

Performance implications of learning from joint ventures for local parent firms: Evidence from Russia.

Abstract

It has been long recognized that joint ventures (JVs) provide parent firms with an excellent opportunity for learning. This phenomenon is particularly interesting in transition economies, such as Russia, where local governments have promoted JVs establishment due to a belief that local firms can benefit from acquisition of foreign firms' technological and managerial knowledge. However, the JV literature to date lacks the empirical evidence of performance implications of learning from JV for local parent firms in transition economies and mainly concentrates on understanding of learning outcomes at the JV level. Thus, the paper aims to fill this gap and examines the performance implications of learning from JVs for local parent firms in Russian empirical context. The framework of the paper suggests that learning from JV affects the development of technological and managerial capabilities of Russian parent firms which, in turn, positively influences their restructuring and long-term competitiveness. The detail classification of technological capabilities is adopted from the innovation literature conceptualizing technological capabilities in several functions and levels and modified according to the research setting. Hence, this paper attempts to bridge the learning, innovation and strategy literature for the development of comprehensive measurements of JV learning at the parent level. The mixed research methods combining pilot survey with case study approach have been used to acquire reliable and rich empirical evidence for the purpose of this study. Main source of data were 3 manufacturing Russian JV parent firms which in total have established 5 JV with foreign firms. The research finds that, although upgrading took place in all functional types of technological capabilities as well as managerial capabilities, Russian parent firms upgraded production process capabilities to a largest extent which enabled to increase labor and capital productivity and to decrease production costs. These improvements in capabilities were perceived as being beneficial for speeding up the process of strategic large-scale restructuring and achievement of sustainable competitive advantage.

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1. Introduction

During last two decades the importance of knowledge based view has been increasingly emphasized in the scholarly research (Kogut and Zander, 1992; Nonaka, 1994; Teece, 1998). The central premise of this approach is that knowledge-based resources lie at the heart of competitive advantage of the firm and it is vital for firms to efficiently find an access to new knowledge (Conner and Prahalad, 1996; Grant and Baden-Fuller, 2002). Learning has been recognized as the most important mechanisms for augmenting knowledge base of the firms (Fiol and Lyles, 1985; Bell and Pavitt, 1995). Amongst various types and mechanisms of learning Joint Ventures (JVs) have been recognized as being an excellent platform for learning where parent firms have a close access to each other knowledge-based resources (Khanna, et.al., 1998; Inkpen, 2000). Theoretical studies emphasize that firms expect their JV partners to contribute knowledge-based resources in order to achieve the objectives of JV itself as well as to improve their own performance through the application of acquired knowledge for the development of new products, processes, and services (Hamel, Doz, and Prahalad, 1989; Hamel, 1991). However, the empirical evidence of the performance implications of learning through JVs at the parent firm level is scarce.

The phenomenon of parent firms learning through JVs has specific features in the context of transition economies. A radical upheaval of institutions and policies in the beginning of 1990s had a serious negative impact on the development of local firms (Peng and Heath, 1996; Roth and Kostova, 2004). The lack of domestic sources for knowledge acquisition necessary for upgrading of the local firms technological foundations has put an emphasis on foreign firms as a potential source of advanced technologies and managerial expertise. JVs have been assumed to be one of the most beneficial FDI modes due to a belief that they can provide local firms with an access to foreign firms' knowledge. However, although previous studies have found positive relationship between learning and JV performance (Lyles and Salk, 1996; Li, 2006), the impact of learning on local JV parent firms operations have not yet been investigated.

This research aims to fill this gap and examines the performance implications of learning from manufacturing JVs at the local parent firm level in Russian empirical context. The performance implications are assessed in terms of technological and managerial capabilities upgrading of

Russian parent firms as a result of learning from JV as well as the impact of this upgrading on Russian JV parent firms restructuring and competitiveness. Hence, this paper attempts to bridge the learning and strategy literature by the development of learning measurements and analyzing them in connection with firm strategy.

Russia represents a particularly interesting setting for the examination of this phenomenon. Despite presence of well developed R&D, technology infrastructure and strong technological competences in many industrial sectors prior to transition, Russia has failed to sustain technological capabilities and create a competitive firm sector in post transition period. The Russian economy provides an excellent illustration of an economy where system for knowledge creation and technological development is well developed, but fails to support the domestic industrial development after the start of the reforms. Thus, local government expects that foreign enterprises will assist this development and promotes creation of JVs.

In order to achieve the research objectives, the mixed methodology has been used. In particular, at the first stage of the research the pilot survey of 28 parent firms of manufacturing Russian-Western JVs was conducted to achieve the pre-understanding of learning from JVs and to make a selection of several Russian parent firms for their in-depth investigation on the basis of theoretically defined criteria. At the second stage, extensive qualitative data has been collected from 3 Russian JV parent firms by conducting personal interviews and analysis of extensive secondary data.

The remainder of the paper is as follows. Section 2 discusses the theoretical underpinning of the research. Section 3 presents theoretical framework. Section 4 describes in detail empirical methodology. Section 5 provides a short description of case companies. Section 6 presents results of empirical data analysis and Section 7 summarizes the most important findings. Finally, last section discusses main conclusions, contributions and limitations of the study as well as avenues for the further research.

2. Theoretical underpinning

2.1. Interorganizational learning

The acquisition of organizational knowledge is one of the most important priorities in organizations as it provides a foundation for the sustainable competitive advantage (Cohen and Levinthal, 1990; Nonaka and Takeuchi, 1995; Grant, 1996). Learning has been recognized as the mechanism how knowledge and capabilities are acquired, and it covers both aspects which are an access to new knowledge and capabilities and building on these knowledge and capabilities (Inkpen, 2000; Powell, et.al., 1996; Grant, 1996). Learning can take place within organizational and across organizational boundaries. In the given research the focus is on the interorganizational learning which is learning by a parent organization from a JV. Inkpen and Dinur (1998) distinguish three types of knowledge which parent can benefit from: (1) knowledge useful in the design and management of other JVs; (2) other firms' knowledge and skills, but not applicable /needed in their own operations; (3) knowledge which can be used by parent companies to enhance their own strategy and operations. The knowledge might be transferred to the JV by another JV partner, created in the JV in the course of its operations, or acquired in the process of interactions between JV parents in the course of cooperation.

Learning through JV is a multi-stage process (Inkpen, 2000). The first stage is the knowledge creation in JV, the second is the interaction between JV and the parent, or knowledge transfer from JV to a parent firm, and the third stage is integration and application of the transferred from JV knowledge in the parent firm. In this paper I focus on the third stage which is knowledge application within a parent firm.

2.2. Performance implications of learning from JV.

The relationship between learning and performance has been long discussed in the learning literature (Fiol and Lyles, 1985, Argote, et.al., 2000). Figure 1 presents the results of critical literature review when studies have been classified according 3 criteria: (1) The level of analysis: JV vs. parent firm; (2) Type of empirical measurements: objective vs. subjective, and (3) Geographical focus of the study: transition vs. developed economies.

Insert Figure 1 about here

This critical review allowed for making several conclusions. First, the majority of the studies have examined performance implications of learning at the JV level (e.g. Lyles and Salk, 1996;

Child and Yan, 2003; Tsang, et.al., 2004; Li, 2006). Hence, although the strategy research explicitly recognizes the fact that JV's success has to be translated into a competitive advantage of the partners (Das and Teng, 2003), the performance implications at the parent firm level have not yet been thoroughly studied.

