceed 25% (Yao Changjin 2014) [26]. Hence, during the construction of model, the initial value of external equity cooperation was set as 25%．
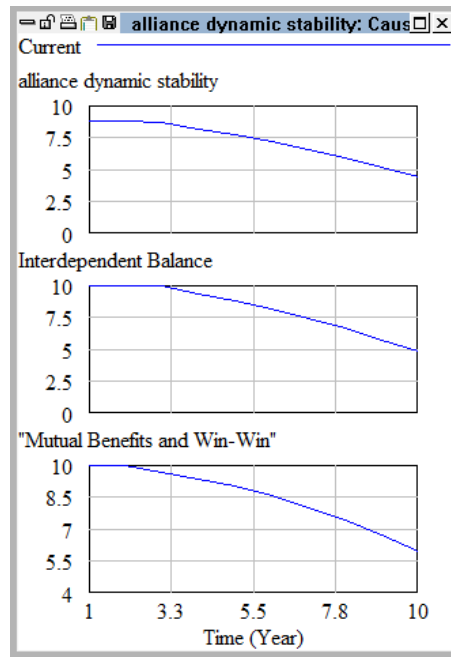
Figure 2. The Trend of Airline Strategic Alliance Stability System

In the Figure 2, the horizontal axis represented time period, while the vertical axis indicated the value changes of factor over a period of 10 years. From the Figure 2, in the background of external equity cooperation for member airline, both the "I" and "M" module continued to decline. Accordingly, the strategic alliance stability also showed a continued downward trend. For the "M" module, during the investigative period of alliance stability, the decrease was relatively tiny, because of the elements of module. The reason why the equity cooperation between alliance member and airline outside the alliance occurred is that this kind of collaboration would bring about much more benefits for alliance member. There would be less expected benefits for the alliance interior cooperation. Therefore, although the benefits of alliance members brought by alliance interior cooperation, it was not notable that the judgment for mutual benefits and win-win from alliance members would not be ruined. For the "I" module, its trend and magnitude kept pace with the alliance dynamic stability, meaning that under the external equity cooperation, the "I" module imposed significant impacts on the alliance. The main reason rested with that the external equity between mutual benefits and win-win contributed to the closer cooperation, which would weaken basis of interdependence among members and make cooperation between members deviate from the interdependent equilibrium, to generate negative effect on the alliance dynamic stability.

By the validity test, the result of simulation would reflect the implementation process relevant to the airline strategic alliance stability influenced by external equity cooperation, be consistent with theoretical expectation of results and more accurately mirror the trend and effects of key factors of the alliance stability. That means that the construction of system dynamics model is effective and reasonable.

3.3.2. The Sensitivity Analysis: Based on the validity test, through the transformation of variable value, the degree of sensitivity of factor changes would be confirmed and the key factors and realization process affecting the alliance dynamic stability would be cleared, in order to take effective control of key factors, deepen cooperation between alliance members and provide theoretical guide for the stabilized operation and development of strategic alliance.
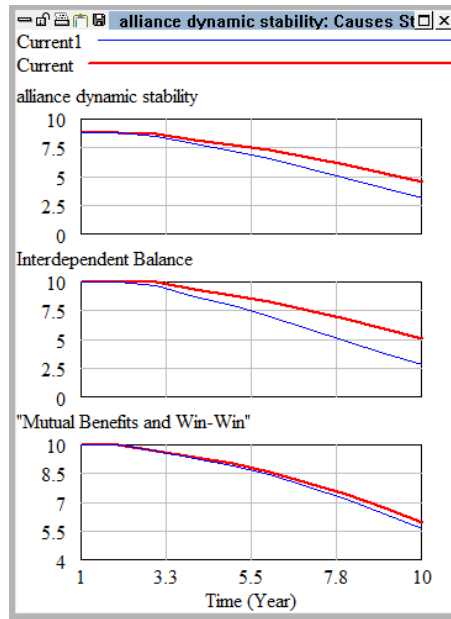
Figure 3. The Trend of Airline Strategic Alliance Stability System under Single Factor Sensitivity Analysis

