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MNEs Subsidiary Training and Development and Firm Innovative Performance: The Moderating Effects of Tacit and Explicit Knowledge Received from Headquarters

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Abstract: This paper set out to investigate the ways training and development impacts on firm innovative performance as well as the moderating role of knowledge transfer received on training and development and firm innovative performance, using a sample of 229 foreign subsidiaries of multinational enterprises (MNEs) operating in China. We adopt hierarchical linear modeling, and the results of the study reveal that both on-the-job training and development and off-the-job training and development have an influence on the firm innovative performance. Also, the empirical results of the study demonstrate that the moderating effect of tacit and explicit knowledge received on the relationship between both on-the-job training and development and off-the-job training and development and firm innovative performance are stronger. This paper shows that continues updating of skills, ability and knowledge of the workforce through on-the job training and development and off-the job training and development and off-the job training and between both continues updating of skills, ability and knowledge of the workforce through on-the job training and development and off-the job training development programs might boost creativity and innovation of business organizations.

Keywords: subsidiary; training and development; firm innovative performance; tacit knowledge; explicit knowledge; hierarchical linear modeling

1. Introduction

The 21st century has presented a lot of dynamics to the business environment. With increasing globalization, business organizations are in a fierce turbulent market environment, battling for competitive advantage, sustainability and sustainable development [1]. This phenomenon has pressurized business organizations to develop more sustainable models to address numerous challenges in the business environment. Scholars [2,3] have acknowledged the significance of innovation to a firm's sustainable competitive advantage and development. For the past few years, innovation has spurred exponential effects on service and non-service sectors for massive transformation and radical change. Firms that are eager to thrive for competitive advantage mostly depend on their ability to institute and manage training and development programs for workforce to enhance innovation prowess.

Scholars and business strategists have recognized training and development of the workforce as an important catalyst for firms' competitive missile in this fierce environment [4–7]. McLagan [8] postulates that training and development emphases on recognizing, guaranteeing and serving develop, through strategic learning, the vital abilities that empower employees to accomplish present or future jobs. Generally speaking, training and development aimed at enhancing organizational efficacy [9],



employees' skills or abilities [10] and productivity [11,12] towards sustainability. The concept has provided major insight to international business players to empower their workforce in order to generate advance novel ideas [13,14] for enhancing higher innovative performance in this changing world. Admittedly, the success of a firm can be determined by the efforts of its workforce [15,16]. Therefore, it is imperative for firms to optimize their workforce through comprehensive training and development schedules to link them with the overall aims and objectives of the firm to enhance innovation capability, which in turn guarantee sustainability. Jodlbauer, et al., [17] assert that American companies spend approximately 50 percent of the investment in training and development schedules which result in organizational and workforce enhancement. In worldwide, governments and corporate captains spend billions of dollars on workforce training and development programs to enhance their capability in the area of performance, productivity, effectiveness, innovation, and creativity, among others. Previous studies have shown the positive impact of training on productivity [18], employee motivation [14], financial performance [19], and firm performance [20]. However, some empirical studies present contradictory views on the direct effect of training on firm performance [21]. Scholars [22–24] are of the view that training has an indirect effect on firm performance. Other researchers have identified interceding link between training and firm performance: climate [24]; productivity [22]; organizational learning [21].

Unfortunately, the link between training practices and organizational innovation has been widely overlooked [25,26] and the influence of training and development practices on firm innovation performance are yet to be studied by scholars [25,27–31]. Sung and Choi [32] express lack of theoretical elucidation and empirical evidence as being among the two key variables. From the extant literature, one of the few studies related to training and development and innovative performance is one conducted by Sung and Choi [32] on Korean companies from various sectors. However, they treated the investment of training and development and its impact on innovation performance and did not explicitly test which factors influence the two variables. The paucity of research on the link between training and development and firm innovation performance presents a major obstacle in the advancement of literature on human resource and multinational enterprises (MNEs) subsidiary innovation performance. This study attempts to take a more holistic perspective by explicitly theorizing and testing the influences of different types of training and development schedules (on-the-job training and development and off-the-job training and development) on firm innovative performance using foreign subsidiaries of multinational enterprises (MNEs) operating in China. Specifically, this paper proposes and test the moderating role of knowledge transfer received (tacit and explicit knowledge) in the training and development and firm innovative performance link. To make theoretical progress, we must address the "more interesting issues of how knowledge transfer received matter, under what circumstances and in what ways" [33].

MNEs Subsidiary is an intriguing and relevant area in which to examine how knowledge transfer received matter. In this paper, we depart from usual knowledge transfer issues where headquarters always dump knowledge on subsidiaries. We rather concentrate on the situation whereby subsidiaries request tacit and explicit knowledge from the MNEs complex network to augment local knowledge for their operational activities. Kandemir and Hult [34] assert that innovativeness stretches firms' competitive edges which empower them to survive and grow in the international market arena. For subsidiaries to survive in this turbulent international arena, seeking knowledge transfer is paramount to their business activities, which in turn can affect innovative performance [35,36].

