Hindawi
Complexity
Volume 2021, Article ID 8881989, 18 pages
https://doi.org/10.1155/2021/8881989

Research Article

Reverse Knowledge Transfer in Cross-Border Mergers and Acquisitions in the Chinese High-Tech Industry under Government Intervention

Yi Su,[1] **Wen Guo**,[1] **and Zaoli Yang**[2]

[1]*School of Economics and Management, Harbin Engineering University, Harbin 150001, China*
[2]*College of Economics and Management, Beijing University of Technology, Beijing 100124, China*

Correspondence should be addressed to Yi Su; 13527715@qq.com and Zaoli Yang; yangzaoli@bjut.edu.cn

Received 25 September 2020; Revised 12 December 2020; Accepted 21 December 2020; Published 5 January 2021

Academic Editor: Hocine Cherifi

The high-tech industry is the main force promoting the development of China's national economy. As its industrial economic strength grows, China's high-tech industry is increasingly using cross-border mergers and acquisitions (CBM&A) as an important way to "go out." To explore the rules governing the process and operation mechanism of reverse knowledge transfer (RKT) through the CBM&A of China's high-tech industry under government intervention, a tripartite evolutionary game model of the government, the parent company, and the subsidiary as the main subjects is constructed in this paper. The strategies adopted by the three subjects in the RKT game process are analysed, and the factors influencing RKT through CBM&A under government intervention are simulated and analysed using Python 3.7 software. The results show that, under government intervention, the parent company and subsidiary have different degrees of influence on each other. Subsidiaries are highly sensitive to the compensation rate of RKT. Positive intervention by the government tends to foster stable cooperation between the parent company and the subsidiary. However, over time, the government gradually relaxes its intervention in the RKT and innovation of multinational companies.

1. Introduction

Characterized by knowledge-intensive and technology-intensive enterprises, the high-tech industry has adapted to the needs of the fourth industrial revolution and exemplifies the future trend of industrial development. In the wave of R&D globalization, the field of cross-border M&A of Chinese enterprises has gradually entered the deep-water area and gradually emerged from the traditional resource and financial industry to the knowledge-intensive industry with high technology and high added value. Therefore, establishing subsidiaries overseas through cross-border M&A has gradually become an open innovation strategy used by Chinese high-tech enterprises to expand overseas and catch up with technology. Through the "springboard" of CBM&A, China's high-tech enterprises use their competitive advantages to leverage overseas resources and realize the two-way spillover of knowledge and technology to quickly realize the "overtaking on the curve" in terms of science, technology, and international experience and then complete the transformation from traceability to leader [1, 2]. As the main factor of production to promote economic growth, knowledge has become a key resource for the adjustment and upgrading the high-tech industrial structure and improvement in its core competitiveness [3–6]. Therefore, Chinese high-tech enterprises have obvious knowledge searching tendency in the M&A of enterprises in developed countries, and the purpose is to acquire new knowledge resources and transfer knowledge to the parent company. In recent years, China's high-tech enterprises have continued to increase FDI with the goal of technology seeking and can obtain advanced knowledge resources ahead of their competitors from the host country through M&A integration [7, 8], such as Sinopec's acquisition of Addax petroleum and

Lenovo's acquisition of IBM. Such acquisition of knowledge from subsidiaries through CBM&A is called "reverse knowledge transfer" [9]. Unlike the traditional phenomenon of knowledge flowing from the parent company to the foreign subsidiary, RKT is an international strategy that explores new knowledge in the host country and transfers such knowledge to the parent company [10–13]. "Going out" is the only way for developing countries to step forward to developed countries. As support for the "going out" national strategy, CBM&A and the successful integration of knowledge after M&A can improve the innovation performance of the high-tech industry and effectively promote China's economic development. However, owing to the complex and changeable international environment and situation, it has become an urgent task for the Chinese government to give full play to the government's function of guidance and service and create a good external environment for MNCs' overseas M&A and RKT [14]. Although it has been proven by practice that government intervention in MNCs is essential, theoretical guidance regarding practical issues, such as how to improve the efficiency of RKT, how to realize management and control over the RKT process, and the size of the control scale under government intervention, is still lacking. As the successful solution to these problems is related to improvements in the innovation ability and core competitiveness of China's high-tech industry, it is of great practical significance to explore RKT in China's high-tech industry from the perspective of government intervention.

2. Literature Review

A review of previous studies reveals that the key factors affecting RKT have been the focus of scholars' attention and research in recent years [15–17]. The existing literature concerning RKT has made some achievements. Scholars have noticed that the absorptive capacity of the parent company, organizational mechanism, role of the subsidiary company, relationship between the parent company and subsidiary, and knowledge characteristics has an influence on RKT:

(1) The aspect of M&A subjects: the subjects of RKT in CBM&A include the acquirer and the acquired [18]. During the process of RKT, the characteristics, communication ability, transfer frequency, absorptive capacity, and motivation of both subjects of the merger and acquisition affect RKT [19, 20]. Among these factors, regarding M&A, the internal motivation, absorptive capacity, language communication ability, and perception level of the subsidiaries' knowledge resources of the MNCs' parent companies have an important impact on the absorption and utilization of overseas knowledge resources. The lack of internal motivation of the parent company to acquire knowledge resources forms cognitive barriers to RKT [21]. Moreover, the decrease in the parent company's language communication ability and parent company's perception level of the subsidiary's knowledge are also key factors hindering the smooth progress of RKT [22, 23]. In addition, whether the parent company can maintain a good relationship with overseas subsidiaries determines the degree to which the parent company can benefit from RKT [24]. Regarding the acquired party, the age, language communication ability, knowledge or technology dissemination ability, and initiative of the overseas subsidiary can influence the innovation performance of the parent company to a certain extent [25–28]. The subsidiary's location is also a key factor determining the degree of knowledge and resources acquired by the outward investing enterprise. A greater geographical extension for the transnational enterprise is more conducive to feeding the innovation environment of different host countries (regions) back to the parent company to improve its innovation performance [29–31].

(2) The aspect of the transfer environment: the environmental factors of RKT in CBM&A mainly refer to established macrofactors that cannot be controlled by the two sides involved in the CBM&A but could have a certain influence on the process and results of RKT. The factors that influence RKT are focused mainly on the organizational culture, institutional distance, and geographical location [32–34]. Among these factors, although cultural differences lead to conflicts in values, management ideas, and innovation practices between the two sides, if properly addressed, such differences can improve the RKT performance of MNCs [35]. As an important artefact that affects the performance of reverse learning in CBM&A, the institutional differences between the two sides are divided into an institutional surplus and an institutional deficit. An institutional surplus is not conducive to RKT from legalized production-oriented subsidiaries to parent companies, while institutional deficits are conducive to RKT from efficiency-oriented subsidiaries to parent companies [36, 37]. In addition, a combination of organizational factors (such as history, experience, culture, values, and management skills) and/or environments (such as volatility and competition) can affect the ability and willingness of decision makers to take advantage of the unique knowledge and capabilities of different external sources and their market focus. For instance, some subsidiaries operate in highly complex and dynamic industries and national environments, requiring secondary learning by the enterprise to develop dynamic capabilities allowing the enterprise to respond to or shape market disequilibrium [38]. In fast-changing environments with discontinuous changes, the subsidiaries of MNCs that successfully implement ambidextrous activities can best adapt to the changes, thereby contributing to the overall competitiveness of the MNCs [39, 40].

(3) The aspect of transferred knowledge: constituting the basis for MNCs to develop relevant capabilities, knowledge resources are important resources that

MNCs urgently seek by adopting "springboard" behaviour. The attributes of the knowledge resources transferred from subsidiaries to parent companies, such as stickiness, complexity, and obscurity, may affect the transfer of knowledge resources from overseas subsidiaries to their parent companies [41, 42]. Simultaneously, regarding both the parent company and the subsidiary, the knowledge correlation or complementary advantages between the two may also affect the effect and efficiency of the reverse transfer of knowledge resources from the subsidiary to the parent company; that is, the difficulty in transferring knowledge resources with different categories and attributes is different. Some scholars believe that the complementary advantages of knowledge resources are a prerequisite for the success of creative asset seeking CBM&A and that only knowledge resources with complementary advantages can provide impetus for the "springboard" behaviour of domestic MNCs [43]. In addition, some scholars have confirmed the positive correlation between knowledge complexity or knowledge relevance and RKT between parent companies and subsidiaries through enterprise survey data analyses and case analyses and the moderating role of knowledge in the correlation between the parent company's absorptive capacity and RKT [44].

Reviewing and summarizing the research literature concerning RKT in recent years shows that although these studies have made beneficial explorations of RKT in CBM&A, two gaps remain. First, the existing research methods applied to study RKT in MNCs are mainly based on panel data [45], theoretical analyses, or questionnaire surveys [46–48]. Few studies consider the dynamics and regularity of the RKT process of MNCs. Owing to the lack of quantitative research, there are some limitations in specific applications [49–51]. Second, most scholars' research concerning the factors influencing RKT in MNCs remains limited to the internal factors of MNCs. However, as a financial supporter and supervisor of MNCs, the role of the government in the RKT process of MNCs needs to be further discussed. The value of knowledge lies in its flow. The more efficient the RKT in MNCs is, the greater the utility and value of the acquired knowledge is. Compared with other research methods, the evolutionary game model emphasizes the dynamic process of RKT over time. When analysed from a dynamic perspective, the evolutionary process of the participants' group behaviour can be conducive to understanding the nature and contradictions of RKT in MNCs and the changing rules determining how government intervention influences the RKT process.

To compensate for the shortcomings of the above studies and on the basis of relevant research, the government is included in the game as a supporter and regulator of RKT in MNCs in the high-tech industry, and the strategic RKT adoption behaviour of MNCs under government intervention is studied. The main contributions are as follows. First, the evolutionary game model is applied to study RKT in CBM&A. Although the existing literature focuses on the factors influencing RKT, to date, RKT in CBM&A has been discussed by most scholars from a static perspective [52, 53]. In this study, evolutionary game theory is combined with RKT, and the evolutionary mechanism of RKT through CBM&A in China's high-tech industry is revealed from a dynamic perspective, which expands and enriches the research perspective in this field. Second, most studies concerning RKT in MNCs are limited to parent companies and subsidiaries [54–59], and the role of the government has not been considered. Therefore, this study considers the influence of government intervention factors on RKT in MNCs and aims to provide guidance for the specific practice of RKT by MNCs. Overall, this study provides an integrated and holistic research perspective of RKT through CBM&A in China's high-tech industry under government intervention and identifies new potential avenues for future research. Simultaneously, this paper highlights further research needed to promote the development of the relevant literature and provides more specific and actionable guidance for MNCs.

