HOST COUNTRY NETWORK INTEGRATION, HOME COUNTRY GOVERNMENT INVOLVEMENT, AND CORPORATE OVERSEAS SURVIVAL: EVIDENCE FROM CHINA

Yan CHEN¹ Jie GAO² Yuqi CAO³ Jialin GUAN⁴

Abstract

Traditional overseas survival of enterprises theories can no longer meet the needs of enterprises' internationalization. With Chinese companies gradually integrating into the global network, it becomes a problem to be solved urgently that how should companies use their host country network to improve overseas survival performance. To make up for this theoretical gap, based on social network theory and enterprise survival theory, we conducted a Cox survival function analysis on 479 overseas subsidiaries established by 213 Chinese listed companies from 2005 to 2015. The results show that host country network–integration density significantly negatively impacts a company's overseas survival. Host country network–integration breadth positively impacts a company's overseas survival. Government participation weakens the negative impacts of the host country's network–integration density on a company's overseas survival. At the same time, the heterogeneity of the host country affects a company's overseas survival. At the moderating effect of government participation. This article breaks through the limitations of the existing research using the monistic perspective, further improve the theoretical framework of the "survival determinism of overseas subsidiaries". The article also provides a new analytical perspective and

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¹ School of Economics and Management, Beijing University of Posts and Telecommunications, Beijing, China. Email: chen_yan@bupt.edu.cn.

² Corresponding Author. School of Economics and Management, Beijing University of Posts and Telecommunications, Beijing, China. Email: gaojie_j@126.com.

³ School of Economics and Management, Beijing University of Posts and Telecommunications, Beijing, China. Email: caoyq616@163.com.

⁴ School of International Economics and Trade, Jilin University of Finance and Economics, Changchun, Jilin Province, China. Email: 106022 @jlufe.edu.cn.



theoretical paradigm for companies' overseas survival from a network perspective through the exploration of the characteristics of overseas subsidiaries' integration into the host country network, which provides the possibility to promote Chinese overseas subsidiaries to build new advantages in the international competition.

Keywords: overseas enterprise survival, host country network–integration density, host country network–integration breadth, government participation, host country heterogeneity

JEL Classification: D22, F23, L22, L25, R38

1. Introduction

With the development of economic globalization and the continuous advancement of the "Go Global" strategy, China's foreign investment has gradually entered a stage of high-quality development. Although the growth rate of China's foreign direct investment has slowed in 2019, its foreign direct investment still reached US\$110.6 billion, and 5,791 foreign companies in 166 countries and regions around the world carried out non-financial direct investment. With the support of government policies, some Chinese companies have achieved breakthroughs through foreign investment, such as Zoomlion, Geely, and Joyson Electronics. The springboard theory points out that emerging economies can obtain important strategic assets by entering the international market as well as explore potential opportunities to enhance a company's international competitive advantage. However, the "going out" of many Chinese companies has failed to not only "go up" (to gain an international competitive advantage) but also "go on" (to survive). Complex host country environments and changing economic situations have all challenged the overseas survival of enterprises. The survival rate of overseas subsidiaries of Chinese multinational enterprises is not optimistic. Many enterprises face the dilemma of not being able to continue local operations and whether to withdraw from the host country market or be acquired by other companies. For example, China National Construction Engineering Corporation was forced to withdraw from a reconstruction project in the Malawi region of the Philippines. Minmetals Resources Co., Ltd. acquired a large copper mine in Las Bambas, Peru, but conflict between cultural and environmental protection stalled copper production and transportation. Given the same policy support, why are the results of corporate overseas investments very different? What key factors determine a company's ability to survive overseas? With the weakening momentum of global economic growth, the intensification of conflict between countries and the new coronavirus epidemic impacting the global economic market, how should companies seek effective overseas survival strategies?

Studies have shown that multinational companies have networked attributes and operate in intersecting networks with geographic and spatial dimensions (Propris and Storai, 2019). Overseas subsidiaries are important nodes of the network organization, and their relationship networks and positions in the network have important impacts on the enterprise (Gulati and Zaheer, 2000). With the continuous deepening of economic globalization, integration into overseas networks has become an important way for multinational companies to improve their overseas survival rates, cultivate their core competitiveness, and effectively participate in international competition. It is highly significant to study corporate survival issues from a network perspective. However, despite the recognized importance and academic value of corporate networks, most of the literature focuses on specific industries or resource networks, such as the impact of buyer–supplier networks on corporate international performance (Gulati and Zaheer, 2000) or the impacts of knowledge-innovation