We make three significant contributions to extend the extant literature. First, this research responds to the calls for research on training and development that focus on innovation performance [25]. Considering that maximizing the impact of the workforce in organizations is one of the core inquires in human resource management [37] and the underlying mechanisms that account for the effects of training and development programs to build and equip workforce on subsidiary innovative performance are remaining as the "black box", this study demonstrates how different types of training

and development influence firm innovative performance. Thus, we make contribution to human resource management literature, specifically training and development.

Second, there are a few studies that include mediating and moderating variables in the framework [31,38,39], but there is none to our knowledge that analyzes the moderating effects of knowledge transfer received (tacit and explicit knowledge) between training and development and firm innovative performance. Our empirical results demonstrate strong moderating effect of tacit and explicit knowledge received in the relationship between both on-the-job training and development and off-the-job training and development and firm innovative performance. This provides empirical support for the theoretical preposition that knowledge transfer serves as a catalyst for innovation performance [40]. By synthesizing insights from studies on knowledge transfer, this study demonstrates that when we distinguish the two-knowledge type received, their respective effects on firm innovative performance are strong and clear to identify. The effects of firm innovation performance are critical in the development of sustainable competitive edge in turbulent marketplace. We extend the literature on firm's knowledge-based view by demonstrating how knowledge transfer received impact on firm innovative performance.

Finally, today's hyper-competitive environment constantly pressurizes firms to be innovative in order to balance and meet multiple demands from various stakeholders. This study is highly significant as it bridges three distinct literatures of training and development, knowledge management and innovation management to provide a guide as to how firms should achieve better innovation performance. To the best of our knowledge, these three constructs have not been examined together in a single study.

The study is structured into eight sections: in the first section we introduce the entire research topic. The next section takes a critical review of theories. The third section deals with hypotheses development. Section four introduces our research context, variables and measures, and sample and data collection. The empirical result is captured in section five, while discussion, conclusion, limitations and future research opportunities are presented in the last three sections.

2. Theories

2.1. Training and Development

From the training and development literature, several scholars have come out with the definition of training and development [8,9,41,42]. Katz and Kahn [9] describe training and development as a safeguarding subsystem, envisioned to advance organizational effectiveness by growing routinization and expectedness of behavior. While McLagan [8] postulates that training and development emphases on recognizing, guaranteeing and serving develop, through strategic learning, the vital abilities that empower employees to accomplish present or future jobs. The main import of training and development from the various definitions centered on firm performance and workforce capability enhancement. Generally speaking, training and development aimed at enhancing organizational efficacy [9], employees' skills or abilities [10] and productivity [11,12]. Hung [43] posits that training and development can undeniably be described as giving an enhancement to performance at work. Over the past three decades, renowned firms around the globe have prioritized training and development as their top agenda and committed huge investment to update workforce [37] into a source of sustainable competitive edge [44]. For instance, Chen, et al. [45] studies in top 1000 Taiwan organizations reveal that 478 (47.8%) of the organizations perceived training and development as their top most priority agenda in their corporate plan. The success and survival of a firm can be determined by the efforts of its workforce [15,46]. Barney [47] postulates that firm aiming for survival and success main sources of competitive edge are its intangible resources. Therefore, it is imperative for firms to optimize their workforce through comprehensive training and development schedules to link them with the overall aims and objectives of the firm. The investment in training and development cultivate firms' overall erudition principles [48,49], which enhances employees' readiness to develop their competences and engross in activities to think outside the box to generate creative and innovative

ideas towards firm development. Training and development outlook in a firm is a momentous driver of employee rendezvous. Admittedly, training and development is considered to be a systematic update of knowledge, skills and attitudes of employees in internal or external educational methods and programs to increase their capabilities in order to actively pursue divergent information needed to perform firm activity or task to enhance performance [50–52]. Firms have different training and development methods to face today's fast changing business environment [49,53]. However, broadly, it can be categorized into on-the-job training and development and off-the job training and development. In this context, we intend to advance the views of Armstrong, et al. [54]; Noe, Tews and McConnell Dachner [49]; Dessler, et al., [55] and define on-the job-training and development, as a day-to-day training programs or especially tailored training programs (job rotation, planned experience and mentoring, etc.) at the work place in which employees involve themselves during their usual job. We further on define off-the-job training and development as a formal training course (lectures, talks, simulation, case study, role play, workshop, etc.) away from the place of work.