3. Model Assumptions

Although the subject of RKT in CBM&A is the enterprise rather than the government, the government provides necessary help to MNCs by formulating various policies to help them reduce the risk as much as possible in the process of M&A integration. However, there are different supporting policies for CBM&A between developed countries and developing countries. For example, the US gives priority to the protection of CBM&A and promotes CBM&A via domestic legislation, insurance funds, and bilateral agreements. When a bilateral agreement with the host country is signed, double taxation can be avoided, and the tax credit can be exempted while providing tax relief to domestic enterprises invested in countries with bilateral tax treaties; France has long pursued a policy of protection and support for transnational corporations' overseas M&A (financial consolidation and deferred taxation). The central government provides government subsidies and government loans to large MNCs and nonrepayable financial support to small- and medium-sized enterprises; Japan's CBM&A has changed from strict supervision to protection and from foreign exchange control to tax preference (tax concession system and foreign tax credit system) and information technology services. China's State Administration of Taxation and the Ministry of Finance jointly issued a series of preferential tax policies, such as the "Notice on applicable tax rate and tax credit for overseas income of high-tech enterprises," which reduced the tax burden of MNCs. Generally, MNCs in developed countries have stronger autonomy, and their overseas M&A behaviour can have an impact on policy-making institutions. In developing countries, the M&A integration behaviour of MNCs is affected by the policies formulated by the government. Because the autonomy of MNCs is not strong, the role of the government is more important. Compared with that of developed countries, the CBM&A and knowledge integration after M&A in China still face many problems, and the government's help is needed to create better conditions and background to realize smooth RKT in CBM&A. Thus, the government plays a very important role in RKT by providing supervision and incentives. The government can intervene in the RKT of MNCs by formulating preferential policies, providing financial support, and assessing the operational performance of RKT and the completion of tasks by MNCs. On the basis of this, the following assumptions are proposed.

Assumption 1. In the evolutionary game system of an RKT strategy through CBM&A in the high-tech industry, the main participants are the parent company (P), the subsidiary (S), and the government (G). Among the participants, the subsidiary is responsible mainly for transferring personnel with core technologies, management skills, and experience to the parent company or sharing the core technical knowledge and management experience of key personnel with the parent company [60, 61]. The main task of the parent company is to achieve breakthroughs in key technologies and ultimately achieve economies of scale by applying a new technology in a rapidly developing industry by obtaining employees or R&D teams with technical expertise for product innovation. As the motivator and supervisor of RKT in MNCs, the government is responsible mainly for supervising the RKT and innovation activities of MNCs and providing incentives for the knowledge innovation activities of MNCs by formulating preferential policies. These three types of participants are all bounded rational in the game process, and the optimal strategy can be found through repeated games.

Assumption 2. The ability to acquire the knowledge resources of the host country through RKT is a major competitive advantage of MNCs, but RKT is far from a simple internal transaction process [62] and may be affected by multiple factors, such as the disseminative capacity in RKT from subsidiaries to advanced economy headquarters [63], absorptive capacity [64], shared vision [65], subsidiary innovativeness [66], and the geographical and cultural distance between the parent company and its subsidiaries. Both the parent company and the subsidiary are bounded rational; thus, the strategies in which both subjects engage in positive transfer or positive absorption are not always adopted in the RKT game process, and the game strategies of each subject are updated according to those of the other subject. Therefore, it is assumed that, in the evolutionary game system of an RKT strategy through CBM&A in the high-tech industry, one of two strategies, i.e., positive absorption or negative absorption, is then adopted by the parent company; therefore, the strategy set is (positive absorption, negative absorption). Afterwards, one of two strategies, i.e., positive transfer or negative transfer, is then adopted by the subsidiary; therefore, the strategy set is (positive transfer, negative transfer). One of two strategies, i.e., intervention or nonintervention, is then adopted by the government; therefore, the strategy set is (intervention, nonintervention). In addition, the probability that the positive absorption strategy is adopted by the parent company is x; thus, the probability that the negative absorption strategy is adopted by the parent company is $1 - x$. The probability that a positive transfer strategy is adopted by the subsidiary is y; thus, the probability that a negative transfer strategy is adopted by the subsidiary is $1 - y$. Similarly, the probability that the intervention strategy is adopted by the government is z; thus, the probability that the nonintervention strategy is adopted by the government is $1 - z$ and $x, y, z \in [0, 1]$.

Assumption 3. On the basis of transaction cost theory, joint effort is required by the parent company and the subsidiary for an MNC to successfully achieve RKT; for example, the management of RKT by the subsidiary and construction of a reverse transfer mechanism and channels by the parent company are needed. Therefore, c is used to represent the effort cost invested by the parent company and the subsidiary to ensure the smooth progress of RKT. The input of the effort cost is unrelated to the amount of transferred knowledge but represents the price paid by the parent company and the subsidiary jointly to promote RKT, which is a comprehensive reflection of transfer willingness, ability, cognitive impairment, absorption ability, the institutional environment, geographical distance, and other influencing factors. In this paper, a is used to represent the ratio for allocating the effort cost c between the parent company and the subsidiary; thus, the effort cost invested by the parent company is ac, while the effort cost invested by the subsidiary is $(1 - a)c$ and $a \in [0, 1]$. In addition, although the government does not directly participate in the RKT process, reasonable preferential policies are formulated by the government to promote the smooth progress of RKT and knowledge innovation. D is used to represent the reduction in the effort cost of the parent company and the subsidiary due to preferential policies formulated by the government; thus, the effort cost invested by the parent company is $a(c - D)$, and the effort cost invested by the subsidiary is $(1 - a)(c - D)$.

Assumption 4. Successful CBM&A can increase the revenue of MNCs through mechanisms such as cost savings, increased profits, upscaling, and abundant resources as has been demonstrated in different economic sectors [67–69]. Therefore, in the process of RKT, the parent company can obtain not only independent innovation revenue but also additional revenue generated by absorbing the knowledge resources of the subsidiary. R and ΔR are used in this paper to represent the innovation revenue and additional revenue of the parent company, respectively. Knowledge transfer is based on cooperation towards common goals and dialogue encompassing different perspectives [70]; thus, knowledge transfer is affected by the trust level between the parent company and subsidiary; θ is used to represent the level of trust between the subjects. Therefore, the revenue obtained by the parent company is $\Delta R = \lambda\theta k$, where λ represents a discount of the expected additional revenue obtained by the parent company and k represents the value of the knowledge gained through RKT. In the game process, the balance among the value of the knowledge gained by RKT from the subsidiary, the cost required to absorb the knowledge resources, and the compensation to the subsidiary for the RKT needs to be considered by the parent company. In this paper, $w = ek$ is used to represent the compensation of the parent company for the RKT of the subsidiary, where e is the compensation rate. In addition, government intervention in the parent company is mainly reflected in the incentives provided to the parent company through the formulation of tax policies and the assessment of innovation performance. In this paper, r and r' are used to represent the tax rate when the parent company adopts a positive strategy and a negative strategy, respectively $(r < r')$, and the tax base is R. H is used to represent the government's assessment of the parent company, β is used to represent the assessment intensity, and the revenue obtained by the parent company due to the government assessment is $\pm\eta_1\beta H$, where η_1 represents the impact intensity of government assessment on the revenue obtained by the parent company.

Assumption 5. The revenue from the subsidiary's independent innovation before RKT is R_e, and the compensation obtained from the parent company during the RKT process is $w = ek$. To fully mobilize enthusiasm for RKT from the subsidiary, a subsidiary that positively engages in RKT will obtain certain financial support from the government, and G is used to represent such support. In addition, N_1 is used to represent the revenue obtained by the parent company when it adopts the negative strategy and the subsidiary adopts the positive strategy. N_2 is used to represent the revenue of the subsidiary when it adopts the negative strategy and the parent company adopts the positive strategy. The subject who adopts the negative strategy should pay a certain penalty, which is represented by T, to the subject who adopts the positive strategy to avoid opportunistic behaviour in the process of RKT.

Assumption 6. The government not only supports institutional innovation in the RKT of MNCs but also provides external regulation to ensure the smooth progress of RKT. The corresponding governance mechanism will be formulated by the government according to the behaviour of the parent company and the subsidiary in the RKT process but includes mainly formulating preferential policies and implementing supervision strategies. In this paper, c_g is used to represent the cost of the government for formulating relevant preferential policies, and $\eta_2\beta H$ is used to represent the cost of government assessment, where η_2 is the cost coefficient of the government assessment. Simultaneously, an increase in government revenue can be realized by successful RKT and knowledge innovation activities. In this paper, R_g is used to represent the revenue received when the government adopts the intervention strategy and bR_g is used to represent the revenue received when the government adopts the nonintervention strategy. b is used to represent the proportion of the revenue from the government's adoption of a nonintervention strategy to that from the adoption of an intervention strategy and $b \in [0, 1]$.

4. Decision Mechanism of RKT

4.1. Construction of the Payment Function. According to the above assumptions and the principle of profit maximization, the revenue of the parent company, the subsidiary, and the government is analysed, and the payment matrix of the tripartite evolutionary game is constructed, as shown in Table 1.

In the process of a tripartite evolutionary game, when the expectation of a particular strategy adopted by one subject is higher than the average expectation of the mixed strategy, the strategy will be adopted with a higher probability. The replication dynamic equation is the dynamic differential equation used to describe the frequency of the specific strategy adopted by the group [71]. On the basis of the payment matrix of the evolutionary game, the expected revenue when the parent company adopts the positive strategy, the expected revenue when the parent company adopts the negative strategy, and the average expected revenue will be obtained as follows:

$$\begin{aligned} E_p^Y &= yz\left[R + \lambda\theta k + \eta_1\beta H - a(c - D) - e\lambda\theta k - rR\right] \\ &\quad + (1 - y)z\left[R + \eta_1\beta H + T - a(c - D) - rR\right] \\ &\quad + y(1 - z)(R + \lambda\theta k - ac - e\lambda\theta k - rR) \\ &\quad + (1 - y)(1 - z)(R + T - ac - rR), \\ E_p^N &= yz\left(R + N_1 - \eta_1\beta H - T - r'R\right) \\ &\quad + (1 - y)z\left(R - \eta_1\beta H - r'R\right) \\ &\quad + y(1 - z)\left(R + N_1 - r'R - T\right) \\ &\quad + (1 - y)(1 - z)\left(R - r'R\right), \end{aligned} \tag{1}$$

$$\overline{E_P} = xE_p^Y + (1 - x)E_p^N. \tag{2}$$

Similarly, the expected revenue when the subsidiary adopts the positive strategy, the expected revenue when the subsidiary adopts the negative strategy, and the average expected revenue are as follows:

$$\begin{aligned} E_e^Y &= xz\left[R_e + e\lambda\theta k + G - (1 - a)(c - D)\right] \\ &\quad + (1 - x)z\left[R_e + G + T - (1 - a)(c - D)\right] \\ &\quad + x(1 - z)\left[R_e + e\lambda\theta k - (1 - a)c\right] \\ &\quad + (1 - x)(1 - z)\left[R_e + T - (1 - a)c\right], \\ E_e^N &= xz\left(R_e + N_2 - T\right) \\ &\quad + (1 - x)zR_e + x(1 - z)\left(R_e + N_2 - T\right) \\ &\quad + (1 - x)(1 - z)R_e, \\ \overline{E_e} &= yE_e^Y + (1 - y)E_e^N. \end{aligned} \tag{3}$$

The expected revenue when the government adopts the intervention strategy, the expected revenue when the

Table 1: Payment matrix of the evolutionary game of RKT.