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networks on corporate innovation performance (Patel et al., 2014), for example. Most research on overseas network relations focuses on companies' market sensitivity (Rowley et al., 2000), R&D capabilities (Achcaoucaou & Miravitlles, 2012), innovation output, and financial performance (Johanson and Vahlne, 2009; Turkina and Van Assche, 2016). In overseas networks, the host country's network relationships are not only a source for overseas subsidiaries to obtain core strategic resources (Subramaniam and Venkatraman, 2001) but also a market basis for their overseas operations. The host country's network relationships play an important role in overseas subsidiaries upgrading their products and technologies, accumulating practical experience, and creating knowledge and capabilities. However, few studies have considered the overseas survival of companies from the perspective of the host country's network. Second, although companies can obtain strategic resources by integrating themselves into the host country network and enhance their competitiveness in the international market, the time, resources, and coordination costs required to do so cannot be ignored (Fei and Yan, 2019). Therefore, an important question is whether there is an absolute positive correlation between the degree of integration of the company's overseas network and its overseas survival. Will the different modes of overseas network integration, such as the density and breadth of network integration, have different impacts on a company's overseas survival? Given limited resources, how should enterprises formulate effective overseas network-integration strategies to improve survival performance? Existing research fails to precisely define the concept of host country network integration, nor does it deeply explore and comb the host country network integration theory. Thus, there is a certain theoretical gap. Third, most of the existing literature uses multinational companies in advanced economies as research samples. Enterprises in emerging economies, as represented by China, are usually based on a lack of ownership advantages due to historical, institutional, and cultural reasons (Rugman, 2010; Nguyen and Rugman, 2015), the overseas investment models of these enterprises have many differences, and the host country network integration model of these overseas subsidiaries is also unique. Fourth, the existing literature on the survival of companies overseas ignores the heterogeneity of companies. Governments promote outward investment of enterprises in the emerging market countries, and the difference in ownership type is one of the key reasons for the difference in internationalization strategies between multinational companies in developed countries and enterprises in emerging economies (Buckley et al. 2007; Cazurra et al., 2014). Therefore, it is necessary to study enterprises' overseas survival from the perspective of heterogeneity of enterprise ownership. In addition, the economic development level of the host country, as a market for companies operating overseas, also has a nonnegligible impact on the company's overseas survival. So, is there a difference between the overseas operations of enterprises in developed countries and those in developing countries? Does host country network integration manifest differently in countries with different levels of economic development? Existing research fails to give an answer. Finally, most existing studies use questionnaire surveys and case studies. Their theoretical results lack measurements of empirical indicators or supporting data.

Based on the above research gaps, China's overseas subsidiaries are taken as research object and the theory of "host country network integration" has been put forward based on social network theory and corporate network theory. The theory not only deeply analyzes the survival path mechanism of overseas subsidiaries in the network context from the two aspects of host country network–integration density and host country network–integration breadth, but also has developed the theoretical framework of the "survival determinism of overseas subsidiaries", providing a theoretical basis for the Chinese companies to make better use of the host country's network resources and develop new advantages in



international competition. Specifically, this paper makes theoretical contributions in four respects. First, based on network theory, this paper cuts in from the perspective of the host country's network integration, breaking through previous research that has been limited to the internal management capabilities of overseas companies (such as the company's innovation and R&D intensity, etc.) and external environmental factors (such as host country system factors), for example, to provide a new analytical perspective and theoretical paradigm for the company's overseas survival. Secondly, this paper draws upon the classification of networks in the existing studies (Rowley et al., 2000; Patel et al., 2014) and refines the degree of host-country-network integration into host country network-integration density and host country network-integration breadth. The different influence mechanisms and internal paths of the host country's network integration density and breadth to the company's overseas survival were investigated. At the same time, it also fills the theoretical gaps within current academic circles about the concept of host-country-network integration and about variable measurement methods. Third, this article uses Chinese companies as the sample, which supplements the theoretical gap in the survival of overseas subsidiaries of multinational companies in the emerging economies from a network perspective, and provides reference significance and innovative development ideas for Chinese companies' overseas survival. Therefore, this study has important theoretical value and practical significance for overseas investment by the Chinese enterprises. Fourth, starting from the type of enterprise ownership, this article examines the moderating effect of a state-owned background on the relationship between host-country-network integration and the enterprise's survival, thus supplementing the relevant theoretical gaps. Fifth, this paper groups the research sample according to the host country's economic development level, classifies the host country network's integration between developed and non-developed countries, and provides a reference for emerging economies to choose suitable investment areas. Finally, by manually reviewing the annual reports of Chinese listed companies from 2005 to 2015, we collected and compiled relevant information about overseas subsidiaries over the years, such as survival status, registration location, parent company holding ratio, and investment countries. The overseas survival database of Chinese companies in 63 host countries (countries/regions) provides an in-depth empirical analysis of how the host country's network integration affects the survival of overseas subsidiaries, providing reliable data support with higher universality and credibility than those of case studies.

2. Theoretical analysis and research hypothesis

Enterprise network relationships are made up of "nodes" composed of companies, trade associations, business organizations, or other organizations, and the "links" of these "nodes" (Brass *et al.*, 2004), which is highly significant to an enterprise's operations and competitive advantages. The existing literature has different definitions and measurement standards for different enterprise network relationships, such as distributor network relationships (Anderson and Narus, 2007) and knowledge network relationships (Clercq and Dimov, 2008). This paper draws on existing research and combines the special characteristics of the host country network to comprehensively define an enterprise's host-country-network integration using the host country network–integration density (ND) and the host country network–integration breadth (NB) (Amalesh *et al.*, 2019; Patel *et al.*, 2014; Li and Zhang, 2016).

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ND refers to the depth of connection or the degree of interconnection between network members. Studies have shown that higher network density can help companies reduce costs, increase the speed of their information exchange, and promote the formation of trust and common rules of conduct among network members, thereby enhancing the convergence of each other's actions and facilitating subsequent cooperation (Li and Zhang, 2016). However, not all network effects are positive. Overly high network density will make enterprises repeatedly obtain the same information resources, cause information overload, reduce the efficiency of information utilization, disperse enterprises' market attention, and negatively affect knowledge development.

Second, as the network density increases, the inherent rights dynamics within the original network relationship will be gradually broken. For example, in the "buyer-supplier" network (Sharma *et al.*, 2019; Amalesh *et al.*, 2019), suppliers at lower levels are in a fragile state in the network relationship due to lack of specific advantages. They are resistant to the new trust and commitment problems brought about by the deepening of network density, which adversely affects the companies' overseas operations.

Finally, the increase in network density hinders companies' ability to obtain new information. The locked interaction between network partners will lock the enterprise into the existing network relationships, resulting in a lack of flexibility and path dependence preventing an organization from establishing new relationships with other companies outside the existing network and thus forming a network lock. The "space trap" is not conducive to new market relations and capabilities expanding (Fazio and Lavecchia, 2013; Mc Fadyen and Cannella, 2004), which ultimately affects the survival of overseas subsidiaries.

