A Study on the Effects of Dual Network Embeddedness on Organizational Learning and Internationalization Performance

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ABSTRACT
Knowledge is an endless resource as well as the key source of competitive advantage for enterprises. In the era of globalization with knowledge economy and network economy, the internationalization growth of enterprises is facing new challenges. Under such situations, an enterprise has to stress on the resource integration of internal network and reduce international business risks by developing the external network relationship to enhance the internationalization performance.

With on-site questionnaire distribution and collection, enterprises with export-oriented manufacturing in Shanghai, Jiangsu, and Zhejiang areas are distributed 400 copies of questionnaire in this study. Total 302 valid copies are retrieved, with the retrieval rate 75.5%. The research results are summarized as below. 1. Dual network embeddedness presents significantly positive effects on organizational learning. 2. Dual network embeddedness shows remarkably positive effects on internationalization performance. 3. Organizational learning reveals notably positive effects on internationalization performance. It is expected to apply the research results to the internationalization growth or transnational business development of enterprises, to enhance the strategic performance and financial performance, and to be the reference for research on network embeddedness and organizational learning.

Keywords: dual embeddedness of networks, explorative learning, exploitative learning, internationalization performance

RESEARCH BACKGROUND
Knowledge economy and network economy have become the distinctive features in the era of globalization. A lot more enterprises attempt to take international markets as the places for optimizing resource allocation and proceeding product competition in order to acquire larger development space and the motive for continuous development. The process of an enterprise establishing and developing network relationship in the international market and adjusting the network location is an internationalization process. Mattsson (1985) regarded 3 stages to complete the process, including 1.to develop the relationship among enterprises in the foreign market relationship.

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network for the expansion of internationalization business through the construction of relationship network location, 2.to enhance the resource commitment in the foreign market relationship network for the penetration into international markets through the development of relationship network location, and 3.to constantly coordinate the network location in the market relationship network among various countries for the integration of global strategic resources.

China has been “bringing in” the active participation in globalization to become a beneficiary country in the economic globalization process. Nevertheless, such passive internationalization could no longer adapt to new situations. The internationalization of enterprises in China is now changing the “bringing in” strategy into the “going out” strategy with active global Internet embeddedness. Network embeddedness is the source of market opportunities for an enterprise acquiring international market knowledge and internationalization operation knowledge through global market network embeddedness. The mechanism to cultivate such an ability of internationalization growth indeed is the learning mechanism of an enterprise. Early theory of internationalization considered the internationalization of an enterprise as a progressive learning model and risk aversion. An enterprise, through mobile learning, would acquire the experience and knowledge required for internationalization to further guide the enterprise acquainting target markets and selecting reasonable entry models (Johanson & Vahlne, 2006). New theory of internationalization, on the other hand, indicated that an enterprise would actively embed into the global market network to acquire information and develop the creative component of resources for promoting the internationalization performance (Chetty & Holm, 2000). Therefore, the effects of dual network embeddedness and organizational learning on internationalization performance are discussed in this study. The research results are expected to be applied to the international business development of enterprises, to enhance the internationalization performance, and to be the reference for research on network embeddedness.

**LITERATURE REVIEW**

**Dual network embeddedness**

Polanyi first proposed the idea of “embeddedness” to explain the effects of non-system factors and non-economy factors in human economy (Karl, 1957). Halinen & Tornroos (1995) regarded network embeddedness as the relationship or dependency between enterprises and various networks. The internationalization of an enterprise
was the process for constant global market network embeddedness. Johanson & Mattsson (1988) considered that the internationalization network model of an enterprise outperformed other internationalization models as a network model took the mutual dependency and development process of international markets into account. Meyer et al. (2011) studied subsidiary companies and indicated that a subsidiary company was embedded in the internal network formed by the parent company and other subsidiary companies as well as the external network formed with the host country. In other words, an enterprise could possibly embed into closely related dual networks in the internationalization process.

By combining the research of Meyer et al. (2011) and starting from the aspect of the internationalization of local enterprises, dual network embeddedness is divided into internal network embeddedness and external network embeddedness in this study. Such two layers are explained as following.

(1) Internal network embeddedness: Internal network embeddedness refers to the network formed by enterprises and domestic cooperative partners mutually sharing knowledge, resources, and technology, including the long-term trust and cooperation of network nodes and the mutual share of management and experiences.