Second, there is a clear preference for the objective measurements such as business volume, market share, achievement of planned goals, and profit. However, researchers like Makino and Delios, (1996), Child and Yan (2003) propose to use subjective measures based on managers' perceptions of performance. The argument here is that more insights exist beyond the objective measurements. Learning enables an organization to access new information and knowledge which in turn can generate various types of improvements in different functional areas such as e.g. manufacturing process development, or product development which does not lead to immediate financial outcomes. Also, concept of capabilities as a learning measurement was suggested as more relevant for examining the impact of learning and knowledge acquisition since application of acquired knowledge within organizational action represents the basis for development of new skills and capabilities. However, the detail operationalization of this measurement type has not yet been developed in the JV literature.

Third, although there are studies conducted in context of both transition and developed economies, it clearly appears that in transition economies significant attention has been paid to investigation of learning impact on JV performance. There is no study to date examining implications of JV learning for local parent firms. Indeed, as Figure 1 shows the research examining parent firms' performance implications is based only on the empirical evidence from developed countries (Inkpen and Crossan, 1995; Simonin, 1997).

To summarize, the discussion above reveals that performance implications of learning from JVs for local parent firms in transition economies have not been examined. Also, the comprehensive measurements of learning allowing for understanding of its full impact at the parent firm level are still underdeveloped. Therefore, this study aims to fill this gap.

3. Framework development

3.1. Capability development as an outcome of learning

The capabilities are considered as a vital resource necessary for gaining the competitiveness and superior performance and their development take place through learning (Nelson and Winter, 1982; Teece and Pisano, 1994). Hence, the understanding of a change in various types of capabilities is crucial if one aims to comprehend the performance implications of learning in general, and learning from JVs in particular. Indeed, capabilities allow firms to efficiently use their resources. The capability concept has been extensively applied in various streams of research and many types of capabilities have been defined. This paper, however, intends to concentrate only on technological and managerial capabilities as it has been recognized that local firms in transition economies seek cooperation with foreign firms to strengthen their technological foundations and enhance managerial knowledge and skills (Lyles and Salk, 1996; Ahn, et.al., 2006).

3.2. Technological capabilities and technological learning.

Technological capabilities have always been a fundamental component of economic growth and welfare (Pavitt, 1988; Bell and Pavitt, 1995). Processes of economic adjustments in countries with transition economies have significantly weakened competitiveness and technological foundations of domestic firms, and thus, domestic firms need to undergo through processes of technical change and catch-up with western rivals. The process of technological upgrading requires development of technological capabilities. Technological capability is defined as the recourses needed to generate and manage technological change, including skills, knowledge, experience and organizational system (Bell and Pavitt, 1995). Technological capabilities, therefore, refer to skills, knowledge and experience required to achieve technological change at different levels (Costa and de Queiroz, 2002). Hence, the presence of technological capability in organization implies that organization possess the ability to implement internal improvements in process and production organization, product and project engineering. Also, it is important to stress that technological capabilities development requires not only knowledge-based assets but also physical and financial assets. Hence, technological capability ‘is a set of pieces of knowledge which includes both practical and theoretical know-how, methods, procedures, experience and physical devices and equipment’ (Wang, et.al., 2006:30).

The literature suggests various ways to measure technological capabilities. For the purpose of this study, I adopt classification of Lall (1992) which have been also used in later studies (Figueiredo, 2002; Li, 2006). It classifies technological capabilities in three main functions: (1) investment, (2) production and (3) linkages.

Investment capabilities are defined as the skills needed to identify, prepare, obtain technology, design, construct, equip, staff and commission new facility (Lall, 1992). In other words, investment capabilities are knowledge and skills that are used to conduct a new industrial project from pre-investment activities such as feasibility studies to project execution as well the ability for efficient external sourcing. Specifically, they include the skills and routines to define needs for development and acquisition of new technology or production lines, for planning lay out and equipping new facilities; for making informed decisions regarding scale of new operations and range of products based on the optimal costs estimation.

Production capabilities according to Lall (1992) are a range from basic skills range from quality control, operation and maintenance to more advanced ones such as adaptation, improvement, or equipment 'stretching', to the most demanding ones of research, design and innovation. Practically, these capabilities define the knowledge and skills necessary to operate a plant, and encompass production management, production engineering, repair and maintenance. The manifestation of improved production capabilities can be changes in product design, manufacturing process design and specification, product quality, product quality control process.

There are two parts of production capabilities: process and product technology capabilities. Process technology capabilities are used to create and deliver products and services. Process technology includes quality control, maintenance, plant layout, inventory control and improvements in equipment and processes. Process technology depends on the level of development and sophistication, and mechanization of plant and equipment, labor productivity, achieving quality at the appropriate costs (quality performance), logistics cost effectiveness and timeliness, reliability and availability of suppliers (delivery performance); throughput and lead time referring to output rate and cycle time versus investment in raw materials. Product technology capabilities include mastering product design and specifications, improving existing

products, developing new products and licensing product technology (Wignaraja, 2002). It is also important to stress that there are two sources to achieve the improvement in the product. One is associated with improvements in the process, and is classified as a process-technology related, and the other originates from product development activities and understood here as the product technology.

Linkages capabilities have been defined as the skills needed to transmit information, skills and technology to, and receive them from, suppliers, subcontractors, consultants, service firms, and technology institutions (Lall, 1992). They are needed for organization of knowledge- and technology transfer networks within the firm and with other companies as well as with the domestic science and technology infrastructure.

These three types of functions are also classified in three levels of difficulty which are operational, advanced and innovative. *Operational level of capability* encompasses skills, knowledge and experience to search, acquire, assimilate, use, master and make minor adaptations of existing level of manufacturing process and product technologies. Improvements in operational capabilities can be manifested in the ability to implement activities more efficiently at the existing level of the technological development. *Advanced capability* encompasses skills, knowledge and experience needed for implementation of significant improvements in the existing manufacturing process and product technologies leading to the development of the new products for the domestic market. They are skills and knowledge associated with major creative imitation of adopted technologies. *Innovative technological capability* is defined as the capability to significantly change or improve products and processes. It may be described as technology changing skills needed for substantial development in technology and products at the world class level.

Also, there are several levels of technological capabilities. Table 1 presents a framework where columns set out the technological capabilities by function, and the rows, by the level of difficulty.

Insert Table 1 about here

This framework provides some specific examples of activities which are classified in certain type and level of capabilities. Hence, when conducting an empirical analysis, these tools help to assess at which level JV parent firms' were able to improve their technological capabilities of a particular type. Importantly, it also enables to conduct comparison of capabilities development process generated by learning from JVs across parent firms.

3.3. Managerial capabilities

Managerial capabilities refer in this study to the ability of the organization to integrate, build and reconfigure organizational knowledge how to organize a structure of organization, planning and control systems, determine organizational goals and incentives, coordinate different problem solving activities, allocate resources and assign personnel. Also, they include cooperation capabilities or collaborative know-how recognized as a source of specific competitive advantage (Dyer and Singh, 1998; Simonin, 2002). Indeed, a success of firms to manage partnerships and expand their network is being argued to be attributable to the particular competence to create and sustain beneficial collaboration. In other words, experience in first JVs will improve performance of the following JVs (Reuer, et. al., 2002; Zollo, et.al, 2002). As firms acquire knowledge related to managing JV they are likely to be more efficient in the managing and extracting benefits from subsequent JVs (Inkpen, 1998). Simonin (1997) suggests that the lessons should be internalized by the firm and drawn into specific know-how before they become useful for guiding future actions. Hence, this know-how has been defined as collaborative know-how and recognized as critical for the understanding of firm's performance (Simonin, 2002). Thus, I include this type of managerial capability as one of the measurements of learning through JVs.