NB refers to the scope of overseas enterprises' integration into the host country network and the ability to develop new network relationships. During the enterprise-internationalization process, enterprises must establish external network relationships to form unique network assets for overseas enterprises as a source of enterprise-specific advantages and to ensure that enterprises can quickly obtain low-cost key information. As the network's breadth increases, increasing numbers of members will act as "nodes" in the network, which raises the opportunities for enterprises to communicate and cooperate with network members (Rowley *et al.*, 2000). Other network members bring different knowledge in terms of quality, quantity and type (Freel, 2000), and enterprises integrating these network resources by enterprises can promote value co-creation (Elfring, 2003). Having more strong connections in overseas markets can increase the timeliness, richness, and effectiveness of the information resources obtained by enterprises and can help enterprises to more accurately and quickly identify market information and seize opportunities in overseas markets (Rowley *et al.*, 2000).

Based on this, the article makes the following assumptions:

- **Hypothesis 1:** The higher the density of the host country's network integration, the more disadvantageous it will be for Chinese companies to survive overseas.
- **Hypothesis 2:** The higher the breadth of the host country's network integration, the more beneficial it is for Chinese companies to survive overseas.

Institutional factors play extremely important roles in enterprises' internationalization. Child and Rodrigues (2005) found that Chinese companies have overcome many disadvantages in overseas markets by taking advantage of the system provided by the government. On the one hand, state-owned enterprises can rely on their government background to obtain more superior institutional advantages (Hennart, 2012), obtain wider information and resource channels in a timely manner, and accurately capture changes in the host country's

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institutional environment and market environment, thereby weakening the adverse effects caused by excessively high host country network–integration density, such as low information utilization rate and severe path dependence. On the other hand, state-owned enterprises can establish strong connection networks with host-country market actors thanks to strong capital, resource support, and home-government intervention (Buckley and Clegg, 2017). Strong government support can improve enterprises' ability to identify and obtain effective channels, expand the number and geographical scope of high-quality partners, and then quickly build a host-country-relationship network, further increase the breadth of host-country-network integration, and improve overseas survivability.

Based on this, this paper proposes the following hypothesis:

Hypothesis 3A: Government background weakens the negative influence of host country network–integration density on enterprises' overseas survival.

Hypothesis 3B: Government background strengthens the positive influence of the host country network-integration breadth on enterprises' overseas survival.





Research Framework

3. Sample data and variable selection

3.1 Data source and sample selection

The research sample selected in this paper was the overseas subsidiaries of China's Ashare-listed companies from 2005 to 2015, and the data sources are the Guotai'an database (CSMAR) and Wind database. First, we horizontally matched the "List of Listed Companies in Shanghai and Shenzhen" and the "List of Overseas Investment Enterprises (Institutions)" by the Ministry of Commerce according to the company's name, from which we obtained a list of listed companies that conducted foreign direct investment activities from 2005 to 2015. Then, according to the companies' annual reports, we manually collected and organized relevant data about overseas companies of listed multinational companies. At the same time, in order to make the article's conclusions more accurate and combine its research needs, the data were screened and revised as follows. (1) Transnational investments in "tax havens" such as the British Virgin Islands, Cayman Islands, and Bermuda were deleted from the sample. (2) Given the financial industry's complexity, its sample data were removed. (3) Given the shipping industry's particularities, its sample data were removed. (4) Considering the availability of network data, overseas subsidiaries whose establishment year was consistent with the time of listing were removed from the sample. (5) Missing data and incomplete information from overseas companies were removed from the sample. (6) If the

registration place of overseas companies was inconsistent with the main business place, this article used the place of registration. (7) The start of the enterprise's survival time begins from the time of registration rather than from the capital injection/operation time. (8) The difference between direct and indirect holding was not considered when considering the proportion of parent company to subsidiary. (9) Subsidiaries were deleted when the parent company failed within the research period. Finally, investment data from 213 Chinese listed companies and 479 overseas companies were obtained, involving 63 host countries (countries/regions).

3.2 Definitions of the variables

(1) Independent variable

The two independent variables in this article are ND and NB.

ND measures the depth of the connections or the degree of interconnection between network members. Consistent with the existing literature, we set the calculation formula of network density as the ratio of the number of actual connections between network members to the number of potential connections (Ahuja, 2000, Rowley *et al.*, 2000). The formula is as follows:

$$Network \ Density(ND) = \frac{Actual \ Number \ of \ Ties \ among \ Network \ Members}{Potential \ Number \ of \ Ties}$$
(1)

NB measures the scope of overseas companies' integration into the host country network and their ability to develop new network relationships. This independent variable lacks a clear definition in the relevant academic fields. This article integrates the host country network into the business relationship level and the host country's investment experience. According to Patel *et al.* (2014) and other documents, we use the Herfindahl-Hirschman index to measure the host country's breadth of network integration:

$$Network Breadth(NB) = \frac{1 - \sum_{i}^{m=4} (weight_i \times count_i)^2}{weight_{max} \times count_{weight \neq 0}}$$
(2)

In formula (2), count_i in the numerator represents the number of overseas subsidiary partners established by the same parent company in the year before the overseas subsidiary was established, and weight_i corresponds to the host country network's strength for each overseas enterprise. The weight_{max} in the denominator represents the maximum value under the controlling share of the same parent company in the year before the overseas subsidiary was established. This article follows the classification definition of Demirbag *et al.* (2009), who used 10%, 50%, and 90% nodes to measure the controlling share of the parent company of overseas subsidiaries. High-strength full ownership is when the parent company owns more than 90% of the subsidiary's equity, denoted as 4; higher-intensity majority ownership is when the parent company owns between 51% to 90% of the subsidiary's equity, denoted as 3; medium-strength peer ownership is when the parent company owns 50% of the subsidiary's equity, denoted as 2; and low-intensity minority ownership is when the parent company owns 10% to 49% of the subsidiary's equity a, denoted as 1. Securities investment is defined as the parent company holding less than 10% of overseas companies and will not be studied.

