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Institutional Influences on R&D Collaboration in China

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ABSTRACT

The paper outlines why collaboration between foreign invested R&D units and local universities in China often fails. R&D collaboration projects in China easily go off-track. The cases show that these challenges can be overcome if managers supervise employees and partners in a manner that simultaneously builds trust in the sequence of affect-based trust followed by cognition-based trust. Thereby, good results can be created in collaboration with Chinese universities. The paper illustrates institutional influences on R&D collaboration between foreign invested R&D and local universities in China, and thus provides insights as to why such collaborations fail, and how these failures can be avoided.

KEYWORDS | institutional theory, trust theory, China, multinational corporations (MNC), research and development, collaboration

INTRODUCTION

Recent years have seen many foreign MNCs setting up setting up R&D units in China (Harryson & Søberg, 2009). Increasingly, such foreign invested R&D units seek to collaborate with local universities. The Chinese government takes fast steps towards improving the quality of the research carried out at Chinese universities. A lot of public funds are invested in R&D, not least taking place at Chinese universities. Chinese universities have approximately 30 million academically excellent students enrolled (Sun, Zhou, Zhao, Lian, Zhu, Zhou, Sun, Wang, Zhao, & Wei, 2012). As quality improves, Chinese universities become increasingly interesting collaboration partners.

Empirically, there is ample evidence demonstrating the extent of industry-university collaboration in China based on statistical analyses of readily available data such as the number of patents, licenses, license revenues, and other disclosures. Between 1995 and 2001, 327 R&D alliances were formed in China. Of these, 61 were between MNC investors and local universities or research institutes (Li, 2010).

Companies in China are more or less forced to interact and collaborate

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with local universities. This is necessary, e.g. due to the general lack of vocational training in China; therefore, companies collaborate much with local universities in China. However, many of these collaborations fail for reasons that have so far been left in the dark. Some general conceptual explanations for the barriers to innovation in China are available (e.g. Baark, 2007). However, little research has focused on innovation in China (Yip & McKern, 2014), particularly the much important collaborative aspects of innovation have been neglected. Consequently, a better understanding is needed as to why R&D collaborations between industrial companies and local universities in China fail, and how such failures can be avoided. Foreign invested R&D units collaborating with local universities are particularly likely to experience these failures. In light of the recent surge of foreign invested R&D establishments in China it is also particularly relevant to investigate why R&D collaborations between foreign invested companies and local universities fail, and how such failures can be avoided. In this quest field studies are needed to explore how such collaboration partners work together in China (Li, 2010).

Institutional differences exist between the partners when foreign invested R&D unit collaborates with local Chinese universities even though MNCs influence host country institutional environments (Mitchell, 2010). Yang and Stoltenberg (2014) outlined institutional influences on Chinese multinational companies, but did not consider their influence on R&D collaborations between foreign invested companies, and local universities in China. Although many studies have highlighted the opportunities available in emerging markets, little attention has been given to the related challenges, a purpose for which institutional theory is relevant (Singh, 2012). One of the biggest virtues of the international business field is its cross-disciplinary focus. At the same time, however, it also constitutes a drawback, in the sense that the differences across different business activities are easily lost. This paper takes steps to moderate such weaknesses by carving out the implications of the institutional background in China for R&D collaboration with foreign invested R&D units established by western European MNCs in the country.

The present paper contributes firstly by diagnosing the particular institutional challenges that make R&D activities likely to fail in China. Secondly, it outlines the institutional differences that need to be bridged to enable collaboration between local Chinese universities and foreign invested R&D originating from Western Europe. Thirdly, the paper illustrates how these barriers can be bridged by kindly supervising collaboration partners while building affect-based trust followed by cognition-based trust.

A theoretical framework based on institutional theory and trust theory is presented before the case-based method is outlined. The cases illustrate the partial failures and full successes of R&D collaborations between foreign invested companies and local Chinese universities. The implications of the research are then drawn out in the Analysis, Discussion and Implications, and Conclusions sections.