(2) External network embeddedness: External network embeddedness often has the relationship with oversea customers, suppliers, and other partners as the carrier and is affected by such oversea market relationship, containing the width and depth of relationship among organizations.

Organizational learning

Knowledge is the basic factor in the internationalization model of enterprises proposed by Johanson & Vahlne (2006) that an enterprise has to learn knowledge to adapt to the complicated and changeable international market environment. Zahra & George (2002) referred organizational learning ability to an enterprise identifying and applying external knowledge to enhance the competitive advantage. Huang & Kao (2008) further defined organizational learning ability as an organization acquiring, absorbing, and transforming new knowledge and applying such knowledge to the development of new products. The idea of international learning is the development of knowledge management in a multinational corporate. Minniti and Bygrave (2001) indicated that the essence of international learning was an enterprise proceeding experiential learning, exploring new opportunities or solving problems in the internationalization management, and adjusting and developing the knowledge stock of the organization. Learning by observing others used to be a primary mechanism for the internationalization of enterprises (Bruneel et al, 2010). An enterprise could create more knowledge through the bilateral commitment with internationalization partners and the embedded network of cooperative partners that knowledge learning would create more opportunities for the internationalization of enterprises (Oviatt & McDougall, 2005).


(1) Explorative learning: Referring to the ability of an enterprise collecting, learning, and studying new knowledge, rather than accumulating existing knowledge, through the external relationship with customers, institutions, and suppliers (Noni & Apa, 2015).

(2) Exploitative learning: Referring to an organization, based on existing knowledge, learning and studying the organization flow with few changes through the recombination of information, resources, and knowledge, stressing on the slow change and reform of existing products or knowledge, and emphasizing efficiency, refinement, and practice (Li et al., 2013).

Internationalization performance

Performance is the standard to measure the achievement of goals of enterprises. Performance generally presents two meanings. First, it represents the efficacy and efficiency of an enterprise applying resources in the past. Second, it presents prospective influence to modify the past wrong business activity and point out the future
direction of resource allocation and long-term competitiveness to help enterprises understand the strategies and execution achieving the preset objectives. Shoman (1998) mentioned that the past research on internationalization performance focused on the export activity and export performance of enterprises, but rarely mentioned about the performance on other internationalization activities, such as direct foreign investment. Delios and Beamish (2001) considered that the internationalization performance of enterprises should be interpreted with multiple dimensions, i.e. to measure from several points of view. Masaaki, Srinidhi and Preet (2002) indicated that internationalization performance contained financial performance and production performance.

Referring to the classifications of Cavusgil & Zou (1994) and Knight & Cavusgil (2004), internationalization performance is divided into two dimensions of financial performance and strategic performance in this study.

1. Financial performance: Referring to international performance which could be viewed from financial statements, including the growth of overseas sales revenue, the pre-tax profit standard, and the growth of overseas return on investment.

2. Strategic performance: Referring to an organization presenting the international performance after a longer period of time, rather than from the financial statement, covering changes of target market share, enhancement of overseas customer satisfaction, and performance of major products.

Relationship between dual network embeddedness and organizational learning

Network embeddedness is a key factor in organizational performance (Andersson & Forsgren, 2002). However, it is controversial how network embeddedness affects performance. Early researchers (Granovetter, 1985) pointed out the positive effect of network embeddedness on performance, while the later research (Antonio, 2007) revealed the negative effect between embeddedness and performance. The internationalization of an enterprise is the process to constantly embed into global Internet that an enterprise could acquire the indirect knowledge or resources from other subjects by embedding the closely related dual network. Network embeddedness provides key information and joint for an enterprise finding out new business opportunities in foreign markets, mobilizing resources, and contacting invisible knowledge (Stuart & Sorenson, 2005). Andersson (1999) found out the positive correlation between the organizational learning ability of new knowledge information and the depth and strength of local network embeddedness of the subsidiary enterprise of a transnational corporation. Especially, the close relationship with leading customers allowed the enterprise timely acquiring the information of market needs as well as technology knowledge related to technology innovation (Shaw, 1991). Accordingly, the following hypothesis is proposed in this study.

H1: Dual network embeddedness would affect organizational learning.