3.4. Implications of capabilities development for local JV parents restructuring and competitiveness.

The extant literature argues for the strong relationships between organizational capabilities and performance (Nelson and Winter, 1982; Prahalad and Hamel, 1990; Wang, et. al., 2006). Capabilities in functional areas of the firm decrease the unit's costs, improve product quality and range which results in profit increase (Cantwell, 1991; Schroeder, et.al., 2002). Further, the changes in technological and managerial capabilities should be further linked to strategic objectives and long-term organizational development. Scholars like e.g. Inkpen (1996) suggest

that over long-term period successful knowledge creation should strengthen and reinforce a firm's competitiveness and growth. In the context of the transition economies, the main strategic challenge of firms in post-transition period is restructuring and organizational transformation from Soviet type into new type of organization suitable for the functioning in the market economy. Firms faced many challenges restricting their restructuring process such as e.g. outdated production facilities and technologies; lack of internal financial resources; limited state support; lack of managerial capabilities to undertake a profound changes allowing for efficient functioning in market economy; distorted linkages with other economic actors (Filatochev, et.al, 2003; Wright, et.al., 1998). Thus, local firms urgently need to implement changes in order to survive in new conditions, and to become competitive in domestic and international markets.

Wright, et.al., (1998) distinguish several revitalization strategies available to firms in transition economies which include short-term strategies aimed at cost, employment and capacity reduction, and long-term or restructuring strategies oriented towards long-term improvements in market positioning, product offering, expansion to new markets and increased innovative activities. Similarly, Dixon (2006) defines three main stages of organizational change: (1) breaking away with the past; (2) initiate learning and reconfigure resources; and (3) Secure sustainable competitive advantage. Hence, this study suggests that it is relevant and important to examine how technological and managerial capabilities building in local JV parent firms influences their restructuring and competitiveness.

3.5. Theoretical framework

As it was discussed in the previous sections this paper aims to examine whether and how JV learning influences the local parent firms' technological and managerial capabilities upgrading in transition economies which, in turn, affects the process of the restructuring and development of long-term competitive advantages. Figure 2 illustrates this argument and shows main theoretical concepts of the study and expected relationships between them.

Insert Figure 2 about here

Next, I discuss the empirical methodology employed to provide an empirical evidence for the developed theoretical argument.

4. Methodology

The careful assessment of the challenging research context and theoretical objectives of the study have led to a decision that single methodological approach, either quantitative or qualitative, cannot satisfy the requirements of this research. The application of mixed methods allows to overcome problems associated with poor quality of publically available secondary information and lack of cooperation in firms (Hurmerinta-Peltomäki and Nummela, 2004). Thus, as opposed to the main body of the literature, this research takes a novel two-stage methodological approach using a quantitative pilot-survey at the first stage and multiple-case research at the second stage.

The main purpose of the pilot survey was to acquire a preliminary understanding of Russian-Western JV activities established in manufacturing sectors in 1998-2006 as well as the nature and outcomes of learning in those JVs for parent firms. The survey questionnaires have been sent to 140 JV parent firms, but only 28 have been finally received. Each questionnaire has been addressed personally to the senior managers of parent firms. The firms have been contacted several times in order to verify the receipt of questionnaire as well as to persuade the respondents to complete and return the questionnaire. It is worth of noting that 8 questionnaires have been completed during personal interviews conducted by the researcher. Hence, pilot survey enabled to acquire great amount of knowledge and comprehend the issues related to learning outcomes in parent firms. From the practical perspective, during the survey it was possible to build the initial credibility with the companies and negotiate an access for doing a further research.

The pilot survey has been followed by a qualitative multiple case study research for the acquisition of the main part of the empirical data. A Russian parent company is considered in this research as a case, and three companies have been selected for the in-depth analysis. However, the sub-unit of analysis is each JV which Russian parent companies have established with a foreign firm. Hence, as two of the selected Russian companies have established more than one JV, there are 5 sub-units of analysis in this study. Case companies have been selected on the basis of the survey results according to several criteria: (1) Presence of cooperation in JVs established by these firms and the active participation in JV management. (2) Industry where Russian firm and JV operate. The enterprises from sectors with largest JV percentage according to the dataset were selected for more insightful and reliable results. (3) Practical considerations of the

possibility to negotiate an access to the companies influenced to a certain extent the choice of case companies. The general idea behind the case selection was to include into the study firms from different industries which have established JVs with foreign parents of different nationalities.

The main part of data was collected through personal interviews in parent companies of the selected JVs and the parent firms' representatives in the JVs. In total, However, it was supplemented by analysis of companies' internal documentation and other available secondary data, such as e.g. industry reports. The interviews were conducted in Russian and were translated into English personally by the researcher who speaks Russian as a mother tongue. The majority of interviews were taped-recorded. However, in few cases the interviewees have objected to be recorded, so the transcripts have been done on the basis of notes taken during interviews. The interviews guide was used during the interviews. The content of questions has been developed according to the assumptions derived from the analysis of the previous literature and the pilot survey. It consists of several sets of questions including general as well as more specific questions. However, although the overall structure of the interview guides was similar for all cases and respondents, the focus and depth of questions differs depending on the interviewee's position in the company. During the interviews the respondents' reflections on assumptions developed on the basis of previous literature were taken into careful consideration. Hence, the research-led interview method was used in case investigation.

The triangulation technique has been used in data analysis which enabled to examine the collected data in the comprehensive and systematic manner. Specifically, I followed several steps in data analysis were followed. First, the entire stock of qualitative data was manually analyzed and empirical manifestation of the concepts distinguished from the critical literature review was summarized in tables. In particular, for each of case companies the concepts have been grouped into several groups according to the themes in the focus of the study's propositions: technological capabilities, managerial capabilities; enterprise restructuring and competitiveness. At the next stage of the analysis, I have conducted a cross cases assessment for each of mentioned above themes and drawn the conclusion regarding the nature and extent of the outcomes of JV learning

in case companies. This assessment enabled to define patterns existing in the data and to draw the comprehensive conclusions.

5. Case description

5.1. Case Company #1: Aircraft Engine Building Corporation

The Company is one of the leading Russian industrial engine building corporations. The Company implements marketing, design, production, sales and after-sales support of gas-turbine equipment in the three main directions: military engines, civil aircraft engines and power generation equipment. The total number of Company's employees is 23.000 people where 4600 employees are involved in R&D activities. The Company possesses a solid R&D base which enables for implementation of the full cycle of new product creation starting from calculation and analysis through manufacture of prototypes and carrying out government and certification tests. Complex application of information technologies has been implemented at all stages of the product life cycle beginning from the marketing research and designing through servicing.

In 2003 an equity JV with a foreign partner was set up for development and manufacturing of civil regional aircraft engine. This JV was the first large-scale international cooperation project undertaken by the Company which implied the multi-faceted collaboration for creation of highly technologically complex product satisfying the Russian and European standards. This JV was organized on the basis of technology, risk and capital sharing principals similar to those of other international JVs in the engine building industry. The Russian and foreign parents have financially contributed to the venture on the 50/50 basis. Also, tasks have been equally divided between parent firms when Russian firm was responsible for development of cold part of engine and experiment activities, and foreign parent was responsible for the development of hot part of the engine and its integration. This engine is completely new product planned to be developed from the scratch as opposed to other engines being modified from the old models which added to the challenge of its creators. The engine development activities have been organized in parent companies' R&D units. Specifically, Russian parent has designated a separate area (unit) in R&D department of own Head Engine-Building plant for new engine development activities. Also, as development required an intense cooperation between both parent engineers, the meetings and

team assignments have been organized in this unit of Russian parent firm. The production unit has been established in the production site of Russian parent in a modernized workshop which is physically located in the separate building. The JV production is initially planned to be supplied for Russian aircraft building company. However, in long-term the markets of Europe and North America will be targeted for engine sales.