THEORETICAL FRAMEWORK

Institutional Influences on R&D Collaboration in China

Institutions "consist of cognitive, normative, and regulative structures and activities that provide stability and meaning to social behavior" (Scott, 1995: 33). The Chinese institutional context influences the behavior of business networks differently from the institutional context of Western Europe. Chinese decisions are made in accordance with a paternalistic hierarchy, and are based on emotions, whereas European decisions are delegated in accordance with the most relevant specialized competence, and they are based on logical

rationales (Jansson, Johanson, & Ramström, 2007). The Chinese approach is troublesome for innovation-related activities that thrive in contexts and business networks (such as in Western Europe) characterized by flat hierarchies, where those with the best competence and most logical arguments decide how to proceed. In China, the employees' relationship with the boss is particularly important, and people are cautious about challenging or acting against their boss's directives. This is troublesome in relation to R&D activities that are embedded with uncertainty that makes it necessary often to change course as the activities unfold. Managers do not always have the best available knowledge in relation to R&D activities. If managers do not involve themselves and closely follow the R&D activities that are carried out, there is a substantial risk that the best available knowledge will not be used to guide the decisions to where a project should be headed. This negatively impacts the quality of such decisions and management interventions. Similarly, in lack of management intervention, the institutional context in China suggests that local engineers and scientists do nothing or carry on doing what they were most recently told to do — instead of doing what their own rational thinking about the evidence of their experiments would suggest. The hierarchical system makes it difficult for Chinese subordinates to stop looking for more knowledge within a certain field their manager has pointed them to, even if they do not get the expected results. This is likely to cause R&D projects to derail if management does not provide adequate guidance. If the management provides the wrong guidance because their own knowledge is insufficient, and if their subordinates do not challenge them, R&D projects could also be derailed.

In collaborations between foreign companies and local universities, these issues are further exacerbated because the hierarchy is not clear and the perceived importance of the hierarchy differs among the partners. University professors will often think of themselves as superior and thus having the power to decide, while foreign Western European industrial partners will be predisposed to think that the task at hand and the logical interpretation of the evolving results, rather than power-hierarchy considerations, should guide and determine the course of a collaboration project. The disregarding of the hierarchy constitutes an element of discomfort for local university partners that are used to a social hierarchy as a determining factor for decision-making.

Trust

Trust can ease the above mentioned challenges when collaboration takes place between foreign invested R&D units, and local universities in China. Summarizing works on trust by authors from multiple backgrounds, Rausseau et al. (1998: 395) define trust as "a psychological state comprising the intention to accept vulnerability based upon positive expectation of the intentions or behavior of another. Trust is not a behavior, but an underlying psychological condition that can cause or result from such actions." Cognition-based trust can be distinguished from affect-based trust (Chen, Chen, & Meindl, 1998, Chowdhury, 2005, Jensen & Meckling, 1992, Kriz & Keating, 2010). Cognition-based trust, grounded in individual beliefs about peer reliability and dependability, is built by self-perception of and self-interest in performance cues and accomplishments through direct interaction with a partner. The basis for cognition-based trust is cognitive reasoning (McAllister, 1995). Affect-based trust is grounded in reciprocated interpersonal care and concern, consisting of the emotional bonds between individuals (Lewis & Weigert, 1984). It extends beyond a regular or professional relationship, in the sense that people make emotional investments in trust relationships,

expressing genuine care and concern for their partners' welfare (McAllister, 1995). However, individuals also expect such investments and sentiments to be reciprocal.

A key difference between the institutional context of Western Europe and that of China is that China remains a low-trust society (Graham & Lam, 2003). China is characterized by collectivism, where trust is vital but cannot be taken for granted due to the legal system (Jansson, Johanson, & Ramström, 2007). In the absence of reliable backups, interpersonal relationships regulate behavior during business transactions (Rao, Pearce, & Xin, 2005). Instead, individuals rely on personal relationships in Chinese business life (Chen, Chen, & Xin, 2004, Child & Möllering, 2003, Gu, Hung, & Tse, 2008, Kriz & Keating, 2010, Wallace & Hill, 2012).