Dual network embeddedness and internationalization performance

The behavior of internationalization encounters more risks and uncertainties that the internationalization process is the process of an enterprise acquiring, dealing with, and analyzing relevant knowledge and constantly removing uncertainties (Johanson & Vahlne, 2003). An enterprise with deeper network embeddedness would have larger opportunities for the growth, as the network members are joined that an enterprise increasing the network embeddedness would have the members enhance the interaction and the enterprise would have more exchange opportunities (Coleman, 1990). Besides, high-quality information in high network embeddedness could be rapidly spread (Uzzi, 1997) that the spread efficiency would be enhanced. An enterprise could rapidly respond to the market needs because of the mutual explanation of network members to further accelerate the internationalization process and promote the internationalization performance of the enterprise. In this case, the following hypothesis is proposed in this study.

H2: Dual network embeddedness would influence internationalization performance.
Relationship between organizational learning and internationalization performance

Knowledge is regarded as the key resource in the internationalization process of an enterprise (Oviatt & McDougall, 2005), and learning international market knowledge is essential for accelerate the internationalization process of an enterprise (Wach, 2015). Organizational learning ability therefore is a primary mechanism for the internationalization of an enterprise (Bruneel et al. 2010). The knowledge acquired from internal/external dual networks could be directly utilized by an enterprise, while a part of knowledge needs to be absorbed for transforming into the knowledge of the enterprise. Johanson & Vahlne (1990) also mentioned that the acquisition and absorption of knowledge in international markets could benefit an enterprise mastering the changes of international market needs, the competition development in international markets, and the policy development of the host country as well as reduce uncertainties in the internationalization process to promote the internationalization performance of the enterprise. From the viewpoints of network and organizational learning, Mathews (2006) further proposed the linkage-leveraging-learning (LLL) model and considered that enterprises with emerging economies acquired external resources through joint in the international expansion and updated the learning from the repeated linkage and leveraging effect to help accelerate the internationalization process. Zahra & Hayton (2008) also indicated that organizational learning ability could assist an enterprise in acquiring and utilizing new knowledge in foreign markets for the high performance. Enterprises with stronger organizational learning ability could acquire and absorb new concepts and methods and could more easily develop the learning advantage to further enhance the performance (Wu & Voss, 2015). The knowledge acquired from external networks could be directly utilized by an enterprise, but a part of the knowledge required a series of digestion, fusion, and integration. In other words, the knowledge acquired from networks needed to be absorbed by the enterprise to become the knowledge of the enterprise itself. As a result, the following hypothesis is further proposed in this study.

**H3**: Organizational learning would influence internationalization performance.

**RESEARCH DESIGN**

**Research framework**

Based on above literature review, the research framework is drafted to discuss the relations among dual network embeddedness, organizational learning, and internationalization performance.

![Figure 1. Research framework](image)
Measurement of variable

1. Dual network embeddedness
   Referring to the research results of Meyer & Mudambi (2011) and Larvie (2012), dual network embeddedness is divided into (1) external network embeddedness, and (2) internal network embeddedness.

2. Organizational learning
   Referring to the research results of March (1991), organizational learning is divided into (1) explorative learning, and (2) exploitative learning.

3. Internationalization performance
   Referring to the viewpoints of Cavusgil & Zou (1994), and Knight & Cavusgil (2004), internationalization performance is divided into (1) strategic performance, and (2) financial performance.

Research object and sampling data

Transnational corporations with export-oriented manufacturing are selected as the research subjects. Middle and top managers engaging in oversea businesses for more than 3 years are proceeded on-site questionnaire distribution and collection. The enterprise list is acquired from foreign trade authorities of above provincial and municipal governments from which 400 enterprises in manufacturing with international businesses are surveyed. Total 302 valid copies of questionnaire are retrieved, with the retrieval rate 75.5%. The retrieved questionnaire is analyzed with SPSS and AMOS, and the hypotheses are tested with reliability and validity analyses, Correlation Analysis, and Regression Analysis.

ANALYSIS RESULT

Reliability and validity analyses

Reliability refers to the internal consistency of the measured results. Cronbach α coefficient and CITC (corrected item total correlation) are commonly used for testing the reliability in Likert scale. The measured Cronbach α reliability of dual network embeddedness, organizational learning, and innovation performance shows 0.890, 0.799, and 0.826, respectively (Table 1), and the CITC value appears in 0.478-0.678, larger than the standard 0.35, that the questionnaire conforms to the reliability requirement.