5.2. Case Company #2: Heavy truck and auto component manufacturer

Case Company #2 is one of the largest truck manufactures in Russia and represents a vertical holding including all range of enterprises from metallurgy till final assembling located in close proximity to each other. The united production complex of the Group of Companies embraces the whole technological cycle of truck production: development and production of vehicles and auto components as well as marketing of finished products and service maintenance. About 59 thousand people work in departments and associated companies. The company also has a number of assembling subsidiaries in Vietnam, Iran, Kazakhstan, Pakistan, and North Korea. The company has own R&D department which implements major part of the Company R&D activities in all areas of the Company's operations. However, due to the large spectrum of technological areas where the Company operates and limited human and financial resources, the implementation of some R&D activities is outsourced to external parties such as consultant agencies, research institutes and JV partners.

The Company has established two JVs. First JV has been formed in 2005 with German partner for a gearbox production at the new manufacturing facilities located within production site of the Company based on the technology of foreign parent. The share of foreign parent in the JV is 51% and the Company has 49% of the share. In 2006 the Company has established another JV with the American company for manufacturing engines of the series B. The engines comply with Euro 2 and Euro 3 standards for diesel emissions. Partners' shares were 50/50 in this JV.

Both JVs are organized and operating according to similar principals. Russian and foreign partners actively participate in JV management and have own representatives in the management teams. Non-managerial personnel was hired in one of JVs from Russian parent company, and in the other JV 50% were from outside both parent firms. The main customer of the JV products is

the Russian parent company itself. Also, small part of JV products is sold to other truck, bus and agricultural equipment manufacturers in Russia, Belarus and the Ukraine. In terms of contributions, foreign parents were responsible for bringing advanced technology, and the Russian Company was responsible for the provision of manufacturing site and operational management, employees and implementation of JV product adaptation to local conditions. Engineers of the both parent firms have been closely cooperating in team for the implementation of this task. Also, the Company provides the great deal of assistance in managing of other relationships within the JV boundaries with other business partners such as customers, suppliers and government authorities. The overall rationale behind JVs establishment from the perspective of the Russian company was to ensure the supply of high quality components for own trucks by using the advanced technology of foreign firms. From the perspective of the foreign parents the cooperation with large Russian company was initiated to strengthen their strategic positions in Russian market and benefit from Russian parent extensive dealer network in the Russian market.

5.3. Case Company #3: Passenger cars auto component manufacturer

The case Company #3 is a large multi-functional company which has several operational directions. The main direction of the Company's activity is a production of all kinds of plastic automotive components for vehicle of the leading Russian car produces. The Company has a main consumer, the passenger car manufacturer, where it supplies 65% of total production volume. The Company has 5500 employees. The Company has own R&D department with 300 employees which is responsible for R&D activities in all areas of operation.

The Company has established its first JV with large German manufacturer for auto components manufacturing in the year 2000. The main objective of the JVs was to manufacture auto components for one of the largest Russian passenger car manufacturer, which has been historically the main customer of the Company by using the product technology of foreign parent. Russian and foreign parents have financially contributed to JV on 50/50 basis. The Company has provided to the venture production site and infrastructure, highly qualified personnel and, most importantly, the customer relationships where JV products were planned to be sold. The foreign parents have contributed by product and process technology. The both parents had own representatives in the JV management and actively participated in JV operations.

Interestingly, the cooperation in the first JV did not evolve as it was planned and JV was terminated in early 2000s. The main reason for JV termination was the difference in parents' opinions regarding the JV product.

Despite the negative experience with its first JV, the Company has established the second in 2006 with the medium size Italian auto component manufacturer. This JV has been organized according to the similar principals as the previous one. The main objective the JVs is the manufacturing of wheels which is relatively complex element for the passenger cars. The main customer of the JV products, as in case of the first JV, is the large Russian passenger car manufacturing. Russian company has provided to the venture production site and infrastructure, highly qualified personnel and the customer relationships where JV products were planned to be sold. The product and process technology has been supplied to JV by the foreign parent. Both parents contributed on 50/50 basis.

6. Empirical analysis

This section presents the results of empirical data analysis following the logic of the theoretical framework presented in the section 2. First, I discuss how learning from JV influenced investment, production, linkages and managerial capabilities development. Then, the impact of this development on the restructuring and competitiveness will be analyzed.

6.1. Investment capabilities development

The learning leading to improvements in the investment capabilities took place in all case companies and has been perceived as important and beneficial by parent firms. However, the extent of investment capabilities upgrading varies across the cases. Table 2 describes the outcomes for each of the company at different levels.

Insert Table 2 about here

The Table 2 illustrates that, overall, Case Company #1 has achieved the most significant outcomes manifested in improvements of the existing capabilities at the advanced level and developing new capabilities at the innovative level. Specifically, at the advanced level the scope

of knowledge and skills underlying the capabilities has been broadened through JV learning which resulted in more efficient project scheduling; planning new workshops' layout, more informed assessment of latest technological solutions, components and materials choices. However, the most significant achievement in terms of investment capabilities development was the transition to the innovative level manifested in ability to implement world class project management and world class engineering. This JV was the first experience of the large-scale international cooperation when JV product (the regional aircraft engine) needed to receive the European certificate. When cooperating on JV project the Company has developed capability to organized complex logistics system requiring the high skills in managing delivery costs and schedules. Moreover, the Company has learnt about European legal requirements and procedures for the certification of engine. This was pointed as an important learning experience during the course of JV project with the foreign parent. As one of the respondents explained:

"We can compete in foreign markets only with the certified engine and at the moment it is the first product of this class. In order to develop the certified engine in the future we will need to implement its development according to international standards from the very beginning. That is why this experience is very valuable for us".

In the Case Company #2 investment capabilities were developed to a significantly lesser extent when few minor changes occurred at the adaptive and advanced levels. The upgrading to innovative level did not take place. The JV learning has led to improvements in respect of new facilities equipping decisions and planning of workshop lay out, and these improvements were recognized as being beneficial for the rapid modernization of main industrial site.

For case company #3 JV learning had important implications for improvement of investment capabilities despite the fact that they occurred at the lower levels than in previous cases (Table 2). Specifically, from its 1st JV the knowledge about basic process of the product certification has been acquired which resulted in organization of certification of production site of the Company. The respondents were consistent in emphasizing the importance of this outcome and former JV president, who has returned to the parent company after JV's termination, stated:

"The most significant what we got from them [Foreign parent in the JV 1] was learning about how to proceed through certification process. As all our products at that time were only about to

get a certificates, they taught us about ISO 2000, and then technical standard TC60049. This we are doing here now. ...It was a significant growth for us”.

The 2nd JV learning outcomes took place at the advanced level and, as in the case company #2, were manifested in development of capabilities for more efficient new technologically advanced facilities’ organization. The capabilities at the innovative level have not been developed.

6.2. Production capabilities

Production process capabilities development was perceived as the most important learning outcome by all case companies. Also, the changes in production product capabilities took place. Table 3 shows the change in production process and product capabilities across the cases.

Insert table 3 about here

Table 3 illustrates that case Company #1 has achieved the most significant learning outcomes at operational, advanced and innovative levels. First, some techniques and skills acquired from JV experience resulted in more efficient production process organization at the operational level. The company managed to improved routines leading to a higher equipment productivity, decrease of the norms of the details’ processing, implementation of stricter system of production control. The labor productivity was increased due to the more efficient organization of working stations and improvements in production logistics practices. Also, the Company expanded the knowledge about advanced techniques in various technological processes and exploitation of latest machineries and materials. Most importantly, the Company’s skills and knowledge base have been upgraded up to the level of European and American leading aircraft engine manufacturers. Second, western type of production culture was adopted. The cooperation in JV was a good mean for an exhibition of western attitudes to product quality and responsibility on Company’s employees’ mentality. To summarize, the more efficient, technologically advanced production organization was the most important area of improvements. The company was able to move to a highest level of production process capabilities which is the world class production organization, and also upgrade all previous levels capabilities allowing for the better performance. One of the respondents mentioned:

“We have radically changed the system of production organization in the enterprise and increased its efficiency”.

