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External knowledge absorption in Chinese SMEs

Pi, L.

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Author: Pi, L.

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6 Conclusion and Discussions

In this chapter, we present the conclusions of the study. We start by providing answers to the RQs in Section 6.1. In Section 6.2, the answers to the PS is formulated and discussed. Then, we highlight the contributions of our study in Section 6.3. Both the theoretical and managerial implications of this study are described and discussed. In Section 6.4, limitations of the study are signaled. Finally, recommendations for future studies are given in Section 6.5.

6.1 Answers to the Research Questions

Our study tries to shed light on the topic by examining the issues of how SMEs absorb external knowledge, what challenges they may face in the knowledge-absorbing processes, and how effective different knowledge assimilation mechanisms are. Accordingly, three RQs have been raised:

RQ 1: *How do SMEs absorb external knowledge?*

RQ 2: *What challenges do SMEs face when absorbing external knowledge?*

RQ 3: *Which knowledge assimilation mechanisms do have an impact on the performance of SMEs?*

This section provides a summary of the answers given to the RQs. Subsection 6.1.1 summarizes the answers to RQ 1, Subsection 6.1.2 to RQ 2, and Subsection 6.1.3 to RQ 3.

6.1.1 External Knowledge Absorption in SMEs

According to Cohen and Levinthal (1990), external knowledge absorption entails three different processes: (A) external knowledge recognition (EKR), (B) external knowledge assimilation (EKA), and (C) external knowledge utilization (EKU). Therefore, the investigation of RQ 1: “How do SMEs absorb external knowledge?” is divided into three sub-RQs:

RQ 1a: *How do SMEs recognize external knowledge?*

RQ 1b: *How do SMEs assimilate external knowledge?*

RQ 1c: *How do SMEs utilize external knowledge?*

We conducted 16 in-depth interviews with owner-managers of Chinese SMEs in different industries. The interviewees were asked to answer 12 designed questions revolving around how their firms absorb external knowledge and their perceived challenges in the processes. The interviews were recorded and transcribed, and the texts of the interview were analyzed step by step by using content analysis techniques to arrive at the answers.

A: EKR Criteria

The RQ 1a is raised to examine how SMEs recognize the value of potential external knowledge before they decide to absorb it or not. Cohen and Levinthal (1990) define AC as organizational learning processes in which recognition is its first sub-process before knowledge assimilation and utilization. This study tries to find out what specific evaluation criteria SMEs often use to recognize potential external knowledge. It is found that the interviewed SMEs recognize potential knowledge candidates with three evaluation criteria: (A) the potential of external knowledge to meet internal needs, (B) expected costs involved in the knowledge absorption processes, and (C) accessibility to the knowledge sources.

B: EKA Mechanisms

Once SMEs decide specific knowledge may hold value to them, they may start to assimilate it. RQ 1.2 is designed to investigate what mechanisms SMEs may adopt to absorb potential external knowledge. This study looks at both organizational and individual-level knowledge absorbing mechanisms. In the end, five EKA mechanisms used frequently by SMEs are identified, which includes (A) consulting personal networks, (B) purchasing products or services, (C) referring to free sources, (D) recruiting new talents, and (E) collaborating with value-chain partners such as suppliers and customers.

C: EKV Purposes

This study defines “utilization of external knowledge” as “to use external knowledge for a practical or particular purpose”. Hence, our investigation of RQ 1.3 is focused on what the purposes of utilizing external knowledge are in SMEs. We found that external knowledge is mainly used by SMEs to (A) improve an existing product or service, (B) solve urgent problems that existing internal knowledge cannot solve, (C) reduce internal time costs, (D) reduce internal financial costs, and (E) concentrate internal resources and expertise on core business areas.

6.1.2 Challenges in Absorbing External Knowledge

The investigation of RQ 2 focuses on unveiling the challenges that Chinese SMEs face when absorbing external knowledge. We conducted 16 in-depth interviews with owner-managers of Chinese SMEs in various industries. The study identifies seven main challenges SMEs may face when absorbing external knowledge. We categorize them into two groups: (1) internal challenges and (2) external challenges. Five internal challenges are identified as (A) lack of resources, (B) limited internal expertise and competencies, (C) lack of social capital, (D) lack of reputation, and (E) negative attitudes against external knowledge. Two external challenges are listed as (A) issues with contracts and (B) a weak appropriability regime.