(2) Dependent variables

Survival state (SS) of overseas enterprises is the survival of overseas companies according to the sample data at the end of the research period (*i.e.*, the end of 2015). SS is 1 if the company survived, SS is 0 if the company died (including reorganization, bankruptcy, and



liquidation). In order to avoid incomplete data and the limitations of the statistical period, this article deals with some special cases. (1) If the overseas subsidiary disappeared according to the annual report in a certain year but still existed later, the subsidiary was considered to have survived (survival time), including in the years when it disappeared in the middle. Only the subsidiaries that did not appear in the annual report for the statistical period after they disappeared in a certain year were considered dead. (2) Because the statistical period was 2005 to 2015, the standard of survival was determined as enterprises remaining at the end of 2015.

Survival time (ST) of overseas enterprises is the time it takes for overseas subsidiaries to enter the host country market and exit the market. If the company continued to exist at the end of the observation period (2015), ST was recorded as the time elapsed from when the overseas subsidiary entered the host country market until 2015.

(3) Moderating variable

Corporate heterogeneity represents the government involvement (GI). This paper uses a dichotomous dummy variable to measure government participation in enterprises. If the enterprise was a state-owned enterprise, the value was 1; if the enterprise was a non-state-owned enterprise, the value was 0.

(4) Control variables

Regarding the subsidiary entry mode (Mode), the different entry modes of overseas subsidiaries symbolize their different levels of resource commitment to overseas markets, which will affect the subsidiaries' performance. In this article, the proportion of the company's share of overseas companies was used to measure the subsidiary's entry-model variables. The higher the shareholding level, the more overseas investment and the higher the parent company's control. The subsidiaries' entry mode was measured using the parent company's controlling proportion, as shown in Table 1:

Table 1

Relationship between the parent company's controlling proportion and the entry mode of overseas subsidiaries

Holding percentage %	Subsidiary entry mode
>90	4
51–90	3
50	2
10–49	1

Environmental mutation (EM) is caused by sudden large events. The environmental mutations, including wars, financial market turmoil, and natural disasters, can significantly affect enterprises' survival performance. This paper studies the time span from 2005 to 2015, during which the financial crisis of 2008 and 2009 had negative impacts on the global economy. Therefore, a dummy variable for this was established. If the year was 2008 or 2009, the dummy variable was 1, for the other years, the dummy variable was 0.

The host country's population (Ln_population, Ln_p) was processed logarithmically. Usually, the host country's population represents the host country's potential consumer market size.

Parent company age (PA) was the time from the parent company's establishment to 2015.

The trade relationship between the home country and the host country (Ln_Trade relationship, Ln_TR) was defined as the ratio of bilateral trade volume between the home

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country and the host country to the sum of the GDP of the two countries, which was treated as a logarithm. Table 2 summarizes the dependent, independent, moderating and control variables in this article.

Table 2

Variable type	Variable name	Symb ol	Data Source
Dependent variable	Survival State	SS	Lieted company annual report
Dependent variable	Survival Time	ST	
Independent	Network Integration Density	ND	Listed company appual report
variable	Network Integration Breadth	NB	
Moderating variable	Governmen t Involvemen t	GI	Wind database
	Subsidiary entry mode	Mode	Listed company annual report
	Environme nt Mutation	EM	financial crisis
Control variable	Population	Ln_p	Population Net
	Parent Company Age	PA	Listed company annual report
	Trade relationship	Ln_TR	China Ministry of Commerce Database

Variables and measurement

3.3 Preliminary analysis of Chinese companies' overseas survival

Table 3 details the statistical analysis of overseas subsidiaries' survival status from 2005 to 2015. One may see from Table 3 that the samples with a survival time of 10 years or more in China's overseas subsidiaries accounted for only 0.42% of the total sample, and the samples with a survival time of 5-10 years accounted for only 13.57% of the total sample, while the sample with a survival duration of 2-5 years was relatively large, accounting for 50.52% of the total sample, and the samples with a survival time of 1 year or less accounted for more than 1/3 of the total sample. Furthermore, the calculation based on the original data shows that the average survival duration of China's overseas companies was only 2.58 years, while the average survival time of domestic companies was 7–8 years. These data are consistent with the existing literature and actual conditions, indicating that the Chinese companies' overseas survival conditions are poor. Table 4 shows the sample's descriptive statistics and correlation density and enterprises' overseas survival, while there is a



positive correlation between the host country network-integration breadth and enterprises' overseas survival. Government involvement itself has no significant impact on the survival of enterprises. There is a significant positive correlation between the entry mode of the subsidiary and the survival of the company. The higher the shareholding ratio in the subsidiary, the more beneficial the company's overseas survival. Environmental Mutation has a significant negative impact on the survival of companies overseas, the impact of the financial crisis on the survival of companies overseas cannot be ignored. The host country's population has no significant impact on the survival of the enterprise. The age of the parent company and the economic and the trade relationship between the home country and the host country all have a positive impact on the survival of the company, but they are not significant. The correlation analysis of the original sample initially verified the hypothesis of this article. The VIF values of all of the variables were lower than 10, the tolerance was higher than 0.1, and the sample data had no multicollinearity.