S		PT	NT	PT	NT
P	PA	$R+\lambda\theta k+\eta_1\beta H-a(c-D)-e\lambda\theta k-rR$; $R_e+e\lambda\theta k+G-(1-a)(c-D)$; $R_g+rR-G-\eta_2\beta H-c_g$	$R+\eta_1\beta H+T-a(c-D)-rR$; R_e+N_2-T; $R_g+rR-\eta_2\beta H-c_g$	$R+\lambda\theta k-ac-e\lambda\theta k-rR$; $R_e+e\lambda\theta k-(1-a)c$; bR_g+rR	$R+T-ac-rR$; R_e+N_2-T; bR_g+rR
	NA	$R+N_1-\eta_1\beta H-T-r'R$; $R_e+G+T-(1-a)(c-D)$; $R_g+r'R-G-\eta_2\beta H-c_g$	$R-\eta_1\beta H-r'R$; R_e; $R_g+r'R-\eta_2\beta H-c_g$	$R+N_1-r'R-T$; $R_e+T-(1-a)c$; $bR_g+r'R$	$R-r'R$; R_e; $bR_g+r'R$
Gov		YI		NI	

Note: P represents the parent company; S represents the subsidiary; Gov represents the government; PT and NT represent positive transfer and negative transfer, respectively; PA and NA represent positive absorption and negative absorption, respectively; and YI and NI represent intervention and nonintervention, respectively.

government adopts the nonintervention strategy, and the average expected revenue are as follows:

$$\begin{aligned}
E_g^Y &= xy\left(R_g+rR-G-\eta_2\beta H-c_g\right)\\
&\quad + x(1-y)\left(R_g+rR-\eta_2\beta H-c_g\right)\\
&\quad + (1-x)y\left(R_g+r'R-G-\eta_2\beta H-c_g\right)\\
&\quad + (1-x)(1-y)\left(R_g+r'R-\eta_2\beta H-c_g\right),\\
E_g^N &= xy\left(bR_g+rR\right)+x(1-y)\left(bR_g+rR\right)\\
&\quad + (1-x)y\left(bR_g+r'R\right)+(1-x)(1-y)\left(bR_g+r'R\right),\\
\overline{E_g} &= zE_g^Y+(1-z)E_g^N.
\end{aligned} \tag{4}$$

4.2. Solution for the Stability Strategy in the Evolutionary Game. On the basis of the above analysis, the replication dynamic equation of the proportion of the positive strategy adopted by the parent company can be obtained as follows:

$$\begin{aligned}
F(x) &= \frac{\mathrm{d}x}{\mathrm{d}t} = x\left(E_p^Y-\overline{E_p}\right)\\
&= x(1-x)\left[(2\eta_1\beta H+aD)z+(\lambda\theta k-e\lambda\theta k-N_1)y\right.\\
&\quad \left.+T+r'R-rR-ac\right].
\end{aligned} \tag{5}$$

The replication dynamic equation of the proportion of the positive strategy adopted by the subsidiary is as follows:

$$\begin{aligned}
F(y) &= \frac{\mathrm{d}y}{\mathrm{d}t} = y\left(E_e^Y-\overline{E_e}\right)\\
&= y(1-y)\left[(G+(1-a)D)z+\left(e\lambda\theta k-N_2\right)x\right.\\
&\quad \left.+T-(1-a)c\right].
\end{aligned} \tag{6}$$

The replication dynamic equation of the proportion of the intervention strategy adopted by the government is as follows:

$$\begin{aligned}
F(z) &= \frac{\mathrm{d}z}{\mathrm{d}t} = z\left(E_g^Y-\overline{E_g}\right)\\
&= z(1-z)\left(-yG+R_g-bR_g-\eta_2\beta H-c_g\right).
\end{aligned} \tag{7}$$

In the dynamic evolutionary game system, the change in probabilities x, y, and z of strategic adoption by the parent company, subsidiary, and government involved in the game is related to time t, respectively; thus, $x(t), y(t), z(t) \in [0,1]$. Equations (5)–(7) are combined to obtain the replication power system of the parent company, subsidiary, and government, respectively.

According to the requirements of the replication dynamic equation, let $F(x)=0$, $F(y)=0$, and $F(z)=0$, and the local equilibrium points in the game system will be obtained. For P_1 (0, 0, 0), P_2 (0, 0, 1), P_3 (0, 1, 0), P_4 (1, 0, 0), P_5 (0, 1, 1), P_6 (1, 0, 1), P_7 (1, 1, 0), and P_8 (1, 1, 1), the boundary of the evolutionary game solution domain of the RKT comprises the following eight equilibrium points:

$$\left\{(x,y,z) \mid 0\le x\le 1, \mid 0\le y\le 1, \mid 0\le z\le 1\right\}. \tag{8}$$

The dynamic evolution process of the strategy adoption by the tripartite game subjects in the evolutionary game system is described by the differential equation system; thus, the stability of the equilibrium points mentioned above can be judged by a local stability analysis of the Jacobian matrix [72, 73]. According to equation (9), the Jacobian matrix of the system can be obtained as follows:

$$\begin{cases} F(x) = \dfrac{dx}{dt} = x\left(E_p^Y - \overline{E_p}\right) = x(1-x)\left[(2\eta_1\beta H + aD)z + (\lambda\theta k - e\lambda\theta k - N_1)y + T + r'R - rR - ac\right], \\ F(y) = \dfrac{dy}{dt} = y\left(E_e^Y - \overline{E_e}\right) = y(1-y)\left[(G + (1-a)D)z + (e\lambda\theta k - N_2)x + T - (1-a)c\right], \\ F(z) = \dfrac{dz}{dt} = z\left(E_g^Y - \overline{E_g}\right) = z(1-z)\left(-yG + R_g - bR_g - \eta_2\beta H - c_g\right), \end{cases} \tag{9}$$

$$J = \begin{bmatrix} \begin{matrix}(1-2x)\left[(2\eta_1\beta H + aD)z + (\lambda\theta k - \right. \\ \left. e\lambda\theta k - N_1)y + T + r'R - rR - ac\right],\end{matrix} & x(1-x)(\lambda\theta k - e\lambda\theta k - N_1), & x(1-x)(2\eta_1\beta H + aD), \\ y(1-y)(e\lambda\theta k - N_2), & \begin{matrix}(1-2y)\left[(G + (1-a)D)z + \right. \\ \left. (e\lambda\theta k - N_2)x + T - (1-a)c\right],\end{matrix} & y(1-y)\left[G + (1-a)D\right], \\ 0, & z(1-z)(-G), & \begin{matrix}(1-2z)\left(-yG + R_g - \right. \\ \left. bR_g - \eta_2\beta H - c_g\right).\end{matrix} \end{bmatrix}. \tag{10}$$

4.3. Stability Analysis of the Equilibrium Point. According to evolutionary game theory, when a certain equilibrium point satisfies the requirement that all eigenvalues of the Jacobian matrix are nonpositive, that equilibrium point is the evolutionary stable point of the game system. The strategy corresponding to the evolutionary stable point is the evolutionary stable strategy (ESS) [74, 75]. Next, the eight equilibrium points mentioned above are included in the Jacobian matrix one-by-one, and the eigenvalues of the Jacobian matrix corresponding to each equilibrium point can be obtained, as shown in Table 2.

To ensure that the model analysis is consistent with the actual situation, it is assumed that when all subjects in the game system adopt positive or intervention strategies, the revenue is always greater than that when they adopt negative or nonintervention strategies. $T + (1-e)\lambda\theta k + (r' - r)R - N_1 - ac > 0$, $e\lambda\theta k + T - N_2 - (1-a)c > 0$, and $(1-b)R_g - \eta_2\beta H - c_g - G > 0$. Owing to the large number of parameters in the model and its complexity, which lead to uncertainty in the eigenvalue symbols in the Jacobian matrix, different cases need to be discussed (Table 3).

(1) When the subsidiary adopts a negative strategy, the sum of the punishment paid by the subsidiary to the parent company and the tax preference obtained by the parent company due to the incentive policies of the government is greater than the allocated cost paid by the parent company in the case of government intervention. Alternatively, when the parent company adopts a negative strategy, the punishment paid by the parent company to the subsidiary is greater than the allocated cost paid by the subsidiary in the case of government intervention. Thus, when $T + (r' - r)R - ac > 0$ or $T - (1-a)c > 0$, the local stability of each equilibrium point is shown in Table 3. In this case, only the three eigenvalues of the Jacobian matrix corresponding to equilibrium point P_8 (1, 1, 1) are all nonpositive. Therefore, the game system has only one evolutionary stable point, i.e., P_8 (1, 1, 1), and its corresponding ESS is (positive, positive, intervention).

(2) When the subsidiary adopts the positive strategy, the sum of the punishment paid by the parent company to the subsidiary and the financial support the subsidiary obtains is greater than the allocated cost paid by the subsidiary in the case of government intervention. When the parent company adopts the negative strategy, the punishment paid by the parent company to the subsidiary is less than the allocated cost paid by the subsidiary. Alternatively, when the subsidiary adopts a negative strategy, the punishment paid by the subsidiary to the parent company, the tax preference obtained by the parent company due to the incentive policies of the government and the increased revenue due to the assessment of the government are each greater than the allocated cost paid by the parent company in the case of government intervention. When the subsidiary adopts the negative strategy, the sum of the punishment paid by the subsidiary to the parent company and the tax preference obtained by the parent company due to the government's incentive policies is less than the allocated cost paid by the parent company in the case of government intervention. Thus, when $G + T - (1-a)(c-D) > 0$ and $T - (1-a)c < 0$ or when $2\eta_1\beta H + T + (r' - r)R - a(c-D) > 0$ and

Table 2: Eigenvalues of the Jacobian matrix.

Equilibrium point	Eigenvalues of Jacobian matrix J		
	λ_1	λ_2	λ_3
P_1 (0, 0, 0)	$T+(r'-r)R-ac$	$T-(1-a)c$	$(1-b)R_g-\eta_2\beta H-c_g$
P_2 (0, 0, 1)	$2\eta_1\beta H+T+(r'-r)R-a(c-D)$	$G+T-(1-a)(c-D)$	$-[(1-b)R_g-\eta_2\beta H-c_g]$
P_3 (0, 1, 0)	$(1-e)\lambda\theta k+T+(r'-r)R-N_1-ac$	$-[T-(1-a)c]$	$(1-b)R_g-\eta_2\beta H-c_g-G$
P_4 (1, 0, 0)	$-[T+(r'-r)R-ac]$	$e\lambda\theta k+T-N_2-(1-a)c$	$(1-b)R_g-\eta_2\beta H-c_g$
P_5 (0, 1, 1)	$2\eta_1\beta H+T+(1-e)\lambda\theta k+(r'-r)R-N_1-a(c-D)$	$-[G+T-(1-a)(c-D)]$	$-[(1-b)R_g-\eta_2\beta H-c_g-G]$
P_6 (1, 0, 1)	$-[2\eta_1\beta H+T+(r'-r)R-a(c-D)]$	$e\lambda\theta k+G+T-N_2-(1-a)(c-D)$	$-[(1-b)R_g-\eta_2\beta H-c_g]$
P_7 (1, 1, 0)	$-[(1-e)\lambda\theta k+T+(r'-r)R-N_1-ac]$	$-[e\lambda\theta k+T-N_2-(1-a)c]$	$(1-b)R_g-\eta_2\beta H-c_g-G$
P_8 (1, 1, 1)	$-[2\eta_1\beta H+T+(1-e)\lambda\theta k+(r'-r)R-N_1-a(c-D)]$	$-[e\lambda\theta k+G+T-N_2-(1-a)(c-D)]$	$-[(1-b)R_g-\eta_2\beta H-c_g-G]$

Table 3: Local stability of each equilibrium point based on case (1).