2.2. Explicit and Tacit Knowledge Transfer

The concept of knowledge has been in existence for so many decades, yet still there is no consensus among scholars concerning its definition [56]. Scholars [57,58] define knowledge as what someone believes to be true, and considered to be built on personal experiences, communication and interpretations of messages received. Gamble and Blackwell [59] define knowledge as know-how and understanding formed by personal experiences and the way new information is processed by the mind. The lack of consensus has triggered so much disagreement over what are, exactly, the different types of knowledge. The proponents of knowledge tend to assume that knowledge has different categories that include: priori, posteriori, explicit, tacit, propositional, procedural, empirical, meta, and dispersed. However, some scholars on knowledge have proffer that the import of various ideas and types of knowledge have commonalities such as tacit and explicit element which can provide competitive edge in all endeavors. For instance, in business field, scholars and practitioners have recognized knowledge as most vital resources [60] for creating competitive advantage in global market arena [61]. Firms that wish to be global giants and survive the turbulent and ever-changing business landscape advance ability to create and transfer knowledge within organization's network to subsidiaries to position themselves. They create knowledge repositories and become differentiated network consisting of both home and host countries national cultures [62] to push the overall strategic agenda for sustainable competitive advantage. Frost [63] posits that firms or subsidiaries can adventure the prevailing knowledge repositories and combine with other source of knowledge to explore new issues to address market and social needs. In Michael [64] studies on human knowledge, he classified knowledge into two categories; namely: tacit and explicit knowledge respectively. The dissimilarity among tacit and explicit knowledge is crucial for understanding organizational knowledge [65]. Polanyi [66] defines tacit knowledge as the knowledge that is non-verbalizable, instinctive and implicit. This form of knowledge can be learned through collaborative experience and is problematic to articulate, and formalize [67,68] due to its embeddedness in people or held collectively and resides in top executives' schemes, firm culture and routines, and organizational consensus on past collaborative experiences [68]. Certainly, tacit knowledge is regarded as an asset leading to competitive edge in most organizations [69,70]. Organizations that posses' key success factors such as technical skills, expertise or experience, values, and mental models are most likely to have commanding lead in the market space as these unwritten factors are difficult to imitate by competitors.

On the other hand, Nonaka and Takeuchi [68] define explicit knowledge as formalized and codified knowledge in the form of manuals, rules and specifications, which can easily be transferred. This kind of knowledge is also referred to as know-what can be possessed by an individual or an organization [71]. One advantage of explicit knowledge is its easier recognition, accumulation and retrieval [72] to effect organizational performance. The limitation of this type of knowledge, however,

is that it is easier to be duplicated by competitors. For firms to be in competition, they can add more value to their explicit knowledge to satisfy market and environment demands.

For firms to achieve sustainable competitive advantage, formation and incorporation of knowledge is the paramount to success [73] through organizational knowledge transfer. Gupta and Govindarajan [74] define knowledge transfer as a communication process between transferor and transferee through a transferring channel. Knowledge transfer is a critical tool for firms to gain competitive edge, survival and prosperity [40] in the international market arena. There are two approaches that can be adopted to transfer knowledge. These are knowledge spiral model and communication model. The former was posited by Nonaka and Takeuchi [68] to elucidate the purpose of spiral process of tacit and explicit knowledge conversions in the organizational knowledge creation. The model depicts how four modes, namely socialization, externalization, combination and internalization, aid in conversion processes. The first two modes (socialization and externalization) exemplify how tacit can be transferred in the process. It shows that socialization upholds the knowledge in its tacit form, while externalization transforms it into explicit knowledge. The last two modes (combination and internalization) demonstrate how explicit knowledge can be transferred in the spiral way. It also shows that combination retains its explicit nature, and internalization transforms it into tacit knowledge. The model subject transforms both tacit and explicit knowledge into scrutiny, distinguishing knowledge that is easily sharable from others. The processes also create a pathway for existing knowledge to be transformed into new knowledge. The latter model was conceived and developed by Szulanski [75] to describe intra-firm knowledge transfer. The model basically explains a message transmission from a source to a recipient in a given context.

2.3. Knowledge Transfer, Training and Development and Innovation Performance

The transfer of knowledge being tacit or explicit is frequently acknowledged as a vital antecedent to innovation performance [40]. Van Wijk, et al., [76] assert that knowledge transfer aids firms to discover their innovation performance. Knowledge transfer within intra or inter firm network create chances for collective learning and co-existence, leading to novel knowledge, innovative approaches and practices to augment firm performance [77]. The concept of training and development and knowledge transfer emphasizes on how firms update the skills, abilities, experience and knowledge of their workforce through training and development programs [78] to handle or support tacit or explicit knowledge transfer received, which in turn can contribute to firm innovative performance [42,79,80]. Training and development support the transformation of tacit or explicit knowledge received by providing a platform where new knowledge could be generated, developed, shared, integrated and applied towards firm innovative performance. In major organizations, training and development programs rope knowledge management actions through its accrued benefits, leading to innovative performance [81]. Firm innovative performance refers to the introduction of any new product, service, process, patent application into an organization. Scholars have asserted that the exchange and combination of knowledge through training and interaction among various actors, lead to the development of new products and services [68,75]. Admittedly, the processes pathway for existing knowledge to be transformed into new knowledge, which could be useful strategic option to advance and boost innovation performance. Innovation performance is regarded by scholars and practitioners as a panacea for firm's sustainable competitive edge and development [2,3]. It is expensive and difficult to achieve but it can generate rare, valuable, sustainable, intangible, difficult to imitate and substitute, and matchless competencies and capabilities, which in the long-run, lead to development of sustainable competitive edge to outweigh competition in product, service and concept markets in the international arena [82].