6.1.3 Effects of Different External Knowledge Assimilation Mechanisms

RQ 3 concerns whether different EKA mechanisms identified in Subsection 3.4.2 may have an effect on SME performance. We adopted a quantitative research approach to test the potential effects of five EKA mechanisms on the performance of SMEs. We designed a survey to measure the intensity of each of the five EKA mechanisms and their overall performance of the surveyed SMEs. Both financial and growth performance was measured. We made the hypotheses accordingly and tested them with linear regression analysis using the statistical package for social science (SPSS). The analysis is based on a sample of 221 SMEs from different industries and areas in China.

The results of our linear regression analysis suggest that the hypotheses that EKA through (A) recruiting new talents and (B) referring to free sources have positive impacts

on both the financial performance and growth of SMEs cannot be rejected. The effects of utilizing the other three EKA mechanisms, such as consulting personal networks, purchasing products and services, and collaborating with value-chain partners, on the SME performance must be rejected. Besides, the quantitative study also finds that different EKA mechanisms have a similar impact on both the financial performance and growth performance of SMEs.

6.2 Answers to the Problem Statement

We have formulated the following PS to set out the dissertation:

PS: *How do SMEs deal with external knowledge in order to improve firm performance?*

By answering the RQs, this study, by using evidence in China, adds our knowledge on how SMEs absorb external knowledge. Particularly, it sheds light on the specific processes and routines revolving around how Chinese SMEs absorb external knowledge. Based on the answers to the RQs, we can provide the following answers to the PS:

First, the study answers the PS by providing us a clearer picture of what sub-processes may be entailed in the evaluation, recognition, and utilization processes of AC in Chinese SMEs. Besides, it indicates how different AC processes may interact with and relate to each other (in SMEs and, probably, in larger firms too). By answering the sub-RQ 1.1, the sub-RQ 1.2, and the sub-RQ 1.3, we reveal what *criteria* Chinese SMEs use to recognize the value of external knowledge candidates, what *mechanisms* they often adopt to absorb intended external knowledge, and what *purposes* they have to utilize external knowledge. Based on the findings of different AC sub-processes, we suggest a dependent and iterative relationship between the three AC processes.

Second, our study highlights that SMEs absorb external knowledge differently from large firms. For instance, SMEs in our interviews express that (1) *lack of resources* and (2) *lack of internal expertise and competencies* are two of seven critical challenges they may face when they try to absorb external knowledge. Consequently, SMEs have to

choose EKA mechanisms that are relatively more economical and informal, as these mechanisms require fewer resources and management competencies. Large companies with relatively more resources and competencies will be more flexible in choosing their knowledge-absorbing strategies. It is evidenced by our finding that (1) *consulting personal networks* and (2) *referring to free sources* are two of the five important knowledge absorbing mechanisms in Chinese SMEs. R&D collaboration and mergers and acquisitions (M&A), which are essential knowledge absorbing strategies in large firms, are not usually adopted in Chinese SMEs.

Third, the study reveals that Chinese SMEs face unique challenges in the external knowledge-absorbing processes. The challenges they face are identified by answering RQ 2. *Five internal challenges* and *two external challenges* were recognized through interviews with Chinese SME owner-managers. The unveiled challenges highlight the costs and risks involved in the AC processes. The findings respond to the PS by unveiling the various challenges that SMEs face in the AC processes. The results also provide clues to what may cause the uncertain effects of AC on firm performance. They help us understand why different knowledge-absorbing strategies may have different performance implications on organizational performance.

Fourth, by answering RQ 3, our study provides empirical evidence that different approaches toward absorbing external knowledge have *different performance implications*. It emphasizes that SMEs shall choose the most suitable EKA mechanisms in order to improve their performance. Specifically, our study suggests that the two EKA mechanisms, (1) *recruiting new talents* and (2) *referring to free sources*, have positive impacts on both the financial performance and growth of SMEs. Therefore, it indicates that investing relatively more resources in the two EKA mechanisms could lead to better firm performance in SMEs. The findings answer the PS by providing managerial recommendations to SMEs on how to deploy their AC strategies better.

6.3 Contributions

In this section, we will discuss the theoretical and managerial implications of our study. Subsection 6.3.1 discusses the theoretical implications, and Subsection 6.3.2 describes the managerial implications.

6.3.1 Theoretical Contributions

This study contributes to the existing literature in three ways:

First, it unveils specific routines or practices under each dimension of AC. This study has successfully unveiled some specific processes and practices SMEs use when evaluating, assimilating, and utilizing external knowledge. By doing so, this study helps us see more clearly the differences between SMEs and big firms in how they absorb external knowledge. It supports the previous argument that SMEs operate differently than big firms because of their relatively smaller sizes, limited resources, and other associated characteristics. Such differences are reflected in the way how they absorb external knowledge (cf. Brunswicker and Vanhaverbeke 2015, Rippa *et al.* 2016). By specifying the routines and practices that constitute each dimension of knowledge absorption processes, this study enhances our understandings of the constituents of different sub-processes of the AC concept. Hopefully, this study will serve as a guide stone for more similar research.