Equilibrium point	Eigenvalues of Jacobian matrix J			Stability
	λ_1	λ_2	λ_3	
P_1 (0, 0, 0)	+	+	+	Unstable point
P_2 (0, 0, 1)	+	+	−	Unstable point
P_3 (0, 1, 0)	+	−	+	Unstable point
P_4 (1, 0, 0)	−	+	+	Unstable point
P_5 (0, 1, 1)	+	−	−	Unstable point
P_6 (1, 0, 1)	−	+	−	Unstable point
P_7 (1, 1, 0)	−	−	+	Unstable point
P_8 (1, 1, 1)	−	−	−	ESS

$T + (r' - r)R - ac < 0$, as shown in Table 4, the eigenvalues of the Jacobian matrix corresponding to the equilibrium point P_8 (1, 1, 1) are all nonpositive. Therefore, in this case, the game system has only one evolutionary stable point, i.e., P_8 (1, 1, 1), and its corresponding ESS is (positive, positive, intervention) (Table 4).

(3) When the subsidiary adopts the positive strategy, the sum of the financial support received by the subsidiary and the punishment paid by the parent company to the subsidiary is less than the allocated cost paid by the subsidiary in the case of government intervention. When the subsidiary adopts the negative strategy, the punishment paid by the subsidiary to the parent company, the tax preference obtained by the parent company due to the incentive policies of the government, and the increased revenue due to government assessment are less than the allocated cost paid by the parent company in the case of government intervention. Thus, when $G + T - (1 - a)(c - D) < 0$ and $2\eta_1\beta H + T + (r' - r)R - a(c - D) < 0$, as shown in Table 5, there are two equilibrium points in the game system, and the three eigenvalues of the Jacobian matrix corresponding to each equilibrium point are nonpositive. The two equilibrium points are P_2 (0, 0, 1) and P_8 (1, 1, 1), and the corresponding evolutionary stability strategies are (negative, negative, intervention) and (positive, positive, intervention), respectively.

5. Numerical Simulation

To intuitively observe the dynamic evolution behaviour of the parent company, the subsidiary, and the government in the process of RKT, a numerical simulation is carried out. When the initial value of each parameter in the model is set, the dynamic evolution process of the strategy adoption by the game subjects in different initial states is simulated by using Python 3.7 software. On the basis of the simulation results, the initial willingness of the game subjects, the supervision, and assessment of the government, the preferential policies of the government, and other parameters are discussed.

Table 4: Local stability of each equilibrium point based on case (2).

Equilibrium point	Eigenvalues of Jacobian matrix J			Stability
	λ_1	λ_2	λ_3	
P_1 (0, 0, 0)	−	−	+	Unstable point
P_2 (0, 0, 1)	+	+	−	Unstable point
P_3 (0, 1, 0)	+	+	+	Unstable point
P_4 (1, 0, 0)	+	+	+	Unstable point
P_5 (0, 1, 1)	+	−	−	Unstable point
P_6 (1, 0, 1)	−	+	−	Unstable point
P_7 (1, 1, 0)	−	−	+	Unstable point
P_8 (1, 1, 1)	−	−	−	ESS

Table 5: Local stability of each equilibrium point based on case (3).

Equilibrium point	Eigenvalues of Jacobian matrix J			Stability
	λ_1	λ_2	λ_3	
P_1 (0, 0, 0)	−	−	+	Unstable point
P_2 (0, 0, 1)	−	−	−	ESS
P_3 (0, 1, 0)	+	+	+	Unstable point
P_4 (1, 0, 0)	+	+	+	Unstable point
P_5 (0, 1, 1)	+	+	−	Unstable point
P_6 (1, 0, 1)	+	+	−	Unstable point
P_7 (1, 1, 0)	−	−	+	Unstable point
P_8 (1, 1, 1)	−	−	−	ESS

5.1. Influence of the Initial Willingness of the Game Subjects on Their Strategy Evolution in the Tripartite Game. Assuming that the initial values of the other parameters remain unchanged, the initial willingness of the parent company, subsidiary, and government to choose a positive strategy or intervention strategy is the same; that is, $x = y = z$.

Figure 1 shows the evolution process of the strategies when the tripartite game subjects simultaneously change their initial willingness. As shown in the figure, the critical value of the initial willingness of the tripartite game subjects is between 0.4 and 0.5. When the initial willingness of the tripartite game subjects is less than the critical value, only z gradually converges to 1, while x and y gradually converge to 0. Finally, the equilibrium point of the evolutionary game system tends to P_2 (0, 0, 1), i.e., the stability strategy (negative, negative, intervention). Simultaneously, the willingness of the parent company and the subsidiary to choose the positive strategy converges to 0 at a similar rate. When the initial willingness of the three subjects is greater than the critical value, x, y, and z will converge to 1. Finally, the equilibrium point of the evolutionary game system tends to P_8 (1, 1, 1), that is, the stability strategy (positive, positive, intervention). When the initial willingness of the tripartite game subjects is in the middle level, as the initial willingness of the government to adopt the intervention strategy gradually increases, the rate at which the parent company's and the subsidiary's willingness to adopt the positive strategy converges to 1 gradually accelerates, while the rate at which the government's willingness to adopt the intervention strategy converges to 1 decelerates. According to the above simulation results, as the initial willingness of the tripartite

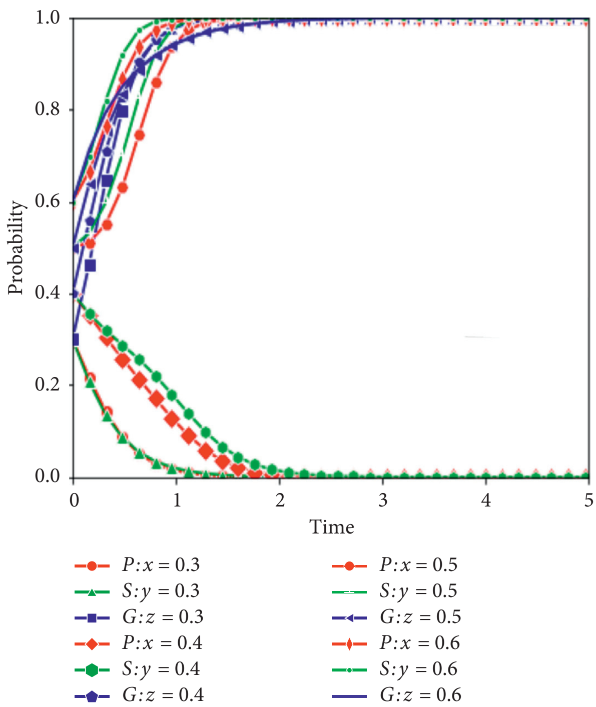

Figure 1: Dynamic evolution process of the tripartite game subjects when x, y, and z change simultaneously.

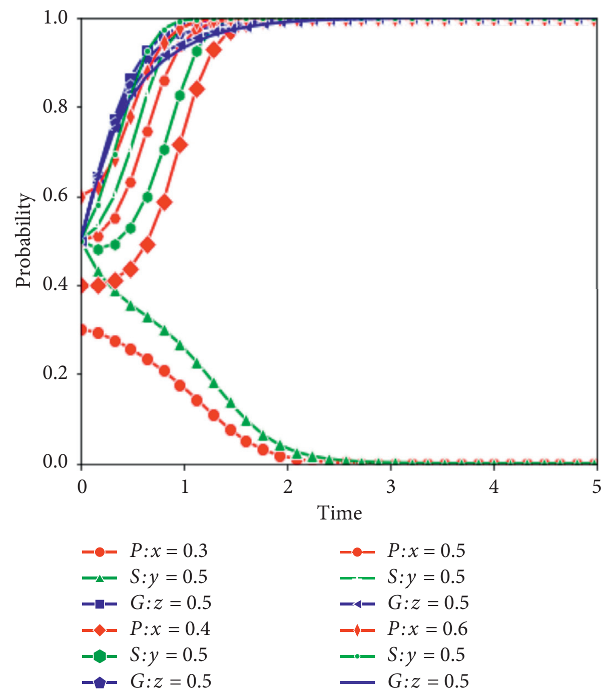

Figure 2: Dynamic evolution process of the tripartite game subjects when x changes.

game subjects gradually increases, the rate at which the parent company's and subsidiary's willingness to adopt positive strategies converges to 1 gradually accelerates. However, the rate at which the government's willingness to adopt the intervention strategy converges to 1 gradually decreases, but ultimately, the three subjects tend to adopt a positive or intervention strategy. In the actual process of RKT, when the willingness of the parent company and subsidiary to engage in RKT is at a low level, the government quickly plays a leading role. Through the formulation of reasonable preferential policies and supervision strategies, the government's guidance of RKT in MNCs will be realized, and the operation mechanism of RKT will be improved [76]. Finally, the efficiency of RKT by MNCs is improved.

Figure 2 shows the evolution process of strategy adoption by the tripartite game subjects in the system when the initial willingness of the parent company to adopt a positive strategy changes under the assumption that the initial values of the other parameters remain unchanged. As shown in the figure, the initial willingness of the subsidiary is the same as that of the government and at a medium level, while the critical value of the initial willingness of the parent company is between 0.3 and 0.4. When the initial willingness of the parent company is less than this critical value, the willingness of the parent company and the subsidiary to adopt the positive strategy gradually converges to 0. However, the convergence rate of the subsidiary is higher than that of the parent company, and the equilibrium point of the evolutionary game system eventually tends to P_2 (0, 0, 1). When the initial willingness of the parent company is greater than its critical value, the willingness of the tripartite game subjects to adopt positive strategies or intervention strategies gradually converges to 1. As the initial willingness of the parent company increases, the willingness of the subsidiary to adopt the positive strategy converges to 1 at a faster rate, while the willingness of the government to adopt the intervention strategy converges to 1 at a slower rate, but the equilibrium point of the evolutionary game system eventually tends to P_8 (1, 1, 1).

Figure 3 shows the evolution process of the strategy adoption by the tripartite game subjects when the initial intention of the subsidiary to adopt a positive strategy changes under the assumption that the initial values of the other parameters remain unchanged. As shown in the figure, the initial willingness of the parent company is the same as that of the government and at a medium level, while the critical value of the initial willingness of the subsidiary is between 0.3 and 0.5. When the initial intention of the subsidiary is less than this critical value, the willingness of the parent company and the subsidiary to adopt the positive strategy gradually converges to 0, and the equilibrium point of the evolutionary game system eventually tends to P_2 (0, 0, 1). At this point, the convergence rate of the parent company is higher than that of the subsidiary, and as the initial willingness of the subsidiary increases, the rate at which the parent company's willingness converges to 0 slows. When the initial willingness of the subsidiary is greater than its critical value, the willingness of the tripartite game subjects to adopt the positive strategy or intervention strategy gradually converges to 1. As the initial willingness of the subsidiary increases, the willingness of the parent company to adopt the positive strategy converges to 1 at a faster rate. The willingness of the government to adopt the intervention strategy converges to 1 at a slower rate, but the equilibrium

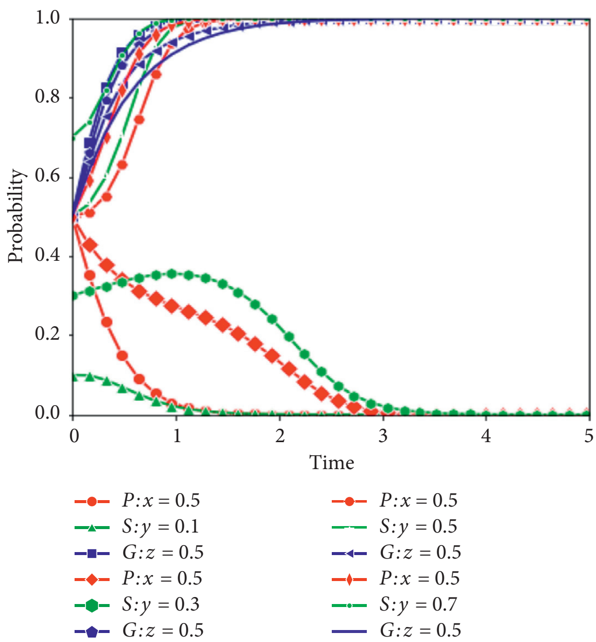

FIGURE 3: Dynamic evolution process of the tripartite game subjects when y changes.