However, the product centered capabilities were not changed as extensively as production process capabilities. However, they were improved up to innovative level as the JV product itself was the new top level innovative product.

The production capabilities of the Company #2 have been improved to a lesser extent as Table 3 indicates. The Company has acquired the knowledge related to manufacturing process and enhanced its own production process capabilities. Specifically, practices in the area of production process planning, production control and quality management have been improved as a result of JV learning. Moreover, the successful JVs functioning resulted in expansion of scope of cooperation between partners when the Company has started the production of the several components according to the western parent’s technological requirements and specifications. The presence of foreign parent assistance in the implementation of these operations provided a good opportunity to acquire skills in process technology for producing products with compliance with western standards. During the cooperation norms and procedures of the foreign partner company have been naturally adopted by the Company employees. As one of the senior managers stated:

“Part of the production is manufactured here according to their documentation, technologies, and standards. We supply about 19 products according the requirement of our partner company. Naturally, our personnel have to learn this new knowledge, learn to work according to these requirements”.

Furthermore, the learning about different production philosophy has been pointed out by Company’s managers. Close cooperation with western firms allowed for changes in attitudes of Russian employees towards more ‘western’ type of production culture. The attitudes to responsibility, planning and understanding of the importance of every function at the enterprise inherited from the Soviet times was pointed as being the most important problems in successful enterprise development. Hence, the improvements in this area as a result of learning from JV experience were perceived as highly valuable. One of the respondents said:

“In the process of realization of the JVs we got re-assurance that this is the right approach which gives us numerous benefits, including the adaptation of western corporate culture”

However, as JV operations have been excluded from area of Company's core competence when it has been decided to rely on the foreign parent for this product development, the Company did not have learning intent to acquire product related knowledge.

The Case Company #3 has positive learning outcomes from both established JVs. The most important outcome of learning from the 1st JV was the establishment of quality management in the Company. Prior the JV the products of the Company did not satisfy quality standards, and hence, were not competitive even in domestic market. However, as JV production was established by the foreign parent according to high, although not latest, western standards, the experience of production organization and product certification has been acquired and later applied in the Company. As one of the respondents pointed:

“The role of the JV and the parent is that they taught us the procedures of the implementation of the TQM in production process”.

As the other example of improvement process, the company expanded the knowledge in respect of available technologies through JV experience. The other manager said:

However, despite the availability of different knowledge sources, the most valuable experience can be acquired only the source is inside the enterprise, in other words, from direct experience when you have an access to the advanced technologies”.

Moreover, new approaches of workshop employees towards working process organization have been acquired. Specifically, the practice of profession combination has been implemented which resulted in productivity increase. Lastly, the western production culture has been adopted as a result of learning through JVs. Even such minor aspects as the clean and shiny floors covered by certain type of material in the workshops have been pointed as noticeable aspect being adopted from JV.

In terms of product capabilities development only minor improvements took place as the JVs did not imply the product development activities. However, some aspects have been learnt and adopted in the Company's operations such as e.g. material recipes, minor product specifications. To summarize, the main area of learning and capabilities development was in the area of production process organization. Hence, manager has stated:

"We learned a lot about organization of production process and its main principals... This was a big gain for us"

6.3. Linkages capabilities

The development of linkages capabilities took place in the similar manner and extent in all case companies. Table 4 shows the influence of JV learning on linkages capabilities.

Insert Table 4 about here

The important benefit from JV experience was the building linkages with foreign suppliers, R&D organizations and customers through knowledge acquisition from the foreign parent. In particular, one of the important problems is the absence of the certified suppliers which production satisfies the European standards. Thus, leading Russian companies have to seek partners abroad, and here, JV experience allows them to learn about potential partners and build relationships with them. As manager of case Company #1 pointed:

"Our relationship with parent provide a unique opportunities to learn management practices and skills, technological knowledge, knowledge in engine logistics and access to the foreign supply channels of the details which are not produced in Russia"

Suppliers are the main problem as the development of Russian enterprises in general is slow and their technological level is behind. The localization of production is the crucial for the further industrial growth. Foreign R&D organizations are capable to deliver service in short time and for clearly defined price. Domestic R&D organizations have the ability to conduct R&D activities but lack the capabilities to do it in the efficient time and cost manner. This is another link why we need to understand macro level factors. Russian R&D sector lacks the experience to work in market conditions. Hence, JV is an important channel for leading Russian enterprises to expand linkages with partners for the development and production of the competitive products. JV

experience in itself was one of the push factors for the further innovative development, which further stimulated the initiation of new projects with universities, local suppliers and R&D organizations. One of the respondents stated:

«In this respect our partner helped us to organize the supply of some components from abroad»

6.4. Managerial capabilities

The managerial capabilities enhancement has been an important benefit of learning from JVs for Russian firms. In case company #1 one of the most significant outcomes of learning was the adoption of the management system existing in JV in companies other operations and projects. The respondents described it as follows:

”Due to the JV experience we, for the first time, implemented the matrix system approach in management. Our classic approach was functional distribution of activities between departments, but now we applied cross-functional approach when the all operations are coordinated central by program direction. This approach has been adopted from our partner. This process allows the decreasing of the time for the product development and introducing it to the market. We are implementing this approach to other programs for military and civil engines. This experience is highly valuable for us”

The other example of beneficial outcomes is the learning about JV business model which has been implemented for cooperation in other partnerships with local companies. Also, JV operations stimulated the start of an extensive personnel training and foreign parent has contributed significant amount of time and resources in providing training and teaching.

In case Company #2 the learning has been oriented towards adoption of western managerial style as the long-term strategic goal of the Company is to get integrated into the world automotive industry. For example, planning practices and procedures have been mentioned as one of the learning areas by one of the managers:

”We aim for improvements’ implementation in management practices, and we succeed to some extent. I see clear benefits from more organized planning process as the spontaneous planning leads to making a large number of mistakes due to the fact that there is not enough time to finish the task properly”

Also, as in the Case Company #2 the JV activities reveal the need of providing an extensive personnel training to sustain the speed and quality of changes in organization oriented towards enhancement of competitive advantages of the products and innovative development. Furthermore, the successful implementation of the partnership has proven the success of the corporate strategy to join the forces for product development and manufacturing with leading foreign enterprises which improved the cooperative capabilities.

Case Company #3 showed the improvements in organizational structure and systems due to learning from JV. For example, one of the managers emphasized:

”What we liked there.. Before we had complicated control system. In JV it has been organized much more efficiently... After the JV experience we have changed our system to make it less hierarchical where does not exist so many stages between the task distribution and implementation. It helped us a lot.”

6.5. Implications for competitiveness and restructuring

This study finds the clear relationships between upgrading of capabilities of case companies and their strategic restructuring and competitiveness. Case company #1 has benefited in a variety of ways. First, the development of investment, production, and linkages capabilities up to the innovative level as a result of JV learning implies that the Company can independently, outside the border this particular JV, develop and manufacture other advanced products for Russian and foreign markets which, in turn, generates additional revenues. The JV experience did play the crucial role in providing a real life example how the world class enterprise should operate and exhibited to the personnel at all levels the requirements needed to be met. As one of the managers stated in the interview:

“..When we started JV we realized that this engine will change us as a company. It was a challenge to everyone: managers, technologists, constructors and workers. We had understood that if we want to produce an engine of the world class, we have to do it according to the standards of other developed countries in terms of quality, schedules, and costs”.

Also, the experience of JV cooperation has stimulated the establishment of other partnerships for civil and military engines development with domestic companies on the basis of the same

principals as the JV with a foreign partner. Further, the successful cooperation in JV has improved significantly the positive image of the Company in the international business community and can potentially generate further cooperation.