To ensure the content validity of the scale, the formal scale has been preceded several times of pre-survey and discussion in order to ensure the questions being able to accurately reflect the essence of variables and the respondents not questioning the questions. In this case, this study presents good content validity. In regard to construct validity, AMOS17.0 is applied to precede the confirmatory factor test of the validity of the scale.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Standard factor loading</th>
<th>Reliability coefficient</th>
<th>Component reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>dual network embeddedness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>external network embeddedness</td>
<td>0.836</td>
<td>0.830</td>
<td>0.890</td>
</tr>
<tr>
<td>internal network embeddedness</td>
<td>0.870</td>
<td>0.803</td>
<td></td>
</tr>
<tr>
<td>organizational learning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>explorative learning</td>
<td>0.755</td>
<td>0.665</td>
<td>0.799</td>
</tr>
<tr>
<td>exploitative learning</td>
<td>0.740</td>
<td>0.744</td>
<td></td>
</tr>
<tr>
<td>internationalization performance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>strategic performance</td>
<td>0.819</td>
<td>0.755</td>
<td>0.826</td>
</tr>
<tr>
<td>financial performance</td>
<td>0.867</td>
<td>0.615</td>
<td></td>
</tr>
</tbody>
</table>
confirmatory factor analysis result reveals that the indicators appear in 0.5-0.95 and are larger than the standard fit 0.5, showing the construct validity of the model with better goodness of fit.

Correlation Analysis

The correlation among variables is the premise for Regression Analysis. All variables therefore are proceeded Pearson Correlation Analysis before Regression Analysis. The results, Table 2, show the remarkable correlation among external network embeddedness, internal network embeddedness, explorative learning, exploitative learning, strategic performance, and financial performance that H1, H2, and H3 are preliminarily confirmed.

Regression Analysis

(1) Regression Analysis of dual network embeddedness and organizational learning

To test H1, the analysis results, Table 3, reveal significantly positive effects of external network embeddedness ($\beta=0.215^{***}$) and internal network embeddedness ($\beta=0.447^{***}$) on explorative learning and notably positive effects of external network embeddedness ($\beta=0.350^{***}$) and internal network embeddedness ($\beta=0.341^{***}$) on exploitative learning that H1 is supported.

(2) Regression Analysis of dual network embeddedness and internationalization performance

To Test H2, Table 3, the analysis results present remarkably positive effects of external network embeddedness ($\beta=0.293^{***}$) and internal network embeddedness ($\beta=0.521^{***}$) on strategic performance and significantly positive effects of external network embeddedness ($\beta=0.431^{***}$) and internal network embeddedness ($\beta=0.450^{***}$) on financial performance that H2 is supported.

(3) Regression Analysis of organizational learning and internationalization performance

To test H3, Table 3, the analysis results appear notably positive effects of explorative learning ($\beta=0.403^{***}$) and exploitative learning ($\beta=0.429^{***}$) on strategic performance and remarkably positive effects of explorative learning ($\beta=0.416^{***}$) and exploitative learning ($\beta=0.443^{***}$) on financial performance that H3 is supported.

Table 2. Mean, standard deviation, and correlation coefficient of variable

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>External network embeddedness</th>
<th>Internal network embeddedness</th>
<th>Explorative learning</th>
<th>Exploitative learning</th>
<th>Strategic performance</th>
<th>Financial performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>external network</td>
<td>3.99</td>
<td>0.603</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>embeddedness</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>internal network</td>
<td>4.03</td>
<td>0.559</td>
<td>0.072**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>embeddedness</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>explorative learning</td>
<td>4.01</td>
<td>0.610</td>
<td>0.054**</td>
<td>0.059**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>learning</td>
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<td></td>
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<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>exploitative learning</td>
<td>3.91</td>
<td>0.557</td>
<td>0.059**</td>
<td>0.059**</td>
<td>0.055**</td>
<td>1</td>
<td></td>
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<tr>
<td>learning</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>strategic performance</td>
<td>4.06</td>
<td>0.538</td>
<td>0.067**</td>
<td>0.073**</td>
<td>0.063**</td>
<td>0.065**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>performance</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>financial performance</td>
<td>4.04</td>
<td>0.531</td>
<td>0.075**</td>
<td>0.076**</td>
<td>0.065**</td>
<td>0.067**</td>
<td>0.070**</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: ** stands for $p<0.01$, *** for $p<0.001$