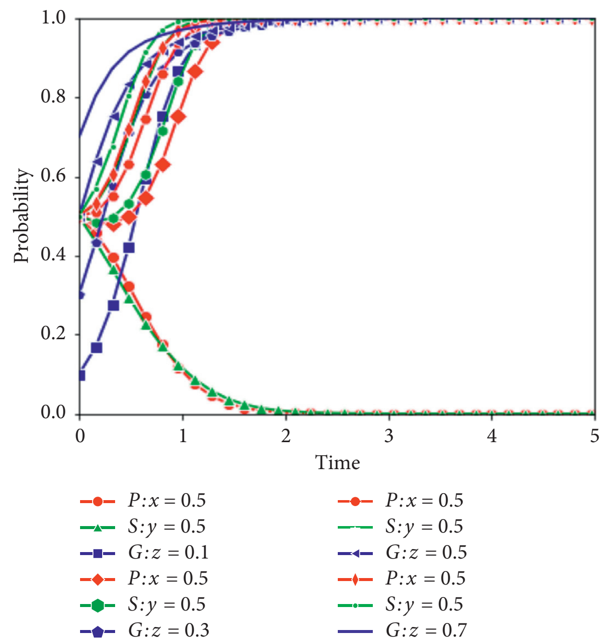

FIGURE 4: Dynamic evolution process of the tripartite game subjects when z changes.

point of the evolutionary game system eventually tends to P_8 (1, 1, 1). The simulation results show that the parent company is greatly influenced by the strategy selection behaviour of the subsidiary. During the actual RKT process, the main task of the subsidiary is to gather and transfer new innovation resources from the host country to the parent company [77–79]. When the subsidiary has a strong desire to engage in this transfer, the parent company's willingness to adopt a positive strategy naturally increases rapidly.

Figure 4 shows the evolution process of the strategy adoption by the tripartite game subjects in the system when the initial willingness of the government to adopt the intervention strategy changes under the assumption that the initial values of the other parameters remain unchanged. As shown in the figure, the initial willingness of the parent company is the same as that of the subsidiary and at a medium level, while the critical value of the initial willingness of the government is between 0.1 and 0.3. When the initial willingness of the government is less than the critical value, the willingness of the parent company and the subsidiary to adopt a positive strategy gradually converges to 0, and the convergence rate of the parent company and the subsidiary is similar; thus, the equilibrium point of the evolutionary game system eventually tends to P_2 (0, 0, 1). At this point, the increase in the willingness of the government to choose an intervention strategy means that the convergence rate of the parent company and its subsidiaries gradually slows. When the initial willingness of the government is greater than the critical value, the willingness of the tripartite game subjects to adopt a positive strategy or intervention strategy gradually converges to 1. As the initial willingness of the government continuously improves, the willingness of the parent company and subsidiary to adopt a positive strategy converges to 1 at a faster rate. The government's willingness to adopt the intervention strategy converges to 1 at a slower rate, but the equilibrium point of the evolutionary game system eventually tends to P_8 (1, 1, 1).

Figure 5 shows the evolution process of the strategy adoption of the tripartite game subjects in the system when the parent company and the subsidiary simultaneously change their initial intention to adopt a positive strategy under the assumption that the initial value of the other parameters remains unchanged. As shown in the figure, the initial willingness of the government is always at a medium level, while the critical value of the initial willingness of the parent company and its subsidiary is between 0.4 and 0.5. When the initial willingness of the parent company and the subsidiary is less than this critical value, their willingness to adopt a positive strategy gradually converges to 0, and the equilibrium point of the evolutionary game system eventually tends to P_2 (0, 0, 1). Simultaneously, as the initial willingness of the parent company and the subsidiary increases, the willingness of both subjects to adopt the positive strategy converges to 0 at a slower rate. The convergence rate of the subsidiary gradually becomes slower than that of the parent company. When the initial willingness of the parent company and the subsidiary is greater than the critical value, the willingness of the tripartite game subjects to adopt the positive strategy or the intervention strategy gradually converges to 1, and the equilibrium point of the evolutionary game system eventually tends to P_8 (1, 1, 1). Simultaneously, as the initial willingness of the parent company and the subsidiary increases, the willingness of the parent company and the subsidiary to adopt the positive strategy converges to 1. The government's willingness to adopt the intervention strategy also converges to 1, albeit at a slower rate.

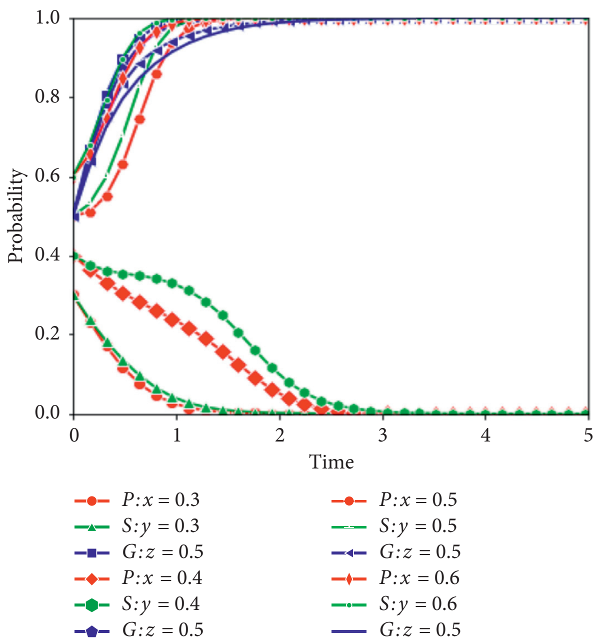

FIGURE 5: Dynamic evolution process of the tripartite game subjects when x and y change simultaneously.

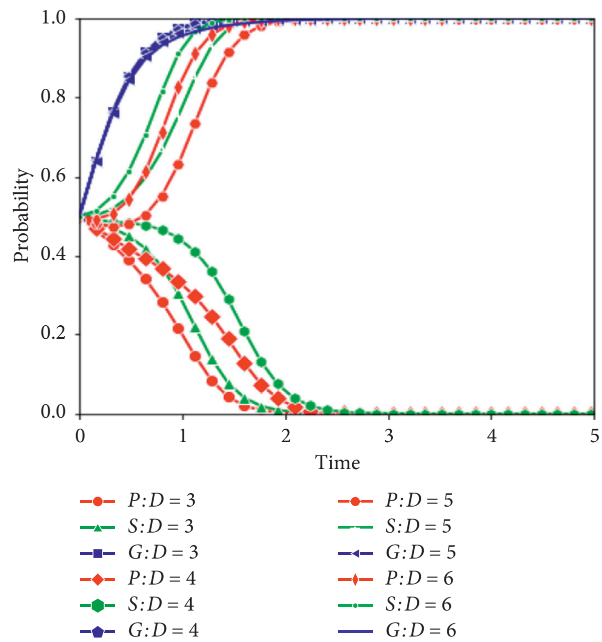

FIGURE 6: Dynamic evolution process of the tripartite game subjects when D changes.

5.2. Influence of Government Intervention Policy on the Strategy Evolution of the Tripartite Game Subjects. The government plays an important role as the supervisor, motivator, and guide of RKT in MNCs in the high-tech industry. Through financial support, guidance management, and policy incentives, the conflicts and barriers between the parent company and the subsidiary can be effectively reduced by the government, and the anticipated and actual cost of RKT for MNCs in the high-tech industry is reduced, encouraging RKT to develop in a healthier direction. The government's intervention policy is reflected mainly in preferential policies conducive to RKT in MNCs and the supervision and assessment of the process and performance of RKT by MNCs. Among them, the role of preferential policies is reflected mainly in the following: ① the formulation of preferential policies reduces the cost of the effort invested in the RKT process by MNCs; ② the government formulates preferential tax policies to provide tax relief to parent companies that adopt a positive strategy; and ③ the government offers financial incentives to subsidiaries that adopt a positive strategy. The government's supervision and assessment are embodied mainly in the supervision and assessment of the performance of the parent company in the RKT process and is considered an important indicator for evaluating the comprehensive strength, social reputation, and social status of MNCs. On the basis of the above discussion, a numerical simulation is carried out to examine relevant parameters, such as reductions in the effort cost, a reduced tax rate for MNCs, financial incentives for subsidiaries that adopt a positive strategy, and the intensity of the government's assessment of the parent company.

Figure 6 shows the evolution process of the strategy adoption of the tripartite game subjects in the system when the preferential policies of the government change due to a reduction in the effort cost under the assumption that the initial values of the other parameters remain unchanged. As shown in the figure, as D (D is the reduction in effort cost) changes, the government always adopts the intervention strategy, while the critical value of D is between 4 and 5. When D is less than the critical value, the willingness of the parent company and the subsidiary to adopt a positive strategy gradually converges to 0, and the equilibrium point of the evolutionary game system eventually tends to P_2 (0, 0, 1). Simultaneously, as D increases, the willingness of the two subjects to adopt a positive strategy converges to 0 at a slower rate. When D is greater than this critical value, the willingness of the parent company and the subsidiary to adopt a positive strategy gradually converges to 1, and the equilibrium point of the evolutionary game system eventually tends to P_8 (1, 1, 1). Simultaneously, as D increases, the willingness of the two subjects to adopt a positive strategy converges to 1 at a faster rate, and the convergence rate of the subsidiary is higher than that of the parent company. Thus, when the government adopts an intervention strategy and the parent company adopts a positive strategy, the subsidiary is more sensitive to the reduction in effort costs during the RKT process. In fact, during the process of RKT by MNCs in high-tech industries, the effort cost can be reduced through preferential policies formulated by the government, such as certain economic subsidies for MNCs. According to the simulation results, the greater the government's economic subsidy for the cost of RKT is, the faster the MNCs will evolve towards the stability strategy. Therefore, economic subsidies can be used as an effective adjustment mechanism to increase the revenue of participants in RKT.

Figure 7 shows the evolution process of the strategy adoption of the tripartite game subjects in the system given that the initial values of the other parameters remain unchanged, while the financial incentives obtained by the

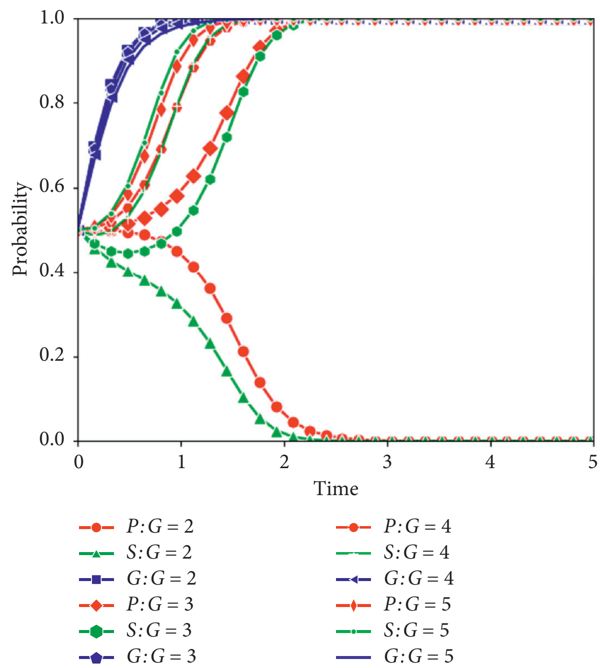

Figure 7: Dynamic evolution process of the tripartite game subjects when G changes.