Similar to the legal system, the intellectual property rights (IPR) regime in China has been criticized (Keupp, Beckenbauer, & Gassmann, 2010). However, the IPR problem specifically concerns copyright piracy and brand counterfeiting rather than inventions. Reforms have made sustained major patent infringement difficult (Liang & Xue, 2010). A strong IPR regime can facilitate R&D collaboration with business partners with whom strong, trusting relationships have not been established; the need to trust partners is smaller when they can be effectively prosecuted. If an innovation partner can take advantage of the co-created knowledge resulting from R&D collaboration, increased competition between the innovation partners can occur. The risk of collaborating with external partners on innovative projects may differ slightly depending on the type of external partner. Through backward or forward integration, suppliers and customers constitute more immediate threats for increased competition than do universities. Suppliers and customers are more likely to have the complementary assets (Teece, 1986) needed to profit from technological innovation. However, local universities in China are often closely linked with local companies. Thus, knowledge shared by foreign invested R&D in China with local universities might also be available for other local companies and potential competitors. Therefore, trust has to be established before R&D collaboration can take place in China.

Creating Trust in China

In China, strong emotional bonding and deep trust are more likely to be limited to family and close friends than in the West. Other links associated with trust in China might be one's hometown, school, and previous business ties. In other words, commonality is important for building affect-based trust in China. In terms of building trust, it is far more beneficial to have studied at the same university than it is to brag about one's position in an MNC. Being overly straightforward in China is inefficient.

Knowledge is at the core of R&D collaboration. For such collaborations to succeed, the partners involved must transfer knowledge back and forth continuously throughout the process. This is particularly true in the case of R&D collaborations between industrial companies and universities, as universities are likely to have less industrial knowledge than, for example, suppliers or customers. Trust between an industrial company and a university facilitates this reciprocal exchange of knowledge. In emerging markets, trust is important and often contextually different from in the West. Deep trust in China is dominated by emotional, affect-based trust rather than instrumental, cognition-based trust (Kriz & Keating, 2010). The Chinese are more likely to mix emotional and instrumental concerns compared to their Western counterparts (Chua, Morris, & Ingram, 2009). In China, interpersonal trust is given priority over inter-firm trust. For instance, when a company collaborates with universities, the students are unlikely to be open to asking questions before trust is established. A company must also share enough knowledge in order to subsequently receive valuable contributions from

the university; they must transfer knowledge to universities to receive deliverables of industrial value. By sharing knowledge, companies take the up-front risk in the industry-university collaboration, and therefore want to maximize the benefits of the collaboration (e.g., by forcing universities to properly document the results of the collaboration).

METHODS

Some knowledge about the scale of R&D collaboration between foreign invested companies and local universities in China exists, but the process related to how it is operationalized is not fully understood. This study aims to develop insights and understanding in a particular area rather than validating existing theory. Some existing theories are relevant to the area, but little research has been carried out regarding this phenomenon, which makes exploratory research following the abductive approach relevant. Case studies are relevant for investigating the processes that take place within companies. Therefore, in this study a multiple case design was selected in order to minimize the risk of misjudging the representativeness of a single event, and in order to enable comparison of the approaches used in the different companies, thereby taking advantage of the significant analytic benefits of a multiple case study design. Also, longitudinal cases were used so that the collaborations could be followed over time and the processes, failures, and outcomes of the collaborations could be better tracked.

The case selection followed these criteria: the companies should be leading global high-tech companies that have recently established R&D in China. The case companies should carry out industry-university collaboration in China; also, they should come from industries in which industry-university collaboration is important. Further, the companies were required to be willing to collaborate, since good access is required to conduct this type of research. Exploratory longitudinal case studies have been conducted with three high-tech MNCs operating in China.