Table 3

State	Number of enterprises (households)	Proportion	
Total samples:	479	100%	
Survival (Survival=1)	428	89.35%	
Death (Survival=0)	51	10.65%	
Survival Time:			
1 year and below	170	35.49%	
2-5 years (excluding 5 years)	242	50.52%	
5-10 years (excluding 10 years)	65	13.57%	
10 years and above	2	0.42%	

The overseas survival status of the sample companies

Table 4

Descriptive	statist	tics and	coll	inearity	test
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Variables	Ν	Mean	Standard deviation	Minimum	Maximum	Tolerance	VIF
ND	479	0.36	0.36	0.00	0.98	0.95	1.06
NB	479	0.07	0.09	0.00	0.23	0.96	1.05
Mode	479	3.72	0.54	1.00	4.00	0.98	1.02
EM	479	0.08	0.27	0.00	1.00	0.99	1.01
Ln_p	479	16.96	1.92	7.75	20.98	0.85	1.18
PA	479	12.70	3.85	5.00	23.00	0.95	1.05
TR	479	12.97	7.72	-1.00	24.00	0.82	1.23

Based on the Kaplan-Meier (K-M) method, this paper makes a preliminary analysis of the overseas survival conditions of the Chinese companies. The analysis function is shown in Figure 2. The Kaplan-Meier method, also known as product-limit estimate, is a survival analysis method that can examine individual factors and control confounding factors by stratification. K-M analysis method can estimate survival rate and draw survival curve, and it is the most commonly used method in survival analysis. The Kaplan-Meier curve uses survival time as the horizontal axis and survival rate as the vertical axis. This continuous stepped curve can illustrate the relationship between sample survival time and survival rate.

Table 5

Correlation analysis

	1	2	3	4	5	6	7	8	9	10
1.ND	1									
2.NB	-0.11*	1								
3.Mode	-0.07	0.001	1							
4.EM	-0.02	-0.06	-0.01	1						
5.Ln_P	0.02	0.02	-0.04	-0.001	1					
6.PC_Age	-0.15**	0.11*	-0.001	0.08	-0.11*	1				
7.TR	-0.13**	-0.12*	0.12**	0.02	-0.38**	0.09*	1			
8.GI	0.11*	0.002	0.02	0.04	-0.02	-0.02	0.04	1		
9.SV	-0.19**	0.04	0.12**	-0.12**	-0.02	0.01	0.07	-0.03	1	
10.ST	-0.04	-0.09*	-0.01	0.51**	-0.06	0.09*	-0.05	0.03	0.09	1

Figure 2

K-M survival analysis function of the research sample



As one may see in Figure 2, the overall sample survival rate of Chinese overseas companies decreased year by year. Specifically, the survival rate had the largest decline in the first three years of the establishment of the subsidiary, especially in the third year, the graph of the function showed large fluctuations. After entering the sixth year, the overseas survival rate of subsidiaries has gradually stabilized, and a longer period of stability has appeared. One may see that the initial stage of company establishment is the most challenging and risky period for overseas operations. This phenomenon also confirms the classic theory of emerging economics have a general lack of ownership, they will face "outsiders' disadvantage" and "latecomers' disadvantages" when setting up subsidiaries in overseas markets. Therefore, the parent company should focus on reality and make full research before setting up overseas subsidiaries in order to understand the host country's economic development, market size, market competition, cultural distance, and other factors, so as to

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conduct strategic analysis and forecasts on the host country's market and allow overseas subsidiaries have the opportunity and ability to deal with various risks in the start-up period.

4. Results

4.1 Definitions of the variables

(1) The Cox Model

The Cox model was used to empirically analyze the survival of overseas subsidiaries. Cox model, also known as "proportional hazards model", is a semiparametric regression model proposed by the British statistician D. R. Cox (1972). The model can analyze data with censored survival time, and does not require estimation of the survival distribution type of the data, also can analyze the impact of many factors on survival at the same time. The Cox proportional hazards rate model for survival data is a core concept in survival analysis. Setting the risk function to estimate the distribution of the company's survival time and predict the probability of future deadline events has obvious advantages when analyzing longitudinal data. The model can effectively overcome the right-censoring problem common in survival data, and it is widely used in the medical field, considered as the most widely used multivariate analysis method in survival analysis so far. But it is rarely used in international business, and there are currently no rich research results.

(2) Model Design

The two core factors of the Cox model are survival time and specific events. In this article, survival time = overseas subsidiary cancellation time – overseas subsidiary establishment time + 1. In this article, the specific event refers to the death of the overseas subsidiary, the overseas subsidiary's continued survival is denoted by 1, and the overseas subsidiary's death is denoted by 0. Some enterprises had not experienced an exit event at the end of the observation period, so their survival time could not be observed directly. Assuming that the overseas subsidiary has survived to time t and the overseas subsidiary died during t, $t + \Delta t$ ($\Delta t > 0$), the probability is as follows:

$$P(t \le T \le \Delta t | T \ge t) = \frac{P(t \le T \le t + \Delta t)}{P(T \ge t)} = \frac{F(t + \Delta t) - F(t)}{S(t)}$$
(3)

The risk function is defined as follows:

$$\lambda(t, X(t)) = \lambda_0(t)e^{\beta X(t)}$$
⁽⁴⁾

Due to the discrete nature of the X(t) data, a method of estimating independent variables that does not change with time was used to convert the Cox proportional-hazards model into a fixed covariate Cox proportional-hazard models, and the following model was established:

$$In[h_{\nu}(t,X)] = \beta X + \gamma_{t} + \mu$$
⁽⁵⁾

where: X is the independent variable, β is the parameter to be estimated, γ_t is the benchmark risk function, μ is the error term following the normal distribution, and ν is the unobservable heterogeneity. After estimating the parameters of each variable β , the risk ratio was obtained by calculating its $e_{\beta 1}$ index form. If the risk ratio is higher than 1, then an increase in this variable will increase the overseas subsidiary's risk ratio; if the risk ratio is lower than 1, then an increase in this variable can extend the survival duration of the overseas subsidiary; and if the risk ratio is equal to 1, then this variable has no effect on the survival of overseas subsidiaries.