These performance implications directly influence the path and speed of course of Company's restructuring in several ways. One is that improved technological capabilities enable for continuous optimizations of manufacturing operations enhancing the productivity and decreasing overall production costs. The other aspect of positive influence is that successful implementation of JV and follow up projects provides the Company with substantial financial resources for the implementation of the restructuring. This outcome is perceived as being important as a lack of resources for restructuring has long been the major impediment for the Company's technological upgrading. This discussion highlights the fact that cooperation and learning from JV influenced significantly Company the path and speed of restructuring and represented a strategic tool for moving from the stage two "initiate learning and reconfigure resources" to Stage three "secure sustainable competitive advantage" (Dixon, 2006). Indeed, as it was indicated by the respondents, the strategic goal of the company in next five years is to develop new products which can be sold in the foreign markets, which requires further development of technological cooperation and further increase in efficiency by decreasing the production costs, implementation of new managerial practices and increasing the degree of production automatization. As one of the managers stated:

"Our internal policy has changed the direction: from the survival strategy towards the dynamic development strategy"

The respondents from Case Company #2 have referred to the established JVs as to being highly positive experiences generated long-term strategic benefits. First, the improvements in technological capabilities influenced positively the manufacturing performance which was manifested in the decrease of costs and increase in productivity. In particular, knowledge related to the lean manufacturing practices was perceived being important as the company has started to pursue the implementation of this approach as a part of the strategic restructuring. The managerial practices have been highly beneficial for the efficiency enhancement in the organizational management system. Specifically, the practices and overall philosophy in the

planning system and cost management were emphasized as being as the most important outcomes for the overall company's development. Indeed, the understanding of the importance of fact that movement up to a level of a world class company requires the adoption of the similar managerial values and practices as others leading enterprises has been a strong incentive for the learning from JV and applying the outcomes to a strategic end. The JV is a mechanism to achieve the strategic objective of the company which is to establish the modern base of the auto component production for company's trucks. Hence, Company has accomplished its objective to establish production base of the technically advanced components.

“What are our advantages from cooperation? First, we were able to concentrate our resources on development of those directions and competences which we decided to keep in-house. By resources I mean all range of them: intellectual, human, financial. Second, we had an opportunity to learn about modern technologies and approaches. Third, we have received a very competitive product and this direction we will continue to develop. In the process of the realization of JV we have seen that this is the right approach and it allows for achievement of all mentioned above benefits including the adoption of western corporate culture”

Further, the established JVs generate an additional technological cooperation between the partners and scope of cooperation implies the manufacturing of components for JV products by the Company according to technological requirements of the foreign partners. Importantly, due to the fact that the foreign parents have a direct interest in the success of JV activities, they provide an extensive technical assistance and training for the Company's employees and opportunity to learn and acquire technological knowledge and skills also in the process of cooperation in these additional projects. It has been emphasized that, in order to ensure of successful development at the corporate level the personnel of the whole company should learn to work according to the new principals. JVs stimulate the implementation of more efficient restructuring process and represent an important force in its transition to the long-term development and growth stage. As one of the managers stated:

“Our internal policy has changed the direction: from the survival strategy towards the dynamic development strategy”

In Case Company #3 enhancement of technological capabilities has resulted in the establishment of the long-term large-scale cooperation with the large foreign car manufacturer. Specifically, the Company has signed a contract for the components manufacturing for the new assembling plant in Russia of one of the largest world producers of passenger cars. Specifically, the quality management practices implemented as a result of learning from JV have had a crucial role on the decision of this foreign company looking for the autocomponent supplier which can meet the western standards. As one of the respondents described:

"We were already prepared for manufacturing products required by western standards. For example, Ford approached us one of the first and placed the order for its products"

Secondly, as JVs have been established within production site of the Company, the technological knowledge and capabilities developed have been used for the development of other Company's products. Taking into account that the source of innovation in the industry is the product related knowledge and modern machineries, the experience of manufacturing this JV product can be slightly modified for the models of other clients. This described above examples clearly indicate that enhanced technological and managerial capabilities can potentially generate further contracts with other foreign and domestic manufacturers which, in turn, will positively influence on its financial performance.

Third, in terms of the role in the restructuring process, this case is similar to previous two. In other words, JVs are used strategically to achieve Company's long-term development and competitiveness. Figure 8.3 shows that that learning and cooperation in JV allows for a transition to a third stage of the organizational change process described by Dixon (2006).

7. Summary

This research has analyzed the change in capabilities of parent firms attributable to learning from JVs and the strategic implications of this change. Practically, it was assumed that the changes in elements underlying capabilities lead to changes in their level and degree of application within the parent organization. Hence, learning, by itself, will not provide superior performance, but must be manifested in capabilities change for superior performance to occur.

The detail analysis of capabilities upgrading in different functional areas shows that the main achievement was the upgrading of production capabilities, and in particular production process capabilities. The most important areas were quality management, production and labor scheduling, production control, workshops modernization, routing and handling material. Also, there are also similar means how parent firms capitalize on the increased through JV capabilities. First, the capabilities in the area of production process generate improvements in manufacturing performance manifested in more efficient capacity utilization, reduced inventory and manufacturing cycle times, which is reflected in the increase of labor and capital productivities, lower overall production costs, lower defect rates etc. These changes are tightly aligned to strategic objectives to complete the restructuring and achieve sustainable competitive advantage. Second, there are benefits from improvements in linkages capabilities which imply the use of acquired knowledge about foreign JV parent network for broadening range of own relationships with foreign suppliers and R&D organizations. These relationships enable to access to the R&D services and high quality supply not available in Russian for the purpose of implementation of new projects for product development and manufacturing. Third, cooperative capabilities imply the establishment of other partnerships for the new product development and manufacturing and implementing more efficiently their management which, in turn, provides the case companies with an access to new expertise and knowledge for the further exploitation or/and internationalization. Forth, improved managerial capabilities allow to enhance efficiency in operational aspects and optimization of the organizational structure which represents an important part of organizational restructuring.

Thus, the study suggests that JV learning is used as a strategic tool to implement restructuring, achieve long-term development and competitive advantage. The other interesting finding is that some of assumptions of previous research have not been found valid. For example, the assumption that there is a lack of managerial and marketing skills and qualifications (Lyles and Salk, 1996; Peng, 2000; Lane, et.al, 2001; Dixon, 2006) and there is a need for managerial training (Child and Markoczy, 1993). However, this research illustrates those Russian enterprises entering JVs have a clear strategic orientation and professional managerial teams which have skills and knowledge how to operate in the market economy. The fact that companies use JVs as a strategic tool indicates the presence of managerial competences. However, the difference in the

results is likely to be attributable to at least two factors. One reason is that the study is conducted at the latest phase of transition when local companies have had time and opportunity to accumulate competences needed for operating in market economy. The other reason stems from fact that local firms established JVs are one on the most advanced ones and represent 'new' sector of Russian industry as it has been explained in the study. However, there is a possibility that other enterprises lagging behind and which yet need to undergo a deep restructuring are still facing issues described in the earlier research.

It is also worth of noting that there are several important reasons for differences in the extent of learning benefits. One of the most important reasons for this difference is the JV scope which defines types of operations in JV and, most importantly, nature of learning opportunities as it has been also argued in previous studies (Hennart, 2008; Jormanainen, 2009). For example, JV of company #1 has been organized for the implementation of world class product development and manufacturing whereas JVs of case companies #2 and #3 implied only product adaptation and manufacturing activities of products for domestic market. Hence, as discussion in the previous section indicates, only case company #1 has upgraded the capabilities up to innovative level. The other reason is the level of existent capabilities and resources of Russian partner. For example, as discussed previously, Company #1 has had strong technological expertise compatible with those of foreign partner. However, Company #3, although recovered well from the negative consequences of reform, does not yet have the top class capabilities, and cannot cooperate with foreign partner at the same level.