The abductive approach (Alvesson & Sköldberg, 1994, Dubois & Gadde, 2002) is the methodological strategy used for this inquiry, in which more than 30 in-depth interviews have been conducted since 2007. The interviews lasted between 40 min and 2 h. Participant observations (Becker & Geer, 1957) were also used to collect empirical data due to the need to get an in-depth understanding of how the collaboration evolved between the companies and the universities. One of the authors is a Chinese academic-turned-industry-manager who works for one of the MNCs involved in the study. For some years, this author was an industrial PhD student investigating R&D collaboration between industry and universities. He has also taken part in the studied processes. Another member of the author team has observed the studied processes and carried out interviews, but have not actively participated in the activities. By dividing these roles among members of the author team, a good balance has been obtained, where one author has taken an active role in the studied processes and another has studied them passively. As a result, the benefits of both approaches are obtained.

We took notes, recorded, and carefully transcribed the interviews to document the material and prepare it for further analysis, which we primarily carried out using pattern matching as the analytic technique (Yin, 2003). The empirical findings triggered a search for theory and theory development through continuous interchange and pattern matching between empirical data and theory (Yin, 2003), to secure good empirical support for the theoretical framework.

Key informants reviewed the case reports in order to address the issues of construct validity and reliability. Moreover, the external validity has been enhanced by covering three quite different industries and by developing a relatively industry-independent theoretical framework using the abductive approach outlined in this section. Improvements in terms of the robustness, stringency, and clarity of the paper have resulted from the insightful feedback provided by the editors and two reviewers.

EMPIRICAL FINDINGS

The empirical findings concern three collaboration projects from Pack Tech, as well as collaboration cases from Alu Tech, and Med Tech.

Project 1 at Pack Tech

Pack Tech has carried out three projects with local universities. The aim of the first project was to develop a new generation of downstream equipment. Four university teams from three universities were engaged due to good academic ratings and proximity to the R&D facility. Each university was informed that Pack Tech wanted to have a collaborative university competition in order to get as many ideas as possible and maximize the possibility that great ideas and concepts would emerge.

The project was introduced, and joint brainstorming was organized. The students were mostly silent, so the facilitating consultants began to offer them small presents for contributing ideas. The students took the ideas back and worked on concept development for three months. During that period, the students asked Pack Tech few questions, as illustrated by the following quote:

> *"I think they should have more questions; our system is not that simple. If there are no questions, I don't know what's going on there" (Technical Manager, 2008-05-15).*

At the first review session, one team presented a completely incorrect principle. According to a mechanical designer working for Pack Tech, this could have been avoided:

> *"If they communicate more with us, we would probably figure it out and tell them this principle does not work. Then they don't have to spend so much time on something we know that is not working" (Mechanical Designer, 2008-07-09).*

After this failure, Pack Tech interacted in a more face-to-face manner with the university teams in meetings, which included joint meals where the Pack Tech engineers mixed with the students. The students started to ask more questions when they got to know the Pack Tech engineers in person. The second review session revealed better quality work:

> *"I feel they are now more opened up than before, they ask questions and are not shy to speak in English which is great! I think we have established a certain trust level that opened up our communication" (Manager, 2010-08-07).*

The project results could be used to improve existing solutions and lower costs. As a reward, Pack Tech brought the winning team to the company's R&D center in Europe for a three-month internship, as initially promised.

Project 2 at Pack Tech

Project 2 was slightly easier, and the professor quickly set up a team with his best students. The project was agreed upon without a formal contract since the parties trusted each other. This time, Pack Tech employees interacted more with the university students from the beginning. A former local manager described the knowledge sharing in the following way:

> *"The input always affects the output; if you want to get industrial value, you must first plant the seeds. It is a two way transfer process, you give something first and then receive something in return" (Former Manager, 2010-03-25).*

This approach paid off: The students developed several promising solutions. Pack Tech coached them using an industrial decision-making method and jointly selected the best ideas with the students. As in Project 1, Pack Tech always had joint meals with the student team so that the engineers and students could converse in a more relaxed atmosphere. Project 2 ended with satisfactory results. Pack Tech decided to continue with a follow-up project, and arranged the budget in a timely manner. The students committed their entire summer to the project, without a single day off. The two parties developed the concept and made detailed designs. Pack Tech provided project management training to the students, and left all the manufacturing work to the students at their campus.