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4.2 Full-sample empirical results and discussion

(1) Result

Table 6 shows how the degree of host country network integration affects overseas companies' survival performance. The host country's network integration density had a significant negative impact on each company's overseas survival (risk ratio = 4.476 > 1, p< 0.001); thus, Hypothesis 1 is supported.

Table 6

Survival	Model 1	Model 2	Model 3	Model 4	Model 6	
ND		1.499 (0.430)		1.507 (0.439)	2.005 (0.539)	
		4.476***		4.513*	7.426***	
			-0.551	0.218	-1.288	
NB			(1.811)	(2.125)	(2.750)	
			0.576	1.243	0.276	
	-0.497	-0.365	-0.492	-0.366	-0.368	
Mode	(0.198)	(0.200)	(0.199)	(0.200)	(0.206)	
	0.608**	0.694*	0.611**	0.693 **	0.692*	
	0.183	0.188	0.178	0.188	0.108	
EM	(0.400)	(0.407)	(0.400)	(0.407)	(0.413)	
	1.201	1.207	1.194	1.207	1.115	
	0.034	0.058	0.033	0.058	0.092	
Ln_p	(0.081)	(0.085)	(0.082)	(0.085)	(0.093)	
	1.035	1.060	1.033	1.060	1.096	
	-0.014	0.020	0.013	0.020	0.030	
PC_Age	(0.041)	(0.043)	(0.041)	(0.043)	(0.043)	
	0.986	1.020	0.987	1.020	1.031	
	-0.013	-0.009	-0.014	-0.009	-0.005	
TR	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	
	0.987	0.991	0.987	0.991	0.995	
					-1.020	
SOE					(0.739)	
					0.361	
ND×SOF					-1.734	
110 002					(0.945)	
					0.177*	
NB×SOF					2.999	
					(4.673)	
					20.057	
N	479	479	479	479	479	
-2 Log likelihood	566.702	553.509	566.608	553.498	548.474	
LR chi2	7.943(5)	20.992(6)	8.049(6)	21.001(7)	24.536(10)	
Statistics in parentheses *p<0.10, **p<0.05, ***p<0.01						

Empirical results of full sample*

Note: *The value in the first row is the regression coefficient; in the second row, the value in parentheses is SE; the value in the third row is Exp(B), which is the risk ratio. The risk ratio higher than 1 indicates that the variable is a risk factor.

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The breadth of the host country's network integration had a positive impact on each company's overseas survival (risk ratio = 0.576 < 1); thus, Hypothesis 2 is partially supported.

Government background significantly reduced the negative relationship between the host country's network integration density and the company's overseas survival (risk ratio = 0.177 < 1, p < 0.1), meaning that Hypothesis 3a is supported. Government background did not have a significant role in moderating the relationship between the host country's network integration and the company's overseas survival. Hypothesis 3b is not supported.

(2) Discussion

Although the network, as a driving force of the international expansion of multinational companies, was an important factor for companies to obtain overseas strategic resources, excessive network dependence could lock companies in a narrow geographic scope (Belderbos et al., 2013; lurko and Benito, 2018a), so that it is difficult for companies to deal with the complex and changeable competitive environment (Uzzi, 1996; Cantwell and Mudambi, 2005). With the deepening of host country network-integration density, the interaction between network partners will gradually solidify, making that the network space of the enterprises in the host country tends to be closed, and the channels for obtaining information tend to be narrow. Highly repetitive and limited information cannot accurately describe the full range of market conditions, and low information utilization efficiency will lead to deviations in the company's market judgment ability and make it impossible to accurately grasp market opportunities. On the other hand, an excessively high network integration density of the host country will make companies to rely excessively on existing paths and lock the company within the established framework, which will not only weaken the company's ability to develop new markets and new relationships, but also slow down the company's response to market changes. The resource effect of the host country networkintegration is insufficient to compensate for the negative impact of the excessive network integration density under these circumstances, which eventually imposed negative effect on the company's overseas survival.

With the increase in the host country network-integration breadth, the members in the network relationship will increase, the information and resources in the network will be more abundant (Rowley *et al.*, 2000). This helps companies obtain heterogeneous knowledge resources (Freel, 2000) and efficiently capture valuable market opportunities. And it can also help companies promote the co-creation of knowledge and resources through further resource integration, which has a positive impact on the companies in the host country is generally small. As one may see in Table 4, the average value of the host country's network integration breadth was only 0.0698, which may be the reason why Hypothesis 2 is not fully supported.

The degree of government participation is one of the main characteristics that distinguish emerging economies from developed countries in the overseas investment process (Kafouros & Wright, 2012). The study of Buckley *et al.* (2017) pointed out that the Chinese companies that lack ownership advantages faced the dual challenges of "outsiders' disadvantages" and "latecomers' disadvantages". However, the Chinese government may become a tie between companies and the host country government by connecting with host country government, enhancing the bargaining power of enterprises and reducing the risk of overseas survival of enterprises. In addition, companies with a government, such as

government subsidies, export tax rebates, low-interest loans, etc. (Buckley *et al.*, 2007; Rugman *et al.*, 2014). Such advantages offset the host countries' market risk, disadvantages of outsiders and other unfavorable factors to the greatest extent, improving the company's overseas survival ability. Government background did not have a significant role in moderating the relationship between the host country's network integration and the company's overseas survival, which may also be related to the relatively small data of the host country network-integration breadth.