Second, this study highlights an interrelated and iterative relationship between different dimensions of AC. Though most previous research treats knowledge absorption as including independent and successive sub-processes, our investigation indicates that these different sub-processes can be iterated and inter-related with each other. It is because learning itself is iterated and a process of experimenting, feedback, and evaluation (cf. Sosna *et al.* 2010, Winstone *et al.* 2017). For example, the cost concerns continue through each of the sub-processes. Firms are already estimating and foreseeing the costs in the EKA and EKU phases while they are in the first or recognition phase. The outcomes in EKA and EKU phases provide important feedback for a more precise evaluation of the intended knowledge. Before the intended knowledge is utilized in

practice, firms may not be able to appreciate how effectively it has been assimilated fully. These different phases could go back and forth several times until the new knowledge is appropriately valued and utilized.

These findings make us believe that it is necessary to rethink or adjust the way how AC has been treated in the existing literature, particularly those quantitative researches measuring AC with different dimensions reflecting independent processes. It is the primary reason we did not adopt the four-dimension concept of AC developed by some authors with quantitative methods. The result of the study suggests that it is more appropriate to conceptualize AC as including several iterative and interrelated dimensions or processes.

Third, the study's findings also improve our understanding of other research topics dealing with knowledge management in organizations, such as organizational learning. Organizational learning is deemed as a broader but closely related research field to AC studies. In this study, AC research is viewed as a branch of the organizational learning theory that focuses on knowledge transfer at the inter-organizational level. The specific AC sub-processes and practices revealed by this study also help us understand how knowledge is transferred between organizational boundaries as AC processes and knowledge transfer are closely related.

This study highlights an interrelated and iterative relationship between different processes of AC. The finding can be extended to organizational learning and inspires us to examine if relations between different processes of organizational learning. For instance, Argote (2011, 2012) conceives organizational learning as including three sub-processes: (1) knowledge creation, (2) knowledge retention, and (3) knowledge transfer. As different AC processes are interrelated and iterative, we may postulate that a similar relationship may exist between the three sub-processes of organizational learning. Whether and how these processes are related may be an interesting research topic for researchers in the organizational learning field.

6.3.2 Managerial Implications

The results of the study also have managerial implications.

First, it helps policymakers understand how SMEs deal with external knowledge and the challenges they may face, which provides fundamental knowledge for them to design policies to support SMEs' growth. Governmental policies play an essential role in facilitating knowledge sharing in society. SME-oriented public policies should be adapted to the specific needs of SMEs and provide support to them to overcome their difficulties. Before that, policymakers should understand how SMEs absorb external knowledge and what specific challenges SMEs may face.

For instance, knowledge residing in free sources is a "flow resource" that must be passed from one individual to another to have a higher value. Shared knowledge is beneficial to SMEs that rely on free sources for assimilating external knowledge. Although private companies are willing to share knowledge on open platforms for free, policymakers should design necessary technological and social infrastructures to encourage and facilitate such knowledge-sharing mechanisms. Many individuals and companies are cautious when sharing knowledge on open sources because they are afraid that their knowledge might be misused and concerned about whether their rights can be protected. A better-designed system is needed to ensure that they can retain copyrights while making their expertise or intellectual property available through open access (cf. Gillespie 2006, Dresel *et al.* 2020). Properly designed institutional measures may include stricter protection for secret knowledge and compulsory disclosure of knowledge in governmental or public organizations, creating open systems that facilitate transparency and access. By doing so, institutions can ensure that both privately owned and public knowledge can realize its potential value and help SMEs to access valuable knowledge more efficiently.

Moreover, this study also underscores the importance of recruiting new talents as a means of assimilating external knowledge. It has positive effects on the financial performance sides and as well as the growth performance of the SMEs. Although recruiting has positive effects on firm performance, SMEs often lack the resources and

the reputation to attract and retain skilled employees. Smaller firms also often lack the required organizational and relational assets to help newly hired employees realize their full potential. Hence, when policymakers design policies aimed at facilitating SME operations, they should pay attention to measures that can reduce the challenges faced by SMEs in their recruiting processes or enhance the overall attractiveness of SMEs for new talents. The findings of this study provide a list of practical challenges SMEs face when dealing with external knowledge. As utilizing external knowledge and enhancing AC is vital to SME performance, the identified challenges can help policymakers design more focused and specific measures to help SMEs better exploit external knowledge.