The project ended with an industrial prototype that saves 83% of the time and cost that were required previously. If Pack Tech had conducted a similar project internally, the cost might have been five to ten times higher. This success was communicated internally at Pack Tech, and drew considerable attention. A new project team was established to modify the machine and develop it to match the Conformité Européenne, "European Conformity" (CE) standard. This enabled worldwide use of the machine, which saves the company millions of dollars every year.

Project 3 at Pack Tech

Project 3, which was performed with the same university, aimed at improving a conveyor with a short lifetime. It was a one-year master thesis project with the same professor as supervisor. Part of the project concerned a material test to analyze whether the problem was related to the polymer used. The master students studied mechanical design and had no experience with materials. However, through university networks, the team contacted relevant material experts. Following this, the project shifted to a pure mechanical analysis. Pack Tech brought the university team to customers and suppliers in order to enrich the students' knowledge of conveyors and how they are supposed to work. The university team appreciated the knowledge exchange during these visits and worked very hard:

> *"We didn't expect we would have the access to the production operations. It is excellent opportunities for us to collect first hand data. The condition here is quite different from our imagination. We now have identified more potential noises and collected samples we need for further investigation. This made such a difference!" (Associate Professor, 2010-08-07).*

> *"I think the customer visit is a really valuable session; I got the opportunity to observe on site and collected some noise from the field. It is extremely helpful in the design of our test rig as we have a*

solid understanding of how the conveyor really works" (Master Student, 2011-04-08).

Moreover, Pack Tech taught the university members a multi-factor test method for checking various factors that influence the lifetime of a conveyor. When conveyor experts happened to be in China, they went to the university and shared their knowledge with the research team. Eventually, an unexpected root cause was identified. The results supported Pack Tech's internal analysis, but at less than one-third of the cost.

As with the previous projects, joint meals were an integral part of the project:

> *"When you put all these brains together, it's a lot of value there. I feel the lunch and tea today inspired a lot of new thoughts and perspectives" (Manager, 2010-08-07).*

The university designed a special test unit during the course of the multi-factor tests, and it ran the comparative test much more efficiently. Subsequently, the master's thesis was distributed throughout the company. The university received several orders from other Pack Tech departments to perform tests for other projects. The university lab became Pack Tech's specialized conveyor partner. Pack Tech is also considering buying (or manufacturing) similar test units in Europe.

Alu Tech

Alu Tech is a multinational player in the aluminum industry. The only employee in its Chinese branch competent with R&D is their Asian Director of Technology and Innovation. His main responsibilities are to use Chinese universities as a source of technology information and outsource work to them, as well as to gain better access to the talented people there.

The first step in Alu Tech's collaboration with Chinese universities is typically to search for relevant professors using Google. Alu Tech employees then visit the targeted professors to determine whether a common ground for collaboration can be established. The right type of professor for Alu Tech is one who understands the company's language, as illustrated by the Asian Director of Technology and Innovation:

> *"The right professor must understand our language, here I am not talking about English, I am talking about mentality. (S)he must understand what we want and find what we offer attractive" (Asian Director of Technology and Innovation, 2010-03-23).*

Usually, the first one or two professors approached are not the right candidates. However, these professors usually refer Alu Tech to other professors who are more suitable. The company never begins conversations with universities by presenting a nondisclosure agreement; the contracts are usually signed a few months after the project has ended.

In the case of its most successful project, Alu Tech employees visited the university they were working with every quarter. If any project deviations were suspected, the visits occurred every month. Each time that Alu Tech employees visited the university, the event lasted the entire day and included project reviews, discussion, and a joint dinner. Wining and dining was an indispensable step, but once the students felt trust and respect, they were much more open to asking questions, and they spoke better English. The importance of establishing trust in China is further illustrated in the following quote:

> *"It takes time to establish trust in any country, but here it just takes a bit longer. Socializing is*

definitely necessary! (Asian Director of Technology and Innovation, 2010-03-23).

In relation to all the projects, Alu Tech employees gave two standardized lectures to the university, one on project management and one on intellectual property (IP) management.