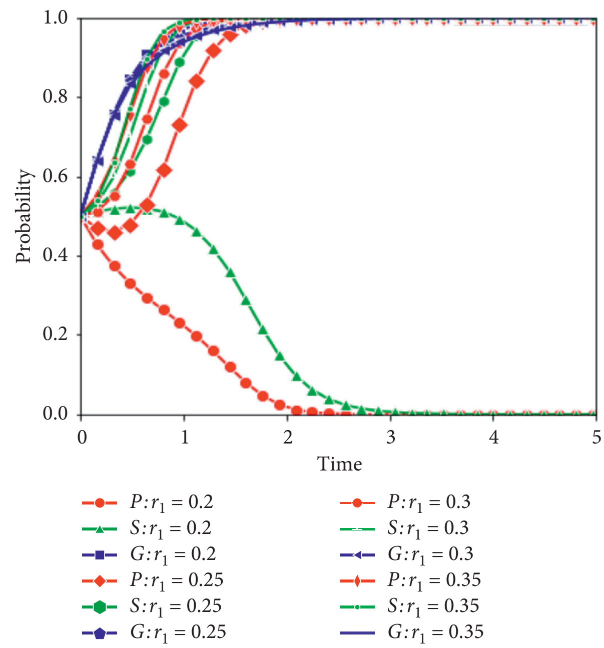

Figure 8: Dynamic evolution process of the tripartite game subjects when r' (r' is replaced by r_1 in the figure) changes.

subsidiary when it adopts the positive strategy change. As shown in the figure, as G (G is the financial revenue obtained by the subsidiary when it adopts an active strategy) changes, the government always adopts the intervention strategy, while the critical value of G is between 2 and 3. When G is less than this critical value, the willingness of the parent company and the subsidiary to adopt a positive strategy gradually converges to 0, and the equilibrium point of the evolutionary game system eventually tends to P_2 (0, 0, 1). When G is greater than this critical value, the willingness of the parent company and the subsidiary to adopt a positive strategy gradually converges to 1, and the equilibrium point of the evolutionary game system eventually tends to P_8 (1, 1, 1). In addition, as shown in Figure 7, the willingness of the parent company and the subsidiary to adopt a positive strategy converges to 0 or 1 at a similar rate regardless of whether G is above or below the critical value. Thus, a change in G has a small impact on the parent company and the subsidiary.

Figure 8 shows the evolution process of the strategy selection of the tripartite game subjects in the system given that the initial values of the other parameters remain unchanged, but the tax rate changes when the parent company adopts the negative strategy. As shown in Figure 8, as r' (r' is the tax rate when the parent company adopts the negative strategy) changes, the government always adopts the intervention strategy, and the critical value of r' is between 0.2 and 0.25. When r' is less than this critical value, the parent company's willingness to adopt a positive strategy gradually converges to 0, while the subsidiary's willingness gradually converges to 0 as the parent company's willingness to adopt a positive strategy decreases, and the equilibrium point of the evolutionary game system eventually tends to P_2 (0, 0, 1). The parent company converges to 0 faster than the subsidiary does, which means that when r' is less than the critical value, the parent company is more sensitive to the tax policies of the government. When r' is greater than the critical value, the willingness of the parent company and the subsidiary to adopt a positive strategy gradually converges to 1, and the equilibrium point of the evolutionary game system eventually tends to P_8 (1, 1, 1). At this point, as r' increases, the willingness of the parent company and the subsidiary to adopt a positive strategy converges to 1 at a faster rate. The simulation results show that the initiative of MNCs to engage in RKT can be encouraged by appropriately increasing taxes. For example, in some developed countries, such as the United States and Japan, the indirect tax incentives and financial science and technology appropriation subsidies implemented by the government are used to ensure the smooth progress of RKT by MNCs according to the actual situation.

Figure 9 shows the evolution process of the strategy adoption of the tripartite game subjects in the system given that the initial values of the other parameters remain unchanged, but the intensity of the government's assessment of the innovation performance of MNCs changes. As shown in the figure, the parent company is encouraged to gradually adopt a positive strategy under the supervision and assessment of the government. Simultaneously, the compensation rate for RKT will be improved by the parent company according to the actual situation, and then, the strategy adoption of the subsidiary is affected, which means that the strategy adoption by the subsidiary evolves in a positive direction. However, over time, the evolution rate does not greatly differ.

5.3. Influence of the Compensation Rate for RKT on the Strategy Evolution of the Tripartite Game Subjects. Figure 10 shows the evolution process of the strategy adoption of the

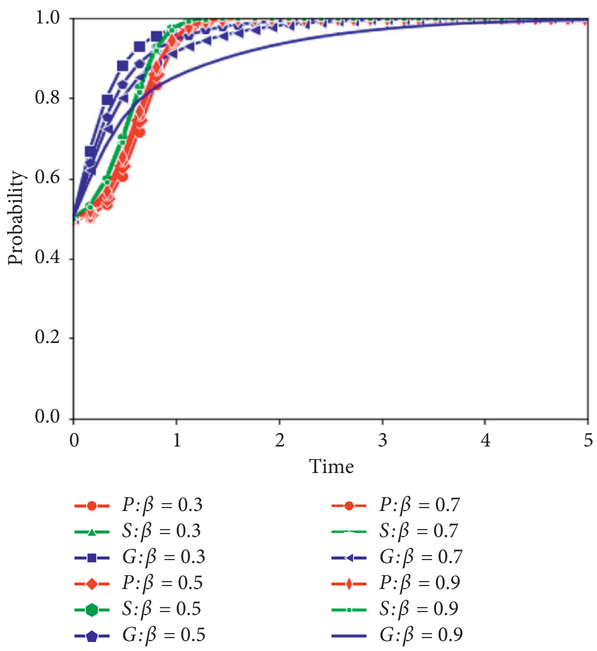

FIGURE 9: Dynamic evolution process of the tripartite game subjects when β changes.

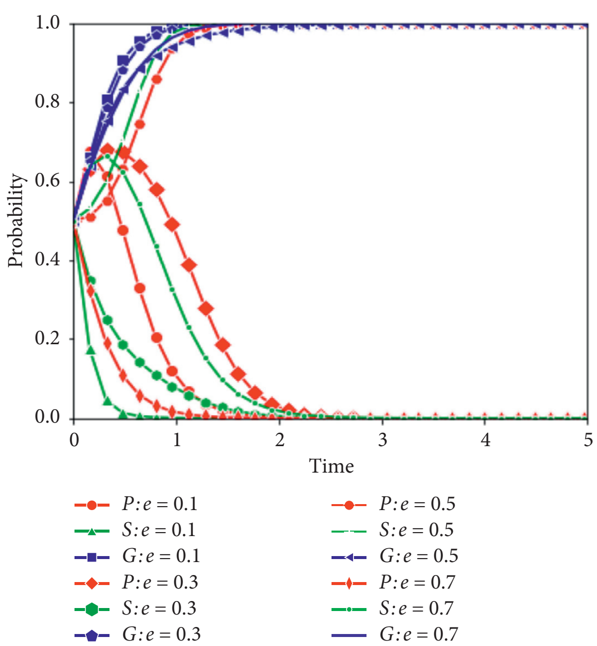

FIGURE 10: Dynamic evolution process of the tripartite game subjects when e changes.

tripartite game subjects in the system when the compensation rate of the parent company for the RKT of its subsidiary changes under the assumption that the initial values of the other parameters remain unchanged. As shown in the figure, as e (e is the compensation rate of the parent company for the RKT of its subsidiary) changes, the government always adopts the intervention strategy. e has two critical values, i.e., between 0.3 and 0.5 and between 0.5 and 0.7, which are denoted as the first critical value and the second critical value, respectively. When e is less than the first critical value, although the parent company's willingness to adopt a positive strategy has a temporary rising trend, as the willingness of the subsidiary rapidly declines, the willingness of the parent company also rapidly declines and gradually converges to 0, and the equilibrium point of the evolutionary game system eventually tends to P_2 (0, 0, 1). At this point, as e increases, the willingness of the parent company and the subsidiary to adopt the positive strategy converges to 0 at a slower rate, and the convergence rate of the subsidiary is higher than that of the parent company. Thus, the subsidiary is more sensitive to the compensation rate. When e is greater than the first critical value but less than the second critical value, the willingness of the parent company and the subsidiary to adopt the positive strategy gradually converges to 1, and the equilibrium point of the evolutionary game system eventually tends to P_8 (1, 1, 1). When e is greater than the second critical value, although the willingness of the subsidiary to adopt the positive strategy has a temporary rising trend, as the willingness of the parent company to adopt the positive strategy rapidly declines, the willingness of the subsidiary also rapidly declines and gradually converges to 0, and the equilibrium point of the evolutionary game system will tend to P_2 (0, 0, 1). At this point, as e increases, the willingness of the parent company and the subsidiary to adopt the positive strategy converges to 0 at a faster rate. The convergence rate of the parent company is higher than that of the subsidiary, which means that the parent company is more sensitive to the compensation rate.

6. Conclusions and Countermeasures

From the perspective of government intervention, a tripartite evolutionary game model of RKT by MNCs under government intervention is established, and the evolution of the decision-making processes of the government, parent company, and subsidiary related to RKT is systematically analysed. Finally, Python 3.7 software is used to analyse the evolution behaviour in the tripartite game among the government, parent company, and subsidiary. The following conclusions can be drawn:

(1) The degree of influence held by the government, the parent company, and the subsidiary over the other subjects varies. ① Under government intervention, the parent company and the subsidiary have similar sensitivities to government intervention policies, and the parent company is more sensitive to the strategic adoption behaviour of its subsidiary. ② Overtime, the cooperation between parent companies and subsidiaries tends to become stable under the positive intervention of the government. At this point, on the basis that the RKT activities of MNCs can proceed smoothly, the intervention of the government in the RKT and innovation of MNCs will be gradually relaxed to guarantee the sustainable and stable development of the knowledge innovation activities of MNCs at a lower cost. ③ Subsidiaries are highly sensitive to the compensation rate for RKT.

The subsidiary's enthusiasm for RKT can be improved through an appropriate compensation rate although a higher or lower compensation rate is not conducive to a smooth RKT process.

(2) As the guides and supervisors of RKT in MNCs, the evolution of parent companies and subsidiaries can be quickly and effectively promoted in the direction of positive cooperation through government intervention, and the RKT strategy of MNCs will be gradually guided to the right track. ① During the process of RKT by MNCs in the high-tech industry, the cost of MNCs' efforts will be reduced by an economic subsidy from the government. The greater the economic subsidy for the effort cost of RKT is, the greater the willingness of the MNCs to actively engage in RKT is. ② The enthusiasm of subsidiaries for RKT will be stimulated if the government provides financial support. ③ The enthusiasm of MNCs for RKT is improved by appropriately increasing the tax from the government. ④ The negative attitude of MNCs regarding RKT is reduced through the supervision and assessment of the government, which will stimulate the enthusiasm of MNCs engaged in continuous RKT.