Second, the results of our study help managers in SMEs to better deploy their AC strategy with a performance implication in mind. This study indicates that the extent of utilizing specific EKA mechanisms, such as referring to free sources and recruiting new talents, has a positive effect on a firm's financial performance and growth. While valuable knowledge resides in various networks and sources, companies have to adopt various mechanisms to obtain new knowledge. However, these different EKA mechanisms may involve different costs, require a different extent of managerial attention, and lead to different performance implications. Hence, managers in SMEs need to carefully choose their strategies to get access to external knowledge and select the most effective mechanisms to help improve their firm performance. Our study helps managers to understand which EKA mechanisms may have a positive effect on firm performance. Based on that, they can wisely prioritize effective ones to improve management efficiency.

6.4 Limitations

Though we have taken reasonable precautions to ensure the reliability and validity of our study, this research is subjected to several limitations. The limitations stem mainly from two aspects: (1) the methodology and (2) the sample and data collection. Methodological limitations are mentioned in subsection 6.4.1. Subsection 6.4.2 describes limitations related to the sample and data collection.

6.4.1 Methodological Limitations

First, the interview as a research approach has its limitations. We use the in-depth semi-structured interview as the primary approach to answering RQ 1 and 2. The semi-structured interview allows us to unveil hidden topics that are hard to notice by other research methods such as a survey. However, the reliability of the respondents' answers in interviews is often questionable as they are highly subjective. For instance, the interviewees may not be willing to reveal the real answers to the interviewers. They may provide only answers that they deem correct or what they think the interviewers want to hear. The sample size of interviews is often limited, as conducting interviews usually consumes more time and costs than other approaches such as a survey.

Second, to answer RQ 3, we use linear regression analysis to test our hypothesis. The linear regression analysis itself is subject to limitations. It assumes that a linear correlation exists between the dependent variables (viz. *firm performance*) and independent variables (viz. *different EKA mechanisms*). Though we believe using linear regression is reasonable because our focus is on testing only whether different EKA mechanisms have an impact on SME performance, the assumption may not hold as a non-linear correlation may exist. The scatter plots between different EKA mechanisms and SME performance based on current data indicate that the assumed linear relationships are not pronounced (see Appendix 4). So, future studies can be extended to test possible non-linear relationships between the different EKA mechanisms and SME performance.

Third, besides EKA mechanisms, many other factors may have an impact on firm performance too. By omitting other variables, we assume that the impacts of various other factors on firm performance counteract each other. Their overall impact on firm performance is zero as a whole. Alternatively, these factors should be independent of the five EKA mechanisms. Otherwise, the omitted variable bias may occur, which will cause incorrect estimation of how much the dependent and independent variables correlate with each other. Though we include *firm size* and *firm age* as two control

variables, to include more control variables may help to minimize the bias of omitting other factors on the validity of the regression analysis.

Fourth, the linear regression analysis is often used to establish a correlation between independent and dependent variables but not necessarily a causal relationship. The two EKA mechanisms (viz. *recruiting new talents* and *referring to free sources*), which are tested to have a positive impact on firm performance, may only be correlated with SME performance. For instance, based on our analysis, we suggest that utilizing *recruiting new talents* as an EKA mechanism may cause a better SME performance. However, this might not be true because the fact could be that a better SME performance actually causes SMEs to recruit more new talents. The mechanism of how the two EKA mechanisms impact SME performance deserves further studies.

6.4.2 Sample and Data Collection Limitations

First, the data size and measurement could be improved. Due to time and cost restrictions, we conducted 16 interviews in the qualitative research for answering RQ 1 and 2. Only 12 of them were fully transcribed and translated for analysis. The other four were only partially incorporated for analysis due to technical issues with the recording or the interviewees not focusing on the real questions in their answers. Though we took other measures to ensure the validity of our findings in the data analysis process, such as two researchers were involved in coding the interview text, increasing the number of the sample will further improve the validity of the research. And, we used self-reported data to measure the extent of SMEs utilizing each EKA mechanism and the SME performance in our quantitative study. Although previous studies have suggested that subjective measures have equal reliability as objective archival measures, it would be better to corroborate the study by measuring each variable in the model with archival data.

Second, the interviewees in our qualitative study are mostly connected with the researcher's alumni network. Selecting samples from the alumni networks allows us to have more open and in-depth communication with the interviewees, as trust and confidence having been built up through alumni networks between the interviewer and

the interviewees. Nevertheless, the findings based on a non-random sample could be biased because the interviewed group shows some characteristics that are not representative of all the Chinese SMEs. For example, all the interviewees have attended higher education in China. The conclusions based on the sample may not represent many other SMEs in which the owner-managers have not attended higher education. The educational background of managers affects how they run their firms (cf. Gröschl and Barrows 2003, Bhagat *et al.* 2010, Loi *et al.* 2019).