4.3 Empirical results of grouped samples and discussion

(1) Result

In order to explore the heterogeneity of the host country's market environment, the research sample was divided into two groups - developed and non-developed - based on the host country's economic development level, and the mechanism between the host country's network integration and the company's overseas survival was explored further. Table 7 shows that the host country's network-integration density had a significant negative impact on the companies' overseas survival, thus supporting Hypothesis 1. Comparing Models 7 and 9, the risk ratio of the host country's network integration density in the developed countries was 7.783, which is higher than the risk ratio of the non-developed countries of 4.294, which is higher than 1. The negative effect of the host country's network integration density on the company's overseas survival was more obvious in the developed countries. The impact of subsidiary entry mode on enterprises' overseas survival was significantly positive in the developed countries group (risk ratio = 0.499 < 1, p < 0.05), but there was no significant impact on the survival of enterprises investing in non-developed countries. The entry mode was measured by the company's shareholding ratio in overseas subsidiaries. The interaction between government participation and host country network integration density was not significant in developed countries but had a significant positive effect on the overseas survival of companies in non-developed countries (risk ratio = 0.119 < 1, p < 0.1), supporting Hypothesis 3a.

Table 7

ender of groupod outline							
5	Develop	ed country	Non-developed country				
5	Model 7	Model 8	Model 9	Model 10			
	2.052	2.193	1.457	2.178			
ND	(0.753)	(0.810)	(0.600)	(0.808)			
	7.783***	8.961***	4.294**	8.829***			
	-1.988	-3.387	2.177	2.048			
NB	(3.889)	(4.365)	(2.710)	(3.642)			
	0.137	0.034	8.821	7.754			
	-0.695	-0.667	-0.159	-0.164			
Mode	(0.310)	(0.309)	(0.303)	(0.312)			
	0.499**	0.513**	0.853	.849			
	0.717	0.669	-0.242	-0.472			
EM	(0.630)	(0.642)	(0.584)	(0.607)			
	2.048	1.952	0.785	.624			
	0.192	0.196	0.065	0.067			
Ln_p	(0.165)	(0.169)	(0.111)	(0.188)			
	1.212	1.217	1.067	1.070			

Empirical results of grouped sample*

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Host Country Network Integration, Home Country Government Involvement

5	Develope	ed country	Non-developed country			
5	Model 7	Model 8	Model 9	Model 10		
	0.039	0.046	0.006	0.010		
PA	(0.070)	(0.072)	(0.063)	(0.062)		
	1.040	1.047	1.006	1.011		
	-0.099	-0.086	-0.009	-0.007		
Ln_TR	(0.116)	(0.122)	(0.023)	(0.023)		
	0.906	0.917	0.991	0.993		
		-0.249		1.667		
GI		(2.050)		(0.885)		
		0.780		5.297*		
		-0.607		-2.133		
ND×GI		(2.444)		(1.165)		
		0.545		0.119*		
		8.976		-1.402		
NB×GI		(10.678)		(5.448)		
		7914.829		0.246		
Ν	479	479	479	479		
-2 Log likelihood	224.953	223.867	253.354	263.239		
LR chi2	15.153(7)	16.376(10)	10.121(7)	13.164(10)		
Statistics in parentheses *p<0.10, **p<0.05, ***p<0.01						

Note: *The value in the first row is the regression coefficient; in the second row, the value in parentheses is SE; the value in the third row is Exp(B), which is the risk ratio. The risk ratio higher than 1 indicates that the variable is a risk factor.

(2) Discussion

Compared with non-developed countries, the market in developed countries has a lower fault tolerance rate. First, local companies in the developed countries are more competitive and generally occupied a larger market. Second, developed countries have attracted multinational companies from all over the world by virtue of the mature market systems and financial systems. The phenomenon of commodity homogeneity and price competition is more common, so the market competition is more intense in the developed countries. Companies should maintain a competitive advantage through a series of strategies such as improving product quality continuously, reducing production costs, and improving service levels. Companies with higher host country network-integration density generally have lower levels of information utilization and slower market response mechanisms, and could not survive with rapid market changes and fierce competition, which may be the reason why negative impact of the host country's network integration density was more significant in the developed countries. The breadth of host country network integration was not significant in either group, consistenting with the full sample. Besides, the entry mode was measured by the company's shareholding ratio in overseas subsidiaries. A high level of shareholding ratio means high right of control. Having higher control over overseas subsidiaries in developed countries helps companies to learn more mature management methods and advanced technologies, thereby enhancing their ability to survive in overseas markets. But this path is not effective in non-developed countries. This may be the reason why the entry mode is significantly positive in the sample of developed countries, but not in the sample of nondeveloped countries. In terms of government involvement, the reality showed that developed countries will introduce countervailing measures against enterprises in the emerging

economies. Moreover, the Chinese government's bargaining power with developed countries is relatively weak, and it cannot protect overseas companies operating in the developed countries. This may be the reason why the moderating effect of government involvement was not significant in the sample of developed countries.

In order to further explore the influence of the heterogeneity of the host country on the enterprises' overseas survival and the moderating effect of government participation, this paper draws the Kaplan-Meier survival curve in Figures 3-5. Figure 3 presents the impacts of host country heterogeneity on companies' overseas survival.

Figure 3

The K-M survival function diagram of enterprises based on host country heterogeneity



The figure comparing KM survival functions intuitively shows that no significant differences existed in the overseas survival of companies in developed and non-developed countries in the first five years of the company's overseas operations. After entering the sixth year, enterprises in developed countries had a significantly higher survival rate than those in non-developed countries did. The possible reason is that compared with markets in non-developed countries, markets in developed countries can provide enterprises with more advanced technologies and experience. On the other hand, developed countries' markets are sounder in terms of system, market environment, and financial system. At the same time, developed countries have less risk of political change and internal unrest, which is beneficial to business operations.