Consequently, it is important for firms to establish favorable environment for training and development and knowledge assimilation and adoption as it aids new knowledge conception to achieve innovation performance. Through this process firms can combine both internal knowledge (acquired by workforce through training and development schemes) and external knowledge (acquired through the

inter or intra knowledge transfer network) to create new knowledge [63] which at times will be hard for competitors to imitate. The application of the new knowledge can generate novel products and services, leading to innovation for firms to survive and flourish in the dynamic marketplace. Firms that pay attention to such knowledge and manage them efficiently, turn to create valuable resource to serve as innovation-based competitive edge to command the marketplace. We develop our hypotheses in the next section.

3. Hypotheses

As shown in Figure 1, the baseline proposition for our hypotheses focus on the effect of two factors, training and development, and knowledge transfer received on firm innovative performance. We will analyze the effect of training and development (on-the-job training and development and off-the job training and development) on firm innovative performance, as well as how knowledge transfer received (tacit and explicit) from headquarters influences the training and development types and firm innovative performance consequences.



Figure 1. The framework for hypotheses.

3.1. On-the-Job Training and Development and Firm Innovative Performance

McLagan [8] postulates that training and development emphases on recognizing, guaranteeing and serving develop, through strategic learning, the vital abilities that empower employees to accomplish present or future jobs. The concept aimed at enhancing organizational efficacy [9], employees' skills or abilities [10] and productivity [11,12]. Modern organizations have adopted the concept as an important component in producing human capital for strategic development. For instance, most organizations focus on the on-the-job training and development, which can be regarded as a training process that takes place at employee's actual working place while doing his usual job. Armstrong and Lorentzen [83] contend that on-the-job training programs engage the service of more experienced people or trainers who coach or teach employees at the desk or at the bench. At times, team leaders, managers, supervisors, mentors are engaged to coach or teach employees on issues concerning individual or group assignment and projects. Deming [84] posits that on-the-job training supports workforces to get the knowledge of their job in practical and improved way to enhance performance. Scholars [85,86] assert to the impact of on-the-job training on productivity. Studies have also proved that on-the job training presented by firms can be more substantial than off-the job training [87] and can have greater influence on firm's tendency to innovate. Dostie [88] studies on Canadian firms provide a positive relationship between on-the-job training and innovation. We argue that in this turbulent market environment, top executives of multinational firms or subsidiaries

support of workforce capacity building is one of essential variables that can affect firm innovative performance and ultimately stay in competition. Employees who are exposed to on-the-job training and development program acquire specific and local knowledge and this makes them impact immensely on organizational goals and objectives. A well-equipped workforce generates innovative ideas towards firm performance. From the discussion we make the following hypothesis:

Hypothesis 1a (H1a). On-the-Job training and development has significant positive effect on firm innovative performance

3.2. Off-the-Job Training and Development and Firm Innovative Performance

Training and development play a crucial role in modern organizational set-up. Performance oriented organizations adopt the process to update employees' skills, knowledge, attitudes and new insights in the environment to broaden their horizon with new and valuable ideas for innovation [14,89,90]. Scholars [68,91,92] in innovation have stressed on the role of dynamic learning and hunting new knowledge in innumerable steps of innovation from problem identification to implementation. Off-the-job training and development exposes workforce to general principles and prevailing comparative ideas and practices. Such training practices could broaden employees learning with minimum 'training transfer' difficulties and make up for deficiencies in their workplace. Firms mostly designed this type of training to meet the shared learning needs of a group rather than a particular individual's needs. Off-the-job training and development can be regarded as a formal training course taken in a form of lectures, talks, seminar, workshop [93,94], simulation, role play [95], vestibule, case study etc., away from the place of work but attempts to kindle real working conditions. Armstrong and Lorentzen [83] contend that off-the-job training could be conducted by external training establishments, training consultants or organization's members of the training department. Employees that subject themselves to off-the-job training develop confident and apply what they have learned from outside specialists and experts to create new ideas to impact on the organization growth agenda. From the extant literature a lot of studies have been conducted on the influence of off-the-job training on productivity and other variables [88]. However, only a few studies so far have explored the theme of innovation despites its significance in the firm development. For example, using a longitudinal Canadian data from workplace and employee survey, Dostie [88] results reveal a positive relationship between off-the-job training and innovation. We argue that globalization has created challenges to global firms to provide antidotes for survival and success. Firms especially subsidiaries must endlessly introduce innovation to address markets demands and changing customers' needs in the business environment. Innovation is a critical tool for enhancing firm performance in the market arena [50,54]. A firm may achieve competitive edge if it effectively positions its resources and develop relevant capacities through training and development to equip employees to assimilate and exploit knowledge. It is therefore, important for subsidiaries to allocate substantial investment on off-the-job training programs to sharpen the skills, knowledge and attitudes of the workforce as such training broaden their horizon to introduce and apply new innovative ideas for firm innovative drive [96]. There is little empirical support for the link between off-the-job training and development and innovation. We thus reach the following hypothesis:

Hypothesis 1b (H1b). *Off-the-job training and development has significant positive effect on firm innovative performance.*

3.3. Knowledge Transfer Received as Facilitator of On-the-Job Training and Development and Off-the-Job Training and Development and Firm Innovative Performance