8. Research conclusions

This research examined the performance outcomes of learning from JVs for Russian parent firms. Building on premises of organizational and interorganizational learning, capabilities perspective and strategy approach, the integrated model has been developed which suggests that application of knowledge transferred from JV generates the technological and organizational capabilities development which, in turn, affects the process of parent firm restructuring, long-term growth and competitiveness. The main theoretical contribution of the study stems from the fact that it provides a thorough understanding of the JV learning outcomes for JV parent firms using the comprehensive subjective measurements developed by the bridging several streams of relevant

literature and conceptualizing them in the operational terms applicable for the context of transition economies. This study has implications for the International Business research as it highlights the novel elements attributable to the progress in transition implementation refines the assumptions of the previous studies on the basis of empirical data collected at the latest stage of transition. The majority of empirical studies have been conducted on the basis of evidence collected in early stages of transition. Also, the research improves the knowledge in other areas of academic research such as FDI spillover literature by illustrating the concrete outcomes which local firms in transition economies gain from foreign firms' knowledge acquisition.

This study makes an important methodological contribution. The combination of pilot survey and case research enables for overcoming the methodological and contextual challenges and collect the rich empirical data for the thorough and valid explanation of the implications of JV learning for Russian parent firms. The study illustrates well how the different data collection methods have been applied and what suitable for the conducting research in transition economies where information accessible to the researchers is often incomplete and ambiguous. Hence, it extends the scholarly understanding and awareness of the methodological options to conduct a better quality research.

This work examines the issues representing a high value for managers' aiming to really comprehend the outcomes of the applied strategic tools and undertaken actions. Indeed, it was found that JV learning is perceived as being the important source of advanced knowledge necessary for enterprise upgrading and development. Hence, as the results of the study outline in operational terms the final benefits of the JV learning, this knowledge enhances the awareness of managers in parent firms about the value of learning from JVs.

Limitations and future research

Despite the incidence of numerous contributions described above, this study also has several limitations worth of mentioning. Firstly, empirical evidence for this research has been gathered from single national context and the major part of data has been collected from three case companies, which naturally limits the scope for generalization of the research findings. Indeed, some of the implications are context specific and cannot be applied in other empirical settings.

Secondly, as this research bridges several streams of the literature to achieve a comprehensive understanding of the research phenomenon, the elaboration on these streams varies in depth and often does not cover all aspects of each of applied approaches or concepts. The guiding principal in the theoretical development was to cover and explain those parts of theories and constructs which are most directly related to the studied phenomenon and represent useful tools for its thorough understanding.

The conduct of the theoretical and empirical work has revealed a few very interesting avenues which scholars can follow in the future. First, the examination of the benefits of JV learning in both developed countries and transition economies using the objective measurements and large scale-survey can provide a better understanding of trends and patterns of learning outcomes at the parent firm level. Second, there is a room for the cross-cultural studies when evidence can be collected from several transition economies. The implementation of research in different contextual settings allows for the better understanding of the underlying rationales for the diversity in findings attributable to context specificity. Third, overall, more work is needed to develop more comprehensive measurements for different national /industrial settings. The range of empirical concepts is still quite narrow and, as this work revealed, the other streams of the literature can offer a number of suitable and relevant for this purpose concepts. Forth, although this study has attempted to collect evidence during the pilot survey stage from both JV parents, it has been made primarily for the acquisition of underlying idea behind the JV activities. More critical analysis of learning from JVs outcomes for both JV parent firms will be particularly interesting direction for the investigation.

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Appendix

Figure 1 Review of the literature on performance outcomes of JV learning

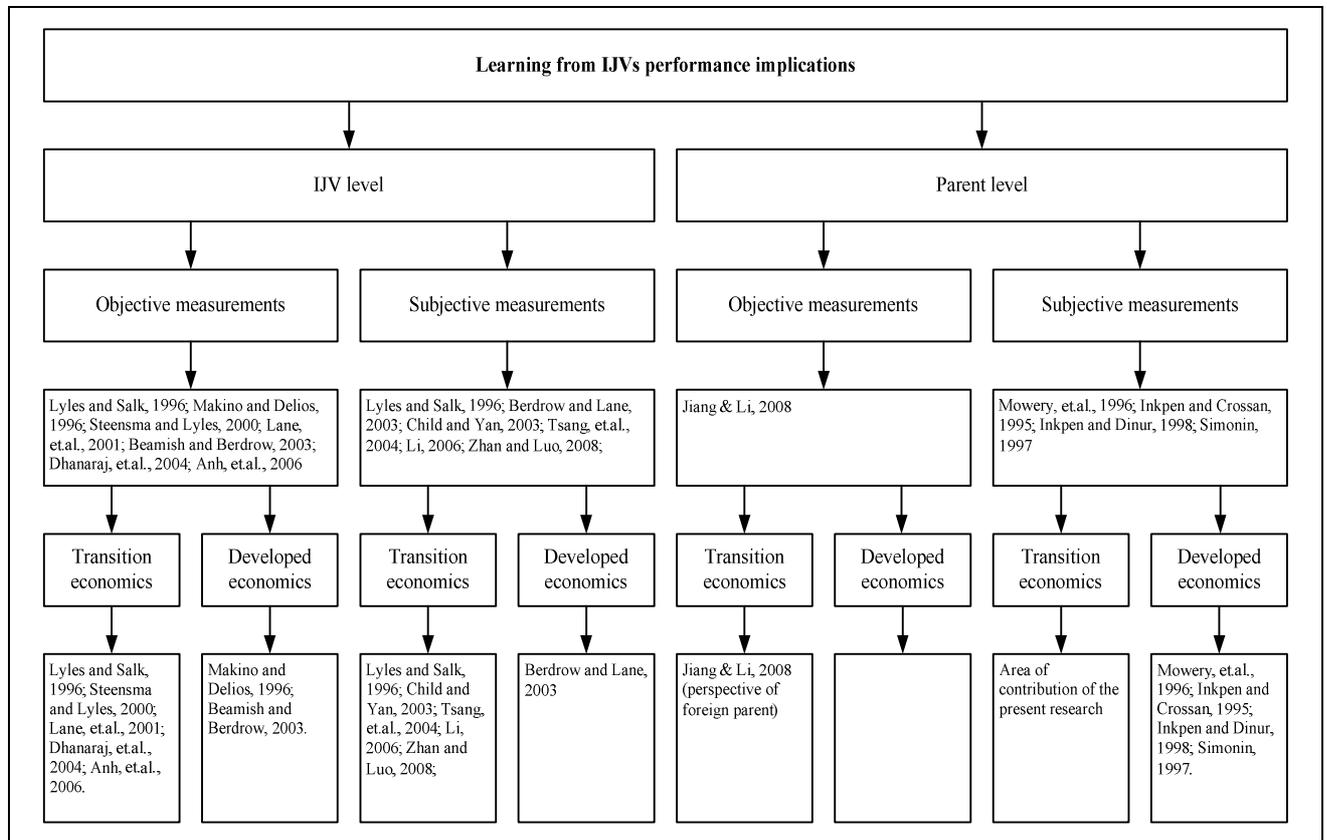


Figure 2 The performance implications of JV knowledge application in local parent firms