Data source: Self-organized in this study
CONCLUSION

The research results reveal the positive and significant effects of dual network embeddedness and organizational learning on internationalization performance. It indicates that internal/external dual network embeddedness could help an enterprise enhance the explorative learning ability and exploitative learning ability to further enhance the strategic performance and financial performance. Several studies showed that network embeddedness, as the key condition of an enterprise learning knowledge, was the key success factor in the internationalization. For this reason, an enterprise could focus on developing oversea and domestic network resources to reduce and remove the costs and obstacles to the organizational learning and broadly understand the learning methods, in the complicated and changeable international business environment, to enhance the explorative learning ability and exploitative learning ability.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Organizational learning</th>
<th>Internationalization performance</th>
<th>Internationalization performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Explorative learning</td>
<td>Exploitative learning</td>
<td>Strategic performance</td>
</tr>
<tr>
<td>external network embeddedness</td>
<td>0.215***</td>
<td>0.350***</td>
<td>0.293***</td>
</tr>
<tr>
<td>internal network embeddedness</td>
<td>0.447***</td>
<td>0.341***</td>
<td>0.521***</td>
</tr>
<tr>
<td>explorative learning</td>
<td></td>
<td>0.403***</td>
<td>0.416***</td>
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<tr>
<td>exploitative learning</td>
<td></td>
<td>0.429***</td>
<td>0.443***</td>
</tr>
<tr>
<td>F</td>
<td>93.658</td>
<td>105.331</td>
<td>205.881</td>
</tr>
<tr>
<td>P</td>
<td>0.000***</td>
<td>0.000***</td>
<td>0.000***</td>
</tr>
<tr>
<td>R²</td>
<td>0.385</td>
<td>0.413</td>
<td>0.579</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.381</td>
<td>0.409</td>
<td>0.577</td>
</tr>
<tr>
<td>VIF</td>
<td>2.128</td>
<td>2.128</td>
<td>2.128</td>
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<tr>
<td>DW</td>
<td>1.585</td>
<td>1.731</td>
<td>1.744</td>
</tr>
</tbody>
</table>

Note: ** stands for p<0.01, *** for p<0.001, and VIF is the maximum variance inflation factor.
Data source: Self-organized in this study

SUGGESTION

Aiming at above research results, the following suggestions are proposed in this study.

1. Active internal/external dual network embeddedness: Under current economic globalization and network competition, the key in the continuous update of local enterprises within global manufacturing networks lies in the active internal/external dual network embeddedness. Specifically speaking, local enterprises should establish favorable relationship with domestic cooperative partners, actively integrate into local internal networks, and enhance the knowledge and technology transformation efficiency. Based on these, they should reinforce the exchange and interaction with oversea cooperative partners, acquire complementary resources with external strengths, and overcome the entry barriers to overseas markets.

2. Promoting organizational learning ability of local enterprises: Knowledge presents the obscure feature, is deeply planted in culture, and can hardly be imitated and learned that it is the key in developing
continuous competitive advantages. The managers are suggested to shape the culture beneficial for knowledge management, create dynamic and international learning environments, and form learning organizations or establish learning benchmarks for more positively and actively acquiring internationalization experience and knowledge. Meanwhile, enterprises are suggested to complete knowledge sharing platforms and sharing mechanisms, reinforce the identity, absorption, and digestion ability of new foreign knowledge, cultivate application and innovation abilities, and establish complete information management system, when necessary, for the support.

Thorough utilization of interpersonal relationship network among Chinese entrepreneurs: Enterprises in China have to borrow various domestic advantages and foreign power to “going out”, where oversea Chinese economy and Chinese entrepreneur network is an important power for the borrowing and utilization. It is suggested to highly concern about and actively participate in World Chinese Entrepreneurs Convention. On one hand, an enterprise could make friends through the beneficial opportunity and platform to search for ideal cooperative partners for “going out”. On the other hand, an enterprise could timely grasp business opportunities and facilitate the internationalization growth through information communication.

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