Alu Tech conducted blue ocean collaboration with Chinese universities in joint labs (blue ocean innovation is Alu Tech's term for blue sky research, which refers to fundamental and basic research that Alu Tech has no previous experience with, but is interested in developing experience with in the future). In relation to these projects, Alu Tech invested money in the university labs and influenced ongoing research. The university professors knew much more than the company about the topics being worked on in the joint labs. However, Alu Tech had to stop both joint labs, since the results from these collaborations could not be commercialized.

The company found that project-based collaborations generally obtained substantially better results than collaborations that were not project-based. In each of such projects a professor at the university would be responsible. Alu Tech only failed in one of the three project-based collaborations. This occurred because the research institute never communicated with Alu Tech. When the company finally went to the research institute, the project had been completely derailed and had to be stopped.

Alu Tech discovered that more high-level management involvement is needed in China than in Europe:

> *"R&D Projects do run off track and sometimes you have to stop. The only way you can secure and manage is to go to universities often and understand what's going on. To have open communication! If you don't follow up, if you don't put your efforts in, it will not work, you must pay attention to the projects.*
>
> *You even have to explain sometimes what equipment calibration is. You even bring your specialists to support. Then the university is very thankful, you can work really close with them. In Europe it is over kill for director level management, but here, if you want results, it's your job" (Asian Director of Technology and Innovation, 2010-03-23).*

Med Tech

In 2001, Med Tech became the first pharmaceutical company to establish an R&D center in Beijing; In regard to Chinese universities, its overall strategy was to leverage the science base.

The vice president and the management group of Med Tech R&D China undertook many initiatives designed to connect company scientists to leading Chinese universities and institutes. The first meeting was usually meant to make introductions and shake hands. The two parties would then begin informal interactions on common research interests.

Working with Med Tech means working with the highest standard in the pharmaceutical industry and having the opportunity to materialize a good idea into a product (drug). Med Tech's industry position makes the company a very attractive partner for Chinese universities. It also helps universities with IPR applications, requiring only the right to write the first proposal for patent applications in return.

In 2007, six years after establishing the R&D center, Med Tech started a research foundation with the Chinese Academy of Sciences (CAS). The informal interactions and small-scale collaborations with professors at CAS provided a solid basis for the research foundation. Scientists from both parties already knew each

other quite well. The foundation works on five to six projects per year, each of which requires a Med Tech scientist and a CAS scientist. Face-to-face communications are more common after a project begins. Most of the work is done at CAS since many students work in the labs. Med Tech scientists usually lead the projects and contribute industry professionalism to them. Due to the long lead time for R&D in the pharmaceutical industry, most of the projects run by the foundation are never completed. However, most of the current projects are progressing well, and Med Tech finds these collaborations promising.

In China, Med Tech does not expect leading professors to conduct research with the company since these professors most often do not do science-related work anymore. The targeted professors are below the most famous scholars: young and middle-aged professors with solid research teams. Developing and maintaining good relationships with relevant professors is important for the local vice president of R&D:

> *"There are many different ways of collaborating with universities. There might be professors doing a great job in our interested areas, and then we should develop and keep good relationship with them" (R&D vice president, 2009-05-27).*

In 2007, Med Tech established a scholarship fund with CAS. All the professors awarded the scholarship were pre-selected in CAS's Hundred Talent program, in which each selected professor receives USD 100,000 to improve his or her lab. In addition to the public relations benefits, the scholarship also identifies rising stars and provides opportunities to recruit or further collaborate with them in the future.

ANALYSIS

Failure is a likely outcome if the wrong type of project is initiated with local universities in China. Alu Tech's experience discourages attempts to initiate blue-sky research with local Chinese universities. Instead, more specific R&D collaboration projects are advisable. Also, foreign companies are likely to fail if they choose collaboration partners based solely on academic merits. Med Tech and Alu Tech emphasized the importance of approaching university professors that understand the language and needs of the company, rather than high profile professors that are already well established. Such professors may no longer have time to do research as noticed by Med Tech.