In this paper, we investigate how knowledge creation (tacit and explicit) moderate on-the-job training and development and off-the-job training and development to improve firm innovative

performance. Proponents of knowledge-based view (KBV), believe that knowledge is the core basis of value [97,98] that firms can rely on to create fundamental competence for their value creation mechanism. For firm to survive in today's fierce competitive and challenging circumstances, its competencies and intangible resources are crucial for that expedition [99,100]. Grant [60] posits that knowledge is the most important cause of firm competitive edge [60]. Firm's ability to create knowledge or source knowledge along the intra or inter firm network is crucial step for survival. Knowledge transfer within intra or inter firm network create chances for collective learning and co-existence, leading to novel knowledge, innovative approaches and practices to augment firm performance [77]. Van Wijk, Jansen and Lyles [76] assert that knowledge transfer aids firms to discover their innovation performance. We argue that subsidiaries of MNEs request knowledge (explicit and tacit) that may arise but uncertain market and harbor commercial potential to complement the local knowledge to enable them generate new ideas for new product development to satisfy customers' needs and wants in the business environment. This in turn, helps them to improve innovation performance, leading to competitive edge and sustainability. We expect knowledge transfer received to play a significant role, as it can help workforce to update their skills and knowledge through training and development programs [78]. Prior studies have established a strong association between knowledge sharing and training and development [42,79,80]. In a similar vein, Pee and Kankanhalli [81] postulate that training and development supports knowledge management actions through its accrued benefits towards firm performance. Therefore, the moderating influence of knowledge transfer received between training and development programs and firm innovative performance need to be established. We therefore hypothesize that:

Hypothesis 2a (H2a). *Knowledge transfer received moderates the effects of on-the-job training and development and firm innovative performance.*

Hypothesis 2b (H2b). *Knowledge transfer received moderates the effects of off-the-job training and development and firm innovative performance.*

3.4. Tacit and Explicit Knowledge Transfer Received as Facilitator of On-the-Job Training and Development and Firm Innovative Performance

Proper understanding of knowledge transfer concept and its application can lead to firm's competitive advantage and improve innovation performance. Prior studies show that knowledge transfer has positive impact on firm performance [40,101]. In Polanyi's (1966) studies on human knowledge, he classified knowledge into two categories; namely: tacit and explicit knowledge respectively [64]. The dissimilarity among explicit and tacit knowledge is crucial for understanding organizational knowledge [68,102]. Specifically, explicit knowledge often referred to as how-what can easily be formalized and codified in the written form. Explicit knowledge is usually transfer from headquarters to subsidiaries and vice versa, or share within the organization to enhance innovative performance. According to some scholars, explicit knowledge positively influences firm performance [103–105]. On the other hand, tacit knowledge, sometimes referred to as know-how contributes in diverse ways towards firm performance. Researchers in knowledge management posit that it is the most valuable source of knowledge for innovation and sustained competitiveness [106,107]. It is particularly important for creating competitive advantage for business organization that pay attention to it. Prior studies have found that tacit knowledge transfer has influence on firm innovative performance [108–110]. This view is supported by Harlow [111], who pointed out that the impact of tacit knowledge of firm innovation performance is placed at higher levels in Canadian and American companies. We argue that knowledge transfer received enhances firm's knowledge stock that can be imparted during on-the-job training and development programs. Admittedly, highly committed on-the-job trained workforce can easily grasp, absorb and implement tacit and explicit knowledge transfer received and make it innovative in the market environment.

For subsidiaries to have proper implementation of tacit and explicit knowledge transfer received, strong policy and institutionalization of on-the-job training and development is paramount. As it encourages employees to acquire (from explicit to tacit knowledge) hypothesis-testing capabilities by having them work in cross-functional teams under the instruction of advisers, to generate ground breaking ideas [112] towards firm innovative performance. This led to the following hypotheses:

Hypothesis 3a (H3a). *Tacit knowledge received moderates the effects of on-the-job training and development and firm innovative performance.*

Hypothesis 3b (H3b). *Explicit knowledge received moderates the effects of on-the-job training and development and firm innovative performance.*

3.5. Tacit and Explicit Knowledge Transfer Received as Facilitator of Off-the-Job Training and Development and Firm Innovative Performance

Whether knowledge is tacit or explicit plays a significant role in socio-economic fiber of every organization. Prior studies have established the significant role of knowledge transfer on firm performance. Dhanaraj, Lyles, Steensma and Tihanyi [104] work on Hungarian international ventures reveal positive results between explicit knowledge and performance, while studies conducted by Anh, Baughn, Anh, et al., [113] in Vietnamese international joint ventures reveal positive results between tacit knowledge and performance. We therefore argue that firms that put in place proper mechanisms transmute knowledge transfer received into viable innovative performance to outweigh competitors. For firms to transmogrify knowledge, especially tacit knowledge, interaction is very important. Jakubik [114] asserts that knowledge is embedded in human actions and interactions. Off-the job training and development offers firms and employees an opportunity to learn experience (tacit knowledge) and codified information (explicit knowledge) through interaction and lectures outside the boundaries of the working environment and apply them as an innovation tool [115,116]. We argue that tacit and explicit knowledge influence the off-the-Job training and development to impact positively towards firm innovative performance. Therefore, we tested the following hypotheses:

Hypothesis 4a (H4a). *Tacit knowledge received moderates the effects of off-the-job training and development and firm innovative performance.*

Hypothesis 4b (H4b). *Explicit knowledge received moderates the effects of off-the-job training and development and firm innovative performance.*

4. Empirical Analysis

4.1. Research Context

This study focuses on all top executives of MNEs subsidiaries situated in China. These MNEs subsidiaries typical compete in the global market place to achieve the portfolio effects in operations. This research intends to determine the relationship between training and development and firm innovation performance as well as the mediating role of knowledge transfer received from headquarters at the firm-level. In fact, subsidiaries innovation is achieved through the application of explicit and tacit knowledge acquired by workforce through training and development programs. We conceptualize our study in the context of MNEs subsidiaries in China for three reasons. First, the study has implication for Chinese innovation context, which is among robust emerging economics. Second, the country has been ranked among the world leading recipients of foreign direct investment in recent years. It is 2nd to United State of America [117]. This makes China an ideal country suitable to test the mediating role of knowledge transfer received on training and development and firm innovative performance.

Third, China is world populous country and has attracted MNEs from different countries to hunt for competitive advantage and growth.

4.2. Variables and Measures

4.2.1. Independent Variable

Although the measurement of training and development has not reached a consensus among scholars, the extant literature presents a scanty report on the impact of training and development and firm performance. However, scholars and practitioners acknowledge the importance of training and development in firm development. Based on a critical literature review, we developed four items scale for competence-based training and development. Sample items include "our company placed high priority on training and development of employees to be more creative and innovative", "Our company organizes formal training programs to teach new hires the skills they need to perform their jobs".

We also categorized training and development into two: on-the-job training and development and off-the job training and development. We adapt the scale design by [118,119] and asked the executives to indicate the extent to which each method is used for training in their organization (see Appendix A).

4.2.2. Dependent Variable

From the extant literature there are different kinds of performance. For example, financial performance, corporate performance, and innovative performance, among others. These are measured either through objective or subjective gauge [120]. In this paper, we adopt subjective gauge to measure innovative performance of MNEs subsidiaries in China. This approach was adopted to ask informants to assess subsidiary performance relative to the performance of industry competitors due to some firms reluctant to report their absolute data based on several reasons. We adapt variables designed by Chen, et al., [121] and LI, et al., [122] to measure firm innovative performance (see Appendix A).

Five key items were measured using reflective questions on the executives' firm innovative performance in connection with their key competitors. The sample items include "the number of new products/services", "ratio of new products sales to total sales", "speed of new product development", "number of patent applications", and "novelty of new product/service".

4.2.3. Moderating Variable

Subsidiary received invisible and intangible knowledge transfer from headquarters to create sustainable competitive advantage in the market place to outweigh competition. Scholars in IB acknowledged that knowledge is a valuable resource in an organization and can be classified into two, namely: tacit and explicit knowledge transfer respectively. Tacit knowledge is more significant in organization and individual policies while explicit knowledge is mainly in codification policies [68]. These two categories of knowledge transfer received by subsidiaries were taken into consideration to assess their relationship between training and development and firm innovative performance. We used well established scales from the literature for tacit and explicit knowledge variables. Two of the tacit and explicit items were adapted from Dhanaraj, Lyles, Steensma and Tihanyi [104] and two each were added making it four each for executive assessment (see Appendix A).

4.2.4. Control Variables

In this study, we control several variables that may influence firm innovative performance in our analyses. In all, we use four variables: firm size, firm age, industry type and research and development (R&D) intensity. First, to establish for alterations between firms, firm size contains a lot of volumes which potentially impact on firm performance. Ravichandran, et al. [123] assert that firm size echoes a firm's previous feat and may influence existing performance. Therefore, the number of employees of each firm can has peculiar influence on firm performance in the area of power of pricing and bargaining, and the commonness of operation and management routines. On the other hand, in terms of knowledge

transfer, larger subsidiaries as compared with smaller subsidiaries may be at disadvantage to acquire less knowledge from headquarters, because it is presumed that they can engender more knowledge themselves. We control for firm size by using the natural logarithm of the total number of full-time employees in five employment size sorts (i.e., 0–200, 200–499, 500–999, 1000–4999, and >5000).

Second, firm age is selected as a control variable because of its potential influence on firm performance. Subsidiaries which are older incline to be more self-sufficient and generate more innovative activities [124] to turn performance around rather than depending on headquarters for knowledge transfer. However, in other cases the situation is different as aged subsidiaries have rarer stimuli to conduct innovative activities mostly due to stringencies of core capabilities [122]. It can influence firm performance towards survival and sustainability. In this study, we control for firm age by using the number of years since the operation of the subsidiary in the host country (i.e., <2 years, 2–5 years, 5–10 years, and >10 years).