The conclusions of this study offer certain insights and reference value for the formulation of RKT strategies for CBM&A in China's high-tech industry. RKT in MNCs in the high-tech industry should be guided in a more healthy and efficient direction. First, during the process of RKT through CBM&A in the high-tech industry, the cost of RKT for MNCs will be reduced because of economic subsidies from the government based on financial allocations to support science and technology, and the parent company and subsidiary will become motivated to participate in RKT activities. Simultaneously, the government should increase financial support to subsidiaries to fully mobilize their enthusiasm to transfer knowledge to the parent company. Second, according to the actual situation of RKT, corresponding preferential tax policies can be formulated by the government, and the enthusiasm of MNCs for RKT can be encouraged by appropriately adjusting the tax rate. In fact, the enthusiasm of the parent company for RKT cannot be mobilized by either higher or lower tax rates. Therefore, reasonable tax policies should be formulated by the government according to the innovation performance of the parent company during the RKT process to maximize performance in RKT and innovation. Third, an effective supervision and assessment mechanism should be established by the government. On the basis of the actual situation of RKT in CBM&A, the government needs to form a flexible performance evaluation mechanism to purposefully and logically evaluate MNCs. This mechanism will be used as an "incentive stone" to mobilize enthusiasm for RKT among MNCs. Fourth, the compensation rate for the subsidiary should be flexibly adjusted according to the extent of the subsidiary's participation in RKT to achieve a balance of revenues between the parent company and the subsidiary.

This study provides important contributions to the current scholarly literature. First, the existing literature proposed some new ideas regarding RKT in CBM&A [28, 80, 81], but a formal discussion of the rules through which it evolves under the influence of government intervention and other related factors is lacking. In this study, evolutionary game theory is applied, and the evolution of RKT through CBM&A over time under the influence of government intervention and the changes in its evolution direction are discussed from a dynamic perspective, constituting a new research method for the field of CBM&A and RKT and a reference for high-tech enterprises undertaking or considering CBM&A. Second, in this research field, RKT subjects attracting most scholars' concern are limited to the parent company and the subsidiary [82–85], and the role of the government as the regulator and guide of CBM&A in the process of RKT is neglected. Therefore, the influence of government intervention policies and other related factors on the evolution of RKT strategies based on CBM&A in the high-tech industry is analysed from a new perspective that includes government intervention; this approach not only expands the research perspective of RKT but also enriches the research content concerning government intervention in RKT through CBM&A. Overall, this study helps compensate for the shortage of literature concerning RKT and introduces a new research path to further speculate regarding RKT games in which multiple subsidiaries participate under government intervention.

Several limitations of this study should be noted. Although this study discusses the strategic adoption of RKT in China's high-tech industry under government intervention and some important conclusions are drawn, there are still several deficiencies. First, during the actual process of RKT through CBM&A, when a subsidiary makes a game decision, the game should consider not only the costs incurred by the subsidiary during the RKT process and the compensation of the parent company for the subsidiary's RKT but also the influence of the game strategy of the other subsidiaries supported by the RKT network of MNCs on the subsidiary's game revenue needs. Therefore, the rule of strategy evolution of RKT involving multiple subsidiaries under government intervention can be studied in the future. Second, the simulation parameters in this study are set according to expert opinions rather than actual parameters; thus, the simulation diagram can only reflect the general trend in the strategy adoption behaviour of each subject in the RKT, which also needs to be further studied.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Acknowledgments

This work was supported by the National Natural Science Foundation of China (71774036 and 72074059), Social Science Foundation of Heilongjiang (20GLB120), and Natural Science Foundation of Heilongjiang Province (QC2018088 and LH2020G004).

References

[1] X. M. Wu and Z. W. Su, "Using cross-border mergers and acquisitions as a lever for technological catch-up: a dynamic capability perspective," *Management Word*, no. 4, pp. 146–164, 2014.

[2] J. Wei and Y. Yang, "Bridging the chasm between identities: identities asymmetry and post-acquisition integration strategy," vol. 34, no. 6, pp. 140–156+188, 2018.

[3] C.-C. Huang, Y.-N. Fan, C.-C. Chern, and P.-H. Yen, "Measurement of analytical knowledge-based corporate memory and its application," *Decision Support Systems*, vol. 54, no. 2, pp. 846–857, 2013.

[4] A. R. Montazemi, J. J. Pittaway, H. Qahri Saremi, and Y. Wei, "Factors of stickiness in transfers of know-how between MNC units," *The Journal of Strategic Information Systems*, vol. 21, no. 1, pp. 31–57, 2012.

[5] T. H. Powell and V. Ambrosini, "A pluralistic approach to knowledge management practices: evidence from consultancy companies," *Long Range Planning*, vol. 45, no. 2-3, pp. 209–226, 2012.

[6] M. Kotabe and T. Kothari, "Emerging market multinational companies' evolutionary paths to building a competitive advantage from emerging markets to developed countries," *Journal of World Business*, vol. 51, no. 5, pp. 729–743, 2016.

[7] A. Kumaraswamy, R. Mudambi, H. Saranga, and A. Tripathy, "Catch-up strategies in the indian auto components industry: domestic firms' responses to market liberalization," *Journal of International Business Studies*, vol. 43, no. 4, pp. 368–395, 2012.

[8] Y. Luo and R. L. Tung, "A general theory of springboard MNEs," *Journal of International Business Studies*, vol. 49, no. 2, pp. 129–152, 2017.

[9] C. S. Kogut and R. C. Mello, "Reverse knowledge transfer in multinational companies: a systematic literature review," *Brazilian Administration Review*, vol. 14, no. 1, pp. 1–21, 2017.

[10] L. Chung, "Headquarters' managerial intentionality and reverse transfer of practices," *Management International Review*, vol. 54, no. 2, pp. 225–252, 2014.

[11] N. Kumar, "Managing reverse knowledge flow in multinational corporations," *Journal of Knowledge Management*, vol. 17, no. 5, pp. 695–708, 2013.

[12] M. Mcguinness, M. Demirbag, and S. Bandara, "Towards a multi-perspective model of reverse knowledge transfer in multinational enterprises: a case study of coats plc," *European Management Journal*, vol. 31, no. 2, pp. 179–195, 2013.

[13] S. Michailova and Z. Mustaffa, "Subsidiary knowledge flows in multinational corporations: research accomplishments, gaps, and opportunities," *Journal of World Business*, vol. 47, no. 3, pp. 383–396, 2012.

[14] Y. Su and X. L. An, "Application of threshold regression analysis to study the impact of regional technological innovation level on sustainable development," *Renewable & Sustainable Energy Reviews*, vol. 89, pp. 27–32, 2018.

[15] M. M. Raziq, G. R. G. Benito, P. Toulson, O. F. Malik, and M. Ahmad, "Roles and strategies of foreign MNE subsidiaries in New Zealand," *European Journal of International Management*, vol. 13, no. 6, pp. 757–784, 2019.

[16] N. Nuruzzaman, A. S. Gaur, and R. B. Sambharya, "A microfoundations approach to studying innovation in multinational subsidiaries," *Global Strategy Journal*, vol. 9, no. 1, pp. 92–116, 2019.

[17] D. O'Brien, P. Sharkey Scott, U. Andersson, T. Ambos, and N. Fu, "The microfoundations of subsidiary initiatives: how subsidiary manager activities unlock entrepreneurship," *Global Strategy Journal*, vol. 9, no. 1, pp. 66–91, 2019.

[18] A. Strobl, F. Bauer, and K. Matzler, "The impact of industry-wide and target market environmental hostility on entrepreneurial leadership in mergers and acquisitions," *Journal of World Business*, vol. 55, no. 2, 2020.

[19] A. Burmeister, M. B. Lazarova, and J. Deller, "Repatriate knowledge transfer: antecedents and boundary conditions of a dyadic process," *Journal of World Business*, vol. 53, no. 6, pp. 806–816, 2018.

[20] Y. Su and T. C. Li, "Simulation analysis of knowledge transfer in a knowledge alliance based on a circular surface radiator model," *Complexity*, vol. 2020, Article ID 4301489, 2020.

[21] C. C. J. M. Millar and C. J. Choi, "Reverse knowledge and technology transfer: imbalances caused by cognitive barriers in asymmetric relationships," *International Journal of Technology Management*, vol. 48, no. 3, pp. 389–402, 2009.

[22] V. Peltokorpi, "Corporate language proficiency and reverse knowledge transfer in multinational corporations: interactive effects of communication media richness and commitment to headquarters," *Journal of International Management*, vol. 21, no. 1, pp. 49–62, 2015.

[23] X.-Y. Ren and S.-L. Yang, "Research on the influencing factors of reverse knowledge transfer in M&A by enterprises in developing countries," *Scientific Management Research*, vol. 35, no. 10, pp. 169–174, 2015.

[24] V. Peltokorpi and S. Yamao, "Corporate language proficiency in reverse knowledge transfer: a moderated mediation model of shared vision and communication frequency," *Journal of World Business*, vol. 52, no. 3, pp. 404–416, 2017.

[25] L. Rabbiosi and G. D. Santangelo, "Parent company benefits from reverse knowledge transfer: the role of the liability of newness in MNEs," *Journal of World Business*, vol. 48, no. 1, pp. 160–170, 2013.

[26] N. Driffield, J. H. Love, and Y. Yang, "Reverse international knowledge transfer in the MNE: (where) does affiliate performance boost parent performance?" *Research Policy*, vol. 45, no. 2, pp. 491–506, 2016.

[27] M. E. Sanchez-Vidal, R. Sanz-Valle, and M. I. Barba-Aragon, "Repatriates and reverse knowledge transfer in MNCs," *The International Journal of Human Resource Management*, vol. 29, no. 10, pp. 1767–1785, 2018.

[28] M. M. Raziq, C. D. Rodrigues, F. M. Borini, O. F. Malik, and A. Saeed, "Linking corporate entrepreneurship, expatriation and reverse knowledge transfers," *European Journal of Innovation Management*, vol. 23, no. 1, pp. 67–89, 2019.

[29] O. Bertrand and L. Capron, "Productivity enhancement at home via cross-border acquisitions: the roles of learning and contemporaneous domestic investments," *Strategic Management Journal*, vol. 36, no. 5, pp. 640–658, 2015.

[30] J. Wu, C. Wang, J. Hong, P. Piperopoulos, and S. Zhuo, "Internationalization and innovation performance of emerging market enterprises: the role of host-country institutional development," *Journal of World Business*, vol. 51, no. 2, pp. 251–263, 2015.