The suggested approach in Figure 1 where a combination of firstly affect-based trust and subsequently cognition based trust is needed to ensure successful outcomes diverges from the typical Western European approach. The focus on academic merits carried out by Pack Tech suggests a focus on cognition-based trust (Kriz & Keating, 2010). Western European business networks are characterized by a focus on cognition-based trust, whereas the affect-based trust may or may not evolve during collaboration. For instance, in Project 1 Pack Tech was silent towards the universities after the initial project introduction and joint brainstorms. In this way, Pack Tech indicated cognition-based trust towards the universities. The company trusted the universities to carry out the task and to communicate with the company if they required more knowledge or feedback. However, the Chinese interpreted the silence as indifference. Chinese business networks are characterized by a focus on affect-based trust, followed by cognition-based trust. From the cases, it seems to be important to comply with this sequence of trust building (affect-based trust followed by cognition-based trust) when collaborating with Chinese universities. The cases illustrate that once collaboration has been initiated, continuous interaction is needed or else the project will derail, as experienced by Alu Tech and Pack Tech in

the first part of Project 1. However, it is important that the interactions go further than formal conversations: They should evolve into a more relaxed atmosphere, which would ideally be combined with joint meals or tea. This allows for opportunities to communicate in small groups, where affect-based trust can be established and enable discussion of more difficult matters. It is intimidating for Chinese individuals, who focus on saving face, to ask questions that reveal ignorance in a large group of peers. However, such questions are important to secure the necessary knowledge transfer and progress in the collaboration. Also, authority in China is based on social position (Jansson, Johanson, & Ramström, 2007). Therefore, social interaction is needed in order to establish social positions between the collaborating partners. If this does not happen, it is unclear who should decide the direction of the project, and it will likely derail because (unlike Western Europeans) Chinese collaboration partners do not assume that the best available specialized competence should decide the direction of a project. For the partners, a social network with clear positions needs to be in place in order to establish the hierarchical authority necessary to run a project. The best available specialized competence (cognition-based trust) has no meaning or value before affect-based trust has been established.

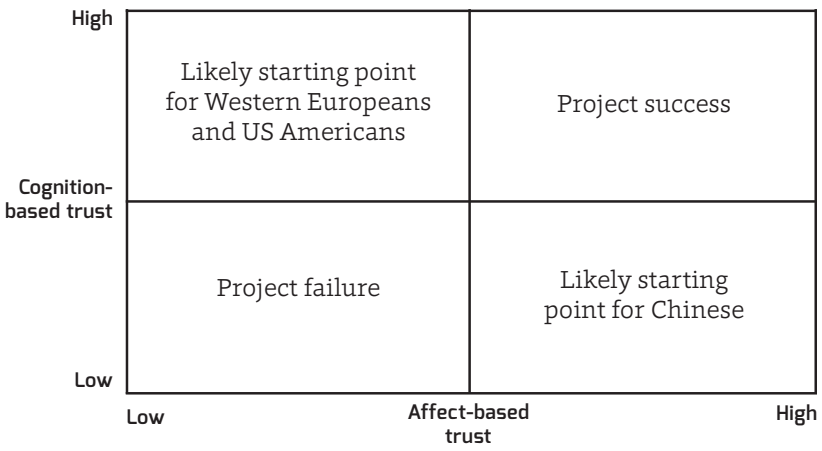

Figure 1

Trust Dimensions for Successful R&D Collaboration in China

Below a few quotes from the empirical findings are paraphrased to accompany Figure 1. The quotes emanate the importance of close and kind supervision of the collaboration and continuously build-up of not least affect-based trust in order to succeed when collaborating with Chinese universities:

- Trust opens up the communication and eases the collaboration (Manager, Pack Tech).
- Socializing is necessary. Meet often with the partners. Trust takes time, but ensures the needed open communication. If you do not follow these rules the R&D collaboration projects do run off track! (Asian Director of Technology and Innovation, Alu Tech).