Third, at the industry type, we group the subsidiaries into three industries: manufacturing, service and agriculture. We argue that subsidiaries in different categories of business may need different level of knowledge transfer to apply in their environment which can eventually influence firm innovative performance. Therefore, we control the industry characteristics by using code (1, 2, and 3) for the three industries in order to establish industry effects as growth patterns differed in different industries.

Finally, we control R&D intensity as it has influence on firm performance. Subsidiaries that tend to spend on research and development improve their innovative performance towards organizational survival and sustainability. Level of R&D expenditure relative to key competitors was used to measure R&D expenditure in our study.

4.3. Sample and Data Collection

To test the hypotheses of the study, we gathered firm-level data from top executives of MNEs subsidiaries through a survey research design to ascertain the effect of training and development on firm innovative performance, and the moderating of knowledge transfer received in translating training and development into firm innovative performance, using seven-point Likert scales ranging from strongly agree to strongly disagree.

Prior to the distribution of the survey instrument, steps were taken to develop ideal tool for the study. First, well-established and verified scale from the extant literature [104,118,119,121] were consulted. In addition, we added other relevant items for achieving the purpose of the study. Second, the survey design was built in English and went through translation, back-translation, and pretesting [125]. The questionnaire was cross-checked by five experts in the field of international business and entrepreneurship. All the concerns raised by the team of experts were deliberated on and reconciled to ensure accuracy of the scales. Third, we piloted the instrument with 33 MBA students at the leading business school in China who had an international business background to improve the face validity and content validity of the survey. Based, on the feedback received, we revised and reworded any ambiguous items, primarily to readability, ensure consistency of interpretation, and to reduce the length of the survey. Scholars [126,127] believe that a sample size of twenty respondents for a pilot test is recommendable for effective research study.

We obtained the data of the study through MBA (EMBA) education center of University of Electronic Science and Technology of China (UESTC) website. The center has been in existence since the 1990s, to provide continuing education services and training to corporate executives. It has a real repository of thousands of corporate executives' background information, such as their names, company names and their positions for research purpose. Fortunately, the Director of center is part of our National Natural Science Foundation project and provided tremendous support towards our data collection process. To gather high-quality data from foreign subsidiaries multinational enterprises executives, who have a deep understanding of the company's various operational data, we adopted the following approach.

First, we sent an invitation e-mail to the top executives named in the MBA (EMBA) education center of UESTC outlining the main reason behind the study and asked if they would take time to partake in the survey. We received encouraging feedback from the executives, who were willing to participate in the exercise. Second, we uploaded the questionnaire to a web page and sent the website link to the executives who responded positive to our initial request. Third, a reminder mail was sent out in five weeks' time. In all a total number of 385 questionnaires were distributed from late August to early October, 2018 to various executives through random sampling techniques. At the end of the exercise, we received 242 completed responses from the executives, representing 242 subsidiaries for the analysis. This represents a response rate of 62.86% and is good for studies of such nature. According to Saunders, et al. [128], a response rate from 50–70% is good for a research study. The rate signifies the efforts put across by the research team to exhibit the importance of the study to the executives of the multinational enterprises subsidiaries. We carefully scrutinized the retrieved questionnaires and removed 13 questionnaires that were discovered to be incomplete. Finally, we were left with 229 questionnaires, representing a response rate of 59.48%.

5. Empirical Result

5.1. Reliability and Validity

Before the hypothesis verification, we carry out test of internal reliability and validity to verify the stability and consistency of the measurement. We use Cronbach's α coefficient to measure the inner stability and consistency. Table 1 shows the reliability test of the construct: on-the-job training & development (0.749); off-the-job training & development (0.719); explicit knowledge received (0.696); tacit knowledge received (0.694); and firm innovative performance (0.861). The Cronbach's α coefficient for explicit knowledge received and tacit knowledge received are very close to 0.7 (as lower than 0.6 is not recommended), the other values are all higher than 0.7, indicating a high internal consistency for the measurement.

Variable	Number of Items	Cronbach's α	КМО	AVE	Composite Reliability
1. On-the-Job Training & Development	4	0.749	0.754	0.572	0.842
2. Off-the-Job Training & Development	4	0.719	0.746	0.543	0.826
3. Explicit Knowledge Received	4	0.696	0.737	0.524	0.815
4. Tacit Knowledge Received	4	0.694	0.712	0.525	0.814
5. Firm Innovative Performance	5	0.861	0.856	0.643	0.900

Table 1. Construct reliability and validity.

We also employ exploratory factor analysis to evaluate the structural validity of the measurement. Items with a factor loading lower than 0.6 were removed. The results of Kaiser-Meyer-Olkin (KMO) values are as follows: on-the-job training & development (0.754); off-the-job training & development (0.746); explicit knowledge received (0.737); tacit knowledge received (0.712); firm innovative performance (0.856), see Table 1. The KMO values of all variables in this test are above 0.7; therefore, the results meet the requirement for exploratory factor analysis. The values of all variables also suggest that the construct validity of the model is high.