Third, in the regression analysis, we collected only cross-sectional data of SMEs regarding their performance and measured EKA mechanisms. In practice, it takes time for any organizational practices or measures to materialize into organizational performance. Hence, our analysis is based on two essential assumptions: (1) cognitive preference of owner-managers for specific EKA mechanisms is the most critical factor influencing the operation and hence AC activities of the SMEs. (2) The cognitive preference is stable over time, and this preference translates into actions that increase firm performance. Although there are theoretical grounds to make such assumptions, these assumptions are the subject of debate.

Fourth, all our samples are from China. So our findings shall be interpreted in reference to their embeddedness in the Chinese context. Companies in different institutional, cultural, and economic settings may operate significantly differently when absorbing external knowledge and face different challenges in the process. The formal and informal institutions in China constitute the specific context of our study. The findings and conclusions we reach from the Chinese experience may have limited transferability to other countries with different institutions. For instance, Glisby and Holden (2003) critiqued that some knowledge management practices originated from Japan were not universally applicable to western nations and may not be of cross-cultural value. In the comparison study between China and Russia context, Latukha and Veselova (2019) found that talent management has an indirect positive effect on firm performance through AC. However, the effect is more robust in Chinese firms than in Russian firms within the link between AC and performance.

6.5 Avenues for Future Research

This study lays the groundwork for four potential research directions.

First, similar research could be conducted in the future by considering the limitations of this study and taking more measures to remedy them. For instance, future studies can use archival data, such as official data from the government on SMEs, to represent performance and consider the time-lag effects of different EKA mechanisms on organizational performance in the quantitative study. The quantitative study can also be enhanced by including other factors that may influence the SMEs' operations, such as employees and scientific institutes' behavior, as control variables. A larger number of and more diverse samples will help to randomize other factors that may also have an impact on firm performance. Such measures can improve the validity of our study and provide possible corroborating evidence to the findings.

Second, it would be interesting to investigate the same RQs, apply the same theoretical framework, and use the same research methodology to study big firms. By doing so, we can compare the differences in knowledge absorbing practices between SMEs and their bigger counterparts. Most existing studies either do not separate SMEs from big firms or focused mainly on big companies.

Third, more similar studies of AC of SMEs in different cultures and eco-systems would allow us to compare how such macro-backgrounds may influence SMEs' behavior when absorbing external knowledge. This study only provides direct evidence of how Chinese SMEs absorb external knowledge against the China context. Our study provides a base for comparing how Chinese SMEs absorb external knowledge with SMEs in a foreign context. Comparative studies of AC processes in firms of different cultures and eco-systems are still rare. Such studies in the future may help validate the applicability and transferability of our findings to different countries.

Fourth, though we examined all the three dimensions of AC as to what sub-processes or routines it consists of against the context of Chinese SMEs, our quantitative study only tested how different EKA mechanisms may influence SMEs' performance. How

external knowledge is recognized and utilized may also have an impact on firm performance. Future work can also consider testing the effects of other AC dimensions, such as EKR and EKU, on SME performance. For instance, the qualitative study shows that SMEs utilize external knowledge mainly for five purposes: (A) improving existing products or services, (B) solving urgent problems, (C) reducing time costs, (D) reducing financial costs, and (E) concentrating internal resources and expertise. Accordingly, in the future, we may investigate whether different purposes of utilizing external knowledge may influence firm performance. An exploratory regression analysis was conducted to test the relationships between different EKU purposes and firm performance (see Appendix 5). The preliminary result shows that EKU for *saving financial costs* has a positive effect on SMEs' financial performance. EKU for *concentrating internal expertise and resources* and *saving financial costs* also have positive effects on the growth performance of SMEs. The result of the explorative study indicates that future research that looks into whether different AC sub-processes or AC dimensions might make a difference in the firm performance may bear fruits.

After these four specific future avenues, we would like to conclude the thesis on the AC of SMEs with more evidence from China. Our findings are based on <https://adgchina.co/wp-content/uploads/2021/01/ADG-China-Solutions-Overview.pdf>. There it is highlighted that an interrelated and iterative relationship between different sub-processes of AC should be developed. Moreover, it is a pleasure to read and that these sub-processes are closely linked to SME performance. The Chinese SME development is of great interest to policy-makers and academics alike. We hope that our study will help to bring more attention of researchers to the AC of SMEs. More broadly speaking, we expect that data scientists in the future will learn and innovate in an environment full of uncertainties and opportunities.