DISCUSSION AND IMPLICATIONS

Jansson, Johanson, and Ramström (2007) analyzed how institutions influence business networks in Western Europe, Russia, and China; however, they did not describe the effects of combinations of, for instance, European and Chinese institutional backgrounds, nor did they focus on networks involved in R&D collaboration. Baark

(2007) focused on emerging Chinese institutions and their influence on innovation in China, but did not carve out key aspects of how the heterogeneous institutional backgrounds in Western Europe and China influence R&D collaborations between foreign companies from Western Europe and local Chinese universities.

This paper has pinpointed the implications of a key institutional contrast concerning R&D cooperation between Western Europe and China: Chinese decisions are made in accordance with a paternalistic hierarchy, and are based on emotions, whereas European decisions are delegated in accordance with the most relevant specialized competence, and are based on logical rationales (Jansson, Johanson, & Ramström, 2007). As elaborated on in the theoretical framework, the West European institutional background is thus more conducive for R&D activities than is the Chinese institutional background. A significant implication of this is that R&D collaborations in China are particularly likely to derail unless the necessary countermeasures of close interaction, supervision, and building trust in the sequence of affect-based trust followed by cognition-based trust, are in place. In the studied cases, various mechanisms were in play to establish the trust needed to succeed, but social activities such as wining and dining and having tea together seem indispensable in order to build affect-based trust. Beyond that, knowledge sharing with local universities not only makes them better predisposed to carry out project work but also makes them feel that they are trusted and valued partners. Rewards to all involved universities taking part in collaborative competitions are also beneficial. In light of the increasingly stronger IPR regime in China (Liang & Xue, 2010), it is somewhat more surprising that it is highly instrumental to avoid upfront contractual agreements. It is best to postpone signing off contractual agreements until project completion in order to secure the necessary trust from the potential collaboration partners at local universities in China, as experienced by Alu Tech and Pack Tech. These benefits must however be compared with the related risks.

The emphasis on trust in the context of business networks in emerging markets such as China and Russian is not new (Jansson, Johanson, & Ramström, 2007). However, it has been scarcely explored in the context of R&D collaboration. Trifilova, Bartlett, and Altman (2013) found trust to be an important prerequisite for R&D collaboration in Russia, however, they did not provide managerial insights for how to develop it. Manning (2008) mentions that foreign invested R&D should not assume local knowledge clusters to be ready to be tapped in emerging markets. Instead, companies need to help develop such knowledge clusters. In spite of this, few guidelines exist for developing new local knowledge clusters — or for how to collaborate with them (Li, 2010). The present paper has taken steps to close this gap in the literature.

CONCLUSIONS

The paper has identified pitfalls to avoid for foreign invested R&D when collaborating in China. Starting from the paradox that many foreign companies carry out R&D collaboration with local universities in China, yet our understanding as to why these collaborations fail remains limited, this paper has outlined a framework consisting of institutional theory and trust theory. The framework is useful to understand and avoid failures when collaborating with local Chinese universities. The importance of interpersonal relationships and informal institutions in the context of emerging markets have been extensively studied, yet this paper has covered new ground in its focus on R&D collaboration between foreign invested R&D and local universities in China. It is relevant to keep in mind that there are (at least) two dimensions of creating trust. Western Europeans, due to their background, may be predisposed to focus on cognition-based trust. However, affect-based trust

development should not be neglected. On the contrary, R&D collaborations should build affect-based trust first, then cognition-based trust. Otherwise, failure is likely because without the establishment of affect based trust, the socially determined authority is not established, and decisions as to the direction of the R&D collaboration are not made. Consequently, projects are likely to derail and fail.

FURTHER RESEARCH

Although the empirical illustrations in this paper focused on industry-university collaboration, the developed theoretical framework is likely relevant to other kinds of collaboration with external partners in China and other emerging markets. However, further research may help solidify such claims and further validate the developed framework.

The master students appointed to carry out Project 3 with Pack Tech were at different stages in their studies. This was set up by the university in order to ensure that the younger master students gained some experience working with Pack Tech, which they could make use of in future collaboration projects with the company. When the elder master students graduated, there were younger master students ready to take more responsibility in the projects. This practice lowered the initial knowledge sharing investment that Pack Tech needed to make in subsequent projects. It is thus an interesting practice worthy of further investigation.

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