Figures 4 and 5 show the role of corporate heterogeneity (government participation) in moderating the survival of overseas companies in developed and non-developed host countries. The K-M survival function graph shows that in developed host countries, government participation had a positive effect on enterprises' overseas survival 2-4 years after their establishment. After the fourth year, the positive role of government participation disappeared, which had a negative impact on the companies' overseas survival. In the initial

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stage of enterprise establishment, the resource support and policy system support provided by the government can help companies offset the disadvantages of outsiders and have ample time to adapt to the market environment of developed countries. However, government participation may bring about outdated management methods and regulations in the middle and late stages of company development, making it difficult for companies to adjust market strategies according to the actual situation in time, resulting in inefficient use of resources (Singh, 1992). Therefore, parent companies with government backgrounds should avoid excessive intervention in the functions and strategies of subsidiaries (Wang and Qiao, 2017). In non-developed host countries, the negative impact of government participation on enterprises' overseas survival was more sustained.

Figure 4-5

The K-M survival function of enterprises based on the moderate effect of government participation (host country heterogeneity in developed versus nondeveloped countries)



Kaplan-Meier survival estimate (Developed country)

Kaplan-Meier survival estimate (Non-developed country)





A possible reason is that a joint relationship between the state-owned enterprise and the government often connect the enterprise's investment behavior with the state's will, which the media describe as "the threat of a great power." In non-developed countries with low levels of economic development, local business organizations and the public severely exclude foreign investment by state-owned enterprises due to concerns about market opportunities and employment.

4.4 Robustness test

The Schoenfeld residual proportional hazard test was used to verify the model's robustness and the core conclusions. Partial residuals were constructed for each variable, and their correlations with time rank were tested. If p > 0.1, the COX proportional-hazards assumption was established. Table 8 shows that the correlations between the partial residuals of all of the variables and the time rank were greater than 0.1, and their hazard ratios did not change with time, satisfied the Cox proportional-hazards assumption, and had good robustness.

Table 8

Schoenfeld Residual Proportional Risk Test Partial residual ND NB Mode EM Ln P PA Ln TR Rank of survival time 0.425 0.223 0.912 0.294 0.535 0.984 0.953

Conclusion and discussion

Based on the research sample of 213 Chinese listed companies from 2005 to 2015, this paper conducted an empirical analysis and tests on the investment data of 479 overseas subsidiaries involving 63 host countries (countries/regions). The density of the host country's network had a significant negative impact on the overseas survival of Chinese companies, while the breadth of the host country's network integration positively affected the overseas survival of Chinese companies. Overseas companies should expand the number of effective

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partners in host country's network in due course, increase the number of "nodes" in the host country network, reduce the host country network-integration density to avoid pathdependence traps while increasing the host country's network integration to maximize the positive effects of the host country's network and improve their survival performance. The intersection of government participation and host country network integration density weakened the negative impact of host country network-integration density on companies' overseas survival. In the sample where the host countries are non-developed countries, the role of government participation was consistent with the full sample, but the moderating effect of government participation was not significant in the developed country samples. Therefore, the government should provide timely policy support for overseas companies operating in non-developed countries, or improve the bargaining power of Chinese companies in overseas markets through communication with host country governments, helping companies overcome the disadvantages of outsiders and respond to overseas market risks. In the later stage of the companies' overseas operations (after the first five years), the survival rate of enterprises in developed countries was significantly higher than that of enterprises in non-developed countries. Therefore, based on the research in this article, companies should clarify their investment objectives (such as resource seeking, technology seeking, market seeking, etc.) before investing overseas in order to achieve longterm development, try to select developed countries as investment targets to improve overseas survival performance after comprehensively considering various factors.

The first contribution of this article is that it establishes the pathway between the embedding of the host country's network and the company's overseas survival from the perspective of binary relations, which breaks through the original research paradigm and provides new ideas for companies to improve their overseas survival capabilities. Secondly, this article details an in-depth analysis of the host country's network embedding, which was refined into two aspects - host country network integration density and host country network integration breadth - and clarified its specific concepts and measurement methods to fill the relevant theoretical gaps. Third, the article uses Chinese listed companies as its sample, which complements past theoretical flaws, in that most of the relevant studies discussing company survival from a network perspective used developed countries as their sample. Simultaneously, the moderating effect of government participation in terms of the enterprise's heterogeneity was considered, and the sample was divided into two groups developed and non-developed countries - according to the host country's economicdevelopment level for classification. This study provides a multi-angle, multi-level reference for the survival of overseas subsidiaries of multinational companies in the emerging economies and has important practical value. Fourth, through manual data collection, this article establishes a database of 479 overseas Chinese companies involved in 63 host countries (countries/regions). The article's empirical analysis of how the host country's network integration affects companies' overseas survival has high universality and provides data support to previous studies based on case studies and questionnaires.

Based on social network theory and enterprise network theory, this paper further improves the theoretical framework of "survival determinism of overseas subsidiaries" from the perspective of host country network integration, and provides theoretical basis on companies in emerging economies with better use of host country network resources and new advantages in international competition. However, there still are some limitations. First, the sample size is limited. This study selects only China's A-share listed companies from 2005 to 2015, and matches them with the "List of Overseas Investment Companies (Institutions)" issued by the Ministry of Commerce of China to obtain the final sample. However, Chinese

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non-listed companies and companies from other emerging economies are not included. It remains to be discussed whether the research conclusions can be generalized to other cases. Future research can expand the sample size, and explore the differences in the role of host country network integration on the overseas survival of different types of companies from the perspective of enterprise heterogeneity. Second, research dimensions are limited to some extent. This article only explored the impact of the host country network-integration on the company's overseas survival without considering the host country's network structure and the company's position in the network (such as whether it is at the core node of the network) and other important factors. In the future, the role of different characteristics of the host country's network on the companies' overseas survival can be explored on the basis of this article.

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