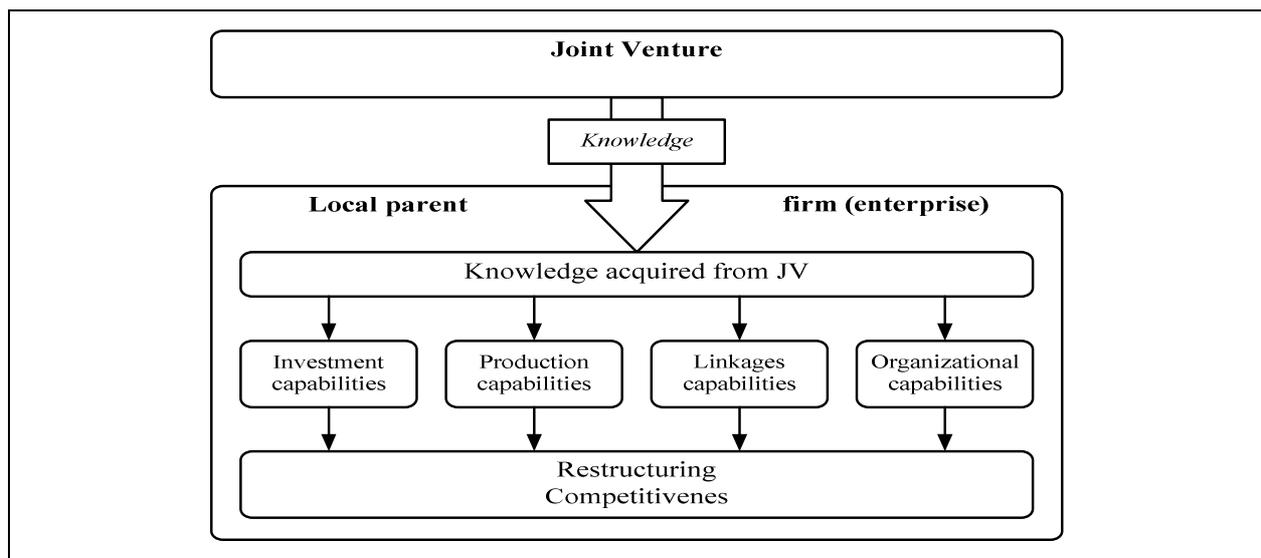


Table 1 Taxonomy of technological capabilities: an analytical framework

Capability type/level	Investment functions	Production functions		Linkages
		Process and production organization	Product centred	
Operational	Monitoring of existing plant; preparation of standard project outline; search, evaluation and the choice of technology/suppliers; standard equipment procurement; standard plant expansions; detailed engineering; project scheduling	Standard production coordination and adaptation; Basic PPC and QC; Obtaining certification for routine process QC(e.g. ISO 9000); de-bottlenecking, 'capacity-stretching'; Manipulating key process parameters (e.g. reduction)	Replication of product specifications and designs; routine product QC awarded international certification (ISO 9000); minor adaptations in given specifications to market needs; incremental improvement in product quality	Procurement of available inputs from existing suppliers; searching and absorbing new information for suppliers, customers and local institutions
Advanced	Search, evaluation and selection of advanced technology; search, evaluation, selection and funding activities for new large-scale projects; procurement engineering; engineering of the whole plant; overall project management	Process improvements and application of advanced methods; routinised 'capacity-stretching'; development logistics system for JIT delivery; integrated automated systems with corporate control system	Licensing new product technology; continuous improvements in product specifications, non-original design; design of basic characteristics for new products for domestic market	Technology transfer to local suppliers to increase efficiency, quality for local supply
Innovative	Developing new production systems via R&D; World class project mgt; world class engineering; new process design and related R&D	Innovation based on research and engineering; World class production	World class new design and development; Original product design via R&D ; product for export markets	Collaboration in technological development with suppliers, customers and partners from foreign countries

Modified from Lall (1992)

Table 2 Cross-case summary of investment capabilities upgrading

Level/case company	Case #1	Case #2	Case #3
Operational	<p>Minor upgrading <i>Improvement of some operational aspects</i> (e.g. project scheduling; plant/workshops lay out; technology choices in respect of latest technologies, facilities equipping; engineering practices, equipment procurement).</p>	<p>Minor upgrading <i>Improved</i> (e.g. advanced technology choice, workshop lay out, capacity planning; modern equipment procurement).</p>	<p>Major upgrading <i>Developed</i> (TQM system implementation) <i>Improved</i> (e.g. advanced technologies and equipment choice; procurement engineering of advanced machineries).</p>
Advanced	<p>Moderate upgrading <i>Improved, broadened</i> (e.g. learning about advanced practices in overall project management, procurement engineering of production site; project preparation, information technology, sophisticated logistics schemes).</p>	<p>Minor upgrading <i>Improved, broaden</i> (e.g. large-scale investment project planning; implementation of plant expansion and modernization).</p>	<p>Minor upgrading <i>Upgraded, broadened</i> (e.g. planning of new facilities with advanced technologies; holistic and systematic planning of new production sites).</p>
Innovative	<p>Developed (e.g. world class project management; ability to meet the European standards and requirement of engine certification; large-scale project logistics implementation, implementation of technology choice for world class production).</p>	<p><i>Not developed</i></p>	<p><i>Not developed</i></p>

Table 3 Cross-case summary of production capabilities upgrading

Level/ Case company	Case #1		Case #2		Case #3	
	Process	Product	Process	Product	Process	Product
Operational	<i>Minor upgrading</i> Minor and intermittent adaptations in the process, de-bottlenecking, ‘capacity-stretching’; strict system of production control; decrease in norms of product processing, increased equipment productivity); JIT production logistics	<i>No upgrading (Existed prior JV)</i>	<i>Minor upgrading</i> Minor and intermittent adaptations in the process, de-bottlenecking, ‘capacity-stretching’; strict system of production control; decrease in norms of product processing; lean manufacturing practices).	<i>No upgrading /Outside JV scope</i>	<i>Major upgrading</i> Obtaining certification for routine process; minor and intermittent adaptations in the process, strict system of production control; decrease in norms of product processing, increased equipment productivity).	<i>Minor upgrading</i> Improvement in product quality and specifications.; Replication of material recipes, specifications and designs.
Advanced	<i>Major upgrading</i> Continuous process improvements; Routinised ‘capacity-stretching’; production logistics systems; holistic and systematic planning of new production processes; labor productivity; automatization).	<i>No upgrading (Existed prior JV)</i>	<i>Minor upgrading</i> Continuous process improvements; Routinised ‘capacity-stretching’; production logistics systems; production automatization).	<i>No upgrading /Outside JV scope</i>	<i>Minor Upgrading</i> Optimization of production logistics systems; production control practices, production automatization).	<i>Not developed</i>
Innovative	Developed (world class production site)	Developed (world class original product)	<i>Not developed</i>	<i>Not developed</i>	<i>Not developed</i>	<i>Not developed</i>

Table 4 Cross-case summary of linkages capabilities upgrading

	Case #1	Case #2	Case #3
Operational	<i>No upgrading</i>	<i>No upgrading</i>	<i>No upgrading</i>
Advanced	<i>Minor Upgrading</i> Knowledge transfer to local suppliers to increase logistics efficiency; Introduction of higher quality requirements for local supply	<i>Minor Upgrading</i> Knowledge transfer to local suppliers to ensure the local supply of the components of appropriate characteristics and quality; new programs with universities for supply of graduates, in particular, of technical specialties.	<i>Minor upgrading</i> Knowledge transfer to local suppliers to ensure the local supply of the components of appropriate characteristics and quality; new programs with universities for supply of graduates, in particular, of technical specialties.
Innovative	<i>Minor Upgrading</i> Collaboration in technological development with foreign suppliers, customers and partners.	<i>Minor Upgrading</i> Initiation of collaboration in technological development with foreign suppliers, customers and R&D organizations.	<i>Minor upgrading</i> Initiation of collaboration in technological development with foreign suppliers, customers and R&D organizations.