The Figure 3, was the trend diagram that was gained by the adjustment of single factor of alliance stability system, the proportion of external equity improving to 51%. Specifically, the Current curve represented the initial state of varied curves of alliance stability system. (Notes: the proportion of external equity was 25%). The Current1 meant the state of varied curves when the proportion of equity boosted to 51%. The alliance dynamic stability remained slightly declining after the rising of equity, while the descending trend of "M" module showed minute, but the declining trend of "M" module performed significant. It is the reason that with the deepening of external equity cooperation and the frequent and closer communication between alliance member and airline outside the alliance, the energy of internal cooperation among alliance members has been dispersed and the enthusiasm of participating in internal alliance has been declining, to undermine the interdependence between coalition members. However, the declining trend of alliance dynamic stability remained more gentle than the "I" module, mainly because of the factor that although the proportion of external equity boosted to the level of controlling, alliance members would still be willing to inject relational assets for the alliance and the mutual trust and commitment would remain maintaining. At least, all the alliance members would inject balanced relational assets into the union. Hence, with the growing proportion of external equity, as long as the union members continued to inject relevant relational assets and conduct the integration and sharing of resources, the mutual trust and commitment among members still existed and the benefits for alliance continued to generate. So the rise of equity ratio, caused by single factor, imposed limited impacts on the alliance stability system.
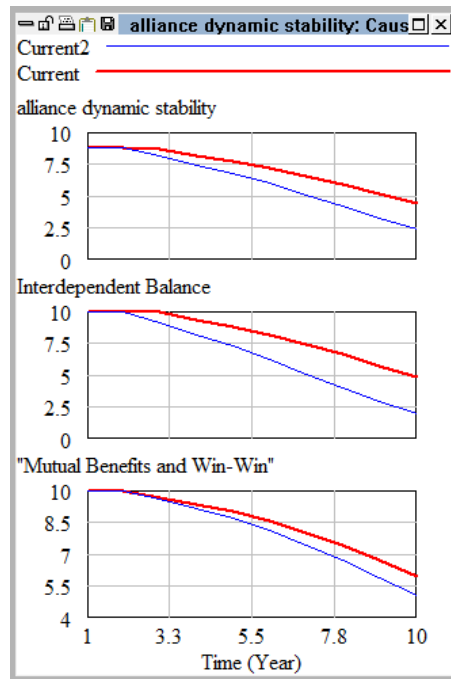
Figure 4. The Trend of Airline Strategic Alliance Stability System Under Multi-Factor Sensitivity Analysis

The Figure 4, was the trend of airline strategic alliance that was gained by the combination of multi-factor sensitivity. Specifically, the Current curve represented the initial state of varied curves for alliance stability system, while the Current2 were taken for the state of varied curves when the proportion of external equity rose by 20%, the ratio of unwillingness to invest relational assets decline by 20% and the opportunism behavior and conflict of interest rose by 20%. In this situation, although the proportion of external equity would rose to 51% that could take control of this companies, the degree of decline for the alliance dynamic stability, "I" module and "M" module was significantly higher than the results of changes caused by single factor. Especially in the "I" module, not only the scope of declining increased, but also the decreasing was ahead of time. It is because the percentage of external equity rose, the enthusiasm for investing relational assets had been ruined and the investment of resources for alliance would be reduced or even stopped, which would undermine mutual trust and commitment among coalition members, increase the potential of conflict and be more difficult to coordinate with members. At the same time, during the period of tightening external equity cooperation, the alliance interior resources were occupied and its own relational assets was invested into the external equity cooperation, leading to the sharing of revenue brought by alliance interior resources and the destruction of basis of mutual benefits and win-win among alliance interior members. Therefore, in this type of system, the dynamic stability was closely associated with the percentage of external equity, the willingness to invest relational assets and the tightness of interior cooperation. Once the allowed alliance members to devote more time and resources to equity cooperation outside the alliance, leaving no time for the union interior collaboration, the negative effect that the alliance dynamic stability was subjected to would be more prominent.

4. Conclusion

From the simulation, the paper has confirmed that the dynamic stability of airline strategic alliance was influenced by multiple factors. The fundamental transformation of stability would be possibly induced by multiple factors, not one factor. In the stability

system of air strategic alliance, under the context of the accession of foreign equity cooperation airlines, the impact for the dynamic stability was related with the ratio of external equity, the willingness of alliance members to invest resources and the tightness of internal cooperation. With the increasing proportion of external equity, alliance members would invest more time and resources to the outside equity cooperation, rather than the internal cooperation of alliance, which would impose a negative impact on the willingness of alliance members and the tightness of internal cooperation. Under the comprehensive effect of multiple factors, the external equity cooperation would pose a significantly negative impact on the dynamics stability of alliance.

Therefore, in order to overcome passive effects, the risk assessment mechanism should be established and improved. For the risks caused by external equity cooperation, it would be brought to the assessment and prevention. For instance, the binding provisions are constructed for cooperative forms and ranges. In the process of equity cooperation, the internal cooperation of alliance members should be deepened and the relational assets should be continually invested into the alliance. Meanwhile, the equity cooperation among alliance members aviation alliance should be encouraged, which would promote more deepened cooperation between members. Besides, the code sharing, frequent flyer program, ground service facilities and IT systems would be considered as the co-marketing revenue. And the joint procurement of aircraft, repairs, training and maintenance services would be taken for cost coordination. From it, more substantial benefits would be delivered to alliance members, thereby reducing the motivation of alliance members to seek outside cooperation. The stable operation and development of alliance would be enhanced by the depth and breadth of internal cooperation.

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