[31] H. Chia-Wen and Y. Chih, "R&D internationalization and innovation performance," *International Business Review*, vol. 24, no. 2, pp. 187–195, 2015.
[32] C. Su and L. Kong, "The challenge of Chinese state-affiliated multinationals in benefiting from foreign subsidiary knowledge transfer: a criticism of light-touch integration," *Thunderbird International Business Review*, vol. 62, no. 3, pp. 1–17, 2020.
[33] J. Wei, D. Wang, and Y. Liu, "Weakness and legalization strategies in the country of origin-a case study of cross-border mergers and acquisitions of emerging economic enterprises," *Management Word*, vol. 36, no. 3, pp. 101–120, 2020.
[34] W. Y. Degbey, T. Eriksson, P. Rodgers, and N. Oguji, "Understanding cross-border mergers and acquisitions of African firms: the role of dynamic capabilities in enabling competitiveness amidst contextual constraints," *Thunderbird International Business Review*, vol. 43, no. 5, pp. 1–17, 2020.
[35] R. M. Sarala and E. Vaara, "Cultural differences, convergence, and crossvergence as explanations of knowledge transfer in international acquisitions," *Journal of International Business Studies*, vol. 41, no. 8, pp. 1365–1390, 2010.
[36] K.-X. Chen, H.-M. Xie, and X.-M. Cheng, "Reverse learning mechanism of technology acquisition transnational M&A in emerging markets," *Studies in Science of Science*, vol. 36, no. 6, pp. 1048–1057, 2018.
[37] H. C. Chen, Z. Cong, and J. Zhang, "The influence of institutional gap on the system dynamics of reverse knowledge transfer in multinational corporations-the logic of legality and efficiency," *Science & Technology Progress and Policy*, vol. 37, no. 3, pp. 124–132, 2020.
[38] M. Ahsan and S. A. Fernhaber, "Multinational enterprises: leveraging a corporate international entrepreneurship lens for new insights into subsidiary initiatives," *Journal of International Management*, vol. 25, no. 1, pp. 51–65, 2018.
[39] J. Birkinshaw, D. Crilly, C. Bouquet, and S. Y. Lee, "How do firms manage strategic dualities? a process perspective," *Academy of Management Discoveries*, vol. 2, no. 1, pp. 51–78, 2016.
[40] J. Birkinshaw, A. Zimmermann, and S. Raisch, "How do firms adapt to discontinuous change? Bridging the dynamic capabilities and ambidexterity perspectives," *California Management Review*, vol. 58, no. 4, pp. 36–58, 2016.
[41] N. J. Foss and T. Pedersen, "Transferring knowledge in MNCs," *Journal of International Management*, vol. 8, no. 1, pp. 49–67, 2002.
[42] S. R. Nair, M. Demirbag, and K. Mellahi, "Reverse knowledge transfer from overseas acquisitions: a survey of Indian MNEs," *Management International Review*, vol. 55, no. 2, pp. 277–301, 2015.
[43] J.-Y. Jia and Z.-X. Zhao, "Knowledge transfer and dynamic technology capability improvement of cross-border M&A by creative asset-seeking Chinese enterprises-a case study of Nanjing automobile," *Modern Management Science*, no. 4, pp. 9–11, 2015.
[44] S. R. Nair, M. Demirbag, and K. Mellahi, "Reverse knowledge transfer in emerging market multinationals: the Indian context," *International Business Review*, vol. 25, no. 1, pp. 152–164, 2016.
[45] Y. Su and Y. Q. Yu, "Spatial agglomeration of new energy industries on the performance of regional pollution control through spatial econometric analysis," *Science of the Total Environment*, vol. 704, Article ID 135261, 2020.
[46] T. Nery-Kjerfve and G. N. Mclean, "Repatriation of expatriate employees, knowledge transfer, and organizational learning," *European Journal of Training & Development*, vol. 36, no. 6, pp. 614–629, 2012.
[47] J. A. Gonzalez and S. Chakraborty, "Expatriate knowledge utilization and MNE performance: a multilevel framework," *Human Resource Management Review*, vol. 24, no. 4, pp. 299–312, 2014.
[48] R. Zeng, B. Grøgaard, and P. Steel, "Complements or substitutes? a meta-analysis of the role of integration mechanisms for knowledge transfer in the MNE network," *Journal of World Business*, vol. 53, no. 4, pp. 415–432, 2018.
[49] A. Burmeister, J. Deller, J. Osland, B. Szkudlarek, G. Oddou, and R. Blakeney, "The micro-processes during repatriate knowledge transfer: the repatriates' perspective," *Journal of Knowledge Management*, vol. 19, no. 4, pp. 735–755, 2015.
[50] Y. Su and Y.-q. Yu, "Spatial association effect of regional pollution control," *Journal of Cleaner Production*, vol. 213, pp. 540–552, 2019.
[51] G. Oddou, B. Szkudlarek, J. S. Osland, J. Deller, R. Blakeney, and N. Furuya, "Repatriates as a source of competitive advantage," *Organizational Dynamics*, vol. 42, no. 4, pp. 257–266, 2013.
[52] C. Park and I. Vertinsky, "Reverse and conventional knowledge transfers in international joint ventures," *Journal of Business Research*, vol. 69, no. 8, pp. 2821–2829, 2016.
[53] M. F. Ahammad, S. Y. Tarba, Y. Liu, and K. W. Glaister, "Knowledge transfer and cross-border acquisition performance: the impact of cultural distance and employee retention," *International Business Review*, vol. 25, no. 1, pp. 66–75, 2016.
[54] M. Yamin and U. Andersson, "Subsidiary importance in the MNC: what role does internal embeddedness play?" *International Business Review*, vol. 20, no. 2, pp. 151–162, 2011.
[55] Z. Mustaffa, "Subsidiary knowledge flows in multinational corporations: research accomplishments, gaps, and opportunities," *Journal of World Business*, vol. 47, no. 3, pp. 383–396, 2012.
[56] M. L. Sheng, N. N. Hartmann, Q. Chen, and I. Chen, "The synergetic effect of multinational corporation management's social cognitive capability on tacit-knowledge management: product innovation ability insights from asia," *Journal of International Marketing*, vol. 23, no. 2, pp. 94–110, 2015.
[57] S. He, Z. Khan, and O. Shenkar, "Subsidiary capability upgrading under emerging market acquirers," *Journal of World Business*, vol. 53, no. 2, pp. 248–262, 2018.
[58] S. Estrin, K. E. Meyer, and A. Pelletier, "Emerging economy MNEs: how does home country munificence matter?" *Journal of World Business*, vol. 53, no. 4, pp. 514–528, 2018.
[59] N. Wang and Y. Wang, "Does parenting matter in subsidiary innovation in emerging economies? exploring the role of parent superior competitiveness in affecting subsidiary contextual ambidexterity," *International Business Review*, 2020.
[60] M. Lazarova and I. Tarique, "Knowledge transfer upon repatriation," *Journal of World Business*, vol. 40, no. 4, pp. 361–373, 2005.
[61] Y. S. Pak, W. Ra, and J. M. Lee, "An integrated multi-stage model of knowledge management in international joint ventures: identifying a trigger for knowledge exploration and knowledge harvest," *Journal of World Business*, vol. 50, no. 1, pp. 180–191, 2015.
[62] T. Kostova, "Transnational transfer of strategic organizational practices: a contextual perspective," *Academy of Management Review*, vol. 24, no. 2, pp. 308–324, 1999.

[63] A. J. Zhou, C. Fey, and S. Prashantham, “Building disseminative capacity in reverse knowledge transfer,” *Academy of Management Proceedings*, 2016.

[64] D. B. Minbaeva, T. Pedersen, I. Björkman, and C. F. Fey, “A retrospective on: MNC knowledge transfer, subsidiary absorptive capacity, and HRM,” *Journal of International Business Studies*, vol. 45, no. 1, pp. 52–62, 2014.

[65] I. Vertinsky, “Reverse and conventional knowledge transfers in international joint ventures,” *Journal of Business Research*, vol. 69, no. 8, pp. 2821–2829, 2016.

[66] R. Mudambi, L. Piscitello, and L. Rabbiosi, “Reverse knowledge transfer in MNEs: subsidiary innovativeness and entry modes,” *Long Range Planning*, vol. 47, no. 1-2, pp. 49–63, 2014.

[67] S. Grimbeek, S. Koch, and R. Grimbeek, “The consistency of merger decisions at the South African competition commission,” *South African Journal of Economics*, vol. 81, no. 4, pp. 561–580, 2013.

[68] F. Kiesel, J. M. Ries, and A. Tielmann, “The impact of mergers and acquisitions on shareholders’ wealth in the logistics service industry,” *International Journal of Production Economics*, vol. 193, pp. 781–797, 2017.

[69] Z. Chen, P. Wanke, and M. G. Tsionas, “Assessing the strategic fit of potential M&As in Chinese banking: a novel Bayesian stochastic frontier approach,” *Economic Modelling*, vol. 73, pp. 254–263, 2018.

[70] F. A. A. Becker-Ritterspach, “The social constitution of knowledge integration in MNEs: a theoretical framework,” *Journal of International Management*, vol. 12, no. 3, pp. 358–377, 2006.

[71] Z. L. Yang, H. Garg, J. Li, G. Srivastavad, and Z. Cao, “Investigation of multiple heterogeneous relationships using a q-rung orthopair fuzzy multi-criteria decision algorithm,” *Neural Computing and Applications*, pp. 1–22, 2020.

[72] D. Fridernan, “Evolutionary games in economics,” *Econometrica*, vol. 59, no. 3, pp. 637–666, 1991.

[73] A. M. Lyapunov, “The general problem of the stability of motion,” *International Journal of Control*, vol. 31, no. 3, pp. 353-354, 1994.

[74] S. Mendoza-Palacios and O. Hernández-Lerma, “Evolutionary dynamics on measurable strategy spaces: asymmetric games,” *Journal of Differential Equations*, vol. 259, no. 11, pp. 5709–5733, 2015.

[75] Y. Su and W. Sun, “Analyzing a closed-loop supply chain considering environmental pollution using the NSGA-II,” *IEEE Transactions on Fuzzy Systems*, vol. 27, no. 5, pp. 1066–1074, 2019.

[76] O. S. Al-Kwifi, “Exploring the influence of home country factors on rapid internationalization of emerging multinational companies,” *Journal for International Business and Entrepreneurship Development*, vol. 12, no. 4, 2020.

[77] Y. Liu and K. E. Meyer, “Boundary spanners, HRM practices, and reverse knowledge transfer: the case of Chinese cross-border acquisitions,” *Journal of World Business*, vol. 55, no. 2, 2020.

[78] S. R. Nair, M. Demirbag, K. Mellahi, and K. G. Pillai, “Do parent units benefit from reverse knowledge transfer?” *British Journal of Management*, vol. 29, no. 3, pp. 428–444, 2018.

[79] M. Kandora, “Managing reverse knowledge flows in routine replication programs: the case of global manufacturing ERP template rollout,” *Journal of Management and Business Administration. Central Europe*, vol. 26, no. 2, pp. 47–75, 2018.

[80] B. Decreton, P. C. Nell, and D. Stea, “Headquarters involvement, socialization, and entrepreneurial behaviors in MNC subsidiaries,” *Long Range Planning*, vol. 52, no. 4, 2019.

[81] D. O’Brien, P. S. Scott, and U. Andersson, “Strategy Creativity in Multinational Subsidiaries,” *Palgrave Macmillan*, Cham, Switzerland, pp. 191–210, , 2018.

[82] Q. Yang, R. Mudambi, and K. E. Meyer, “Conventional and reverse knowledge flows in multinational corporations,” *Journal of Management*, vol. 34, no. 5, pp. 882–902, 2008.

[83] M.-C. Huang, Y.-P. Chiu, and T.-C. Lu, “Knowledge governance mechanisms and repatriate’s knowledge sharing: the mediating roles of motivation and opportunity,” *Journal of Knowledge Management*, vol. 17, no. 5, pp. 677–694, 2013.

[84] A.-W. Harzing, M. Pudelko, and B. Sebastian Reiche, “The bridging role of expatriates and inpatriates in knowledge transfer in multinational corporations,” *Human Resource Management*, vol. 55, no. 4, pp. 679–695, 2016.

[85] D. Minbaeva, C. Park, I. Vertinsky, and Y. S. Cho, “Disseminative capacity and knowledge acquisition from foreign partners in international joint ventures,” *Journal of World Business*, vol. 53, no. 5, pp. 712–724, 2018.