We also calculate the average variance extracted value (AVE) and the composite reliability (CR) to assess the main variables. Results indicate as follows: on-the-job training & development (AVE 0.572, CR 0.842); off-the-job training & development (AVE 0.543, CR 0.826); explicit knowledge received (AVE 0.524, CR 0.815); tacit knowledge received (AVE 0.525, CR 0.814); firm innovative performance (AVE 0.643, CR 0.900), see Table 1. All AVE values are above 0.5, which indicates the high convergent validity of the variables. Also, all composite reliability values are greater than 0.6, suggesting higher level of satisfactory and the quality of the model. In addition, Table 2 shows result of all the square roots of AVE analysis. It can easily be seen that the square roots of AVE are above 0.5 and, moreover are above

the correlation coefficients for each construct. This indicates that discrimination validity between latent variables is good.

5.2. Descriptive Statistics and Correlations

In this paper, we conducted a descriptive statistical analysis with all the variables. Precisely, the data of each variable is calculated by the average value of its items (the total score of the item to which the variable belongs is divided by the number of items).

Table 2 shows the means, standard deviations, square roots of average variance extracted (AVE) and correlation matrix for all the variables in the study. The relationships among variables are noteworthy. The mean values of on-the-job training and development and off-the-job training and development are 4.772 and 4.828 respectively. This suggests that subsidiaries attach importance to human resource management practices. The average values of explicit and tacit knowledge received are 4.814 and 4.771 respectively, which indicates that the executives' pay crucial attention to build knowledge stock towards performance. Firm innovative performance records a mean value of 4.644.

Variable	1	2	3	4	5	6	7	8	9
1. On-the-Job Training & Development	(0.756)								
2. Off-the-Job Training & Development	0.543 **	(0.737)							
3. Explicit Knowledge Received	0.142 *	0.273 **	(0.724)						
4. Tacit Knowledge Received	0.065	0.077	0.205 **	(0.725)					
5. Firm Innovative Performance	0.329 **	0.422 **	0.170 *	-0.007	(0.802)				
6. Firm Age	0.058	0.079	0.072	0.113	0.005	1			
7. Firm Size	-0.047	0.046	0.082	0.024	0.242 **	0.293 **	1		
8. Service	-0.062	-0.113	-0.062	-0.005	-0.170 *	-0.117	-0.305 **	1	
9. R&D Intensity	0.152 *	0.139 *	0.036	-0.076	0.310 **	-0.012	-0.042	0.074	1
Mean	4.772	4.828	4.814	4.771	4.644	2.729	2.991	0.568	2.035
S.D.	0.981	0.948	0.938	0.853	1.056	1.041	1.417	0.496	0.655

Table 2. Descriptive statistics and correlation matrix for all study variables.

Note: * p < 0.05 and ** p < 0.01; (two-tailed, N = 229). Data in parentheses are square roots of average variance extracted (AVE).

Variables —	Dependent Variable: Firm Innovative Performance								
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Firm Size	0.239 ***	0.266 ***	0.239 ***	0.222 ***	0.219 ***	0.247 ***	0.222 ***	0.216 ***	0.232 ***
Firm Age	-0.077	-0.099	-0.104	-0.093	-0.082	-0.099	-0.084	-0.087	-0.091
Service	-0.129 *	-0.102	-0.086	-0.078	-0.092	-0.083	-0.091	-0.077	-0.104
R&D Intensity	0.329 ***	0.281 ***	0.274 ***	0.247 ***	0.248 ***	0.255 ***	0.261 ***	0.237 ***	0.275 ***
On-the-Job training		0.300 ***		0.261 ***		0.292 ***	0.248 ***		
Off-the-job training			0.372 ***		0.394 ***			0.391 ***	0.367 ***
Tacit Knowledge Received						-0.020		-0.019	
Explicit Knowledge Received							0.106		0.062
Knowledge Transfer Received				0.034	-0.001				
On-the-job × Knowledge Transfer Received				0.225 ***					
Off-the-job \times Knowledge Transfer Received					0.224 ***				
On-the-job × Tacit Knowledge Received						0.155 **			
On-the-job \times Explicit Knowledge Received							0.205 ***		
Off-the-job × Tacit Knowledge Received								0.171 **	
Off-the-job \times Explicit Knowledge Received									0.196 ***
R^2	0.166	0.251	0.298	0.294	0.342	0.267	0.294	0.320	0.332
F	12.368 ***	16.286 ***	20.400 ***	14.587 ***	17.938 ***	12.879 ***	14.546 ***	16.357 ***	17.218 ***

Table 3. Results of hierarchical linear modeling analysis.

Note: *** *p* < 0.001, ** *p* < 0.01, * *p* < 0.05. (N = 229).

5.3. Results

In this study, we employ the hierarchical linear modeling (HLM) to perform hypothesis testing. Since our variables for the study include variables at different organizational level, hierarchical linear modeling (HLM) is considered to be an appropriate estimation technique to test the effects of the various variables. This modeling permits researchers to regulate for non-independence observations while also examining the links among variables measured at different levels of analysis, capturing covariate effects that vary within and among higher-order clusters [129–131]. The approach also helps researchers to overcome challenges and avoid problems associated with other alternatives, such as aggregating scores at the higher level or failing to address the interdependence of disaggregated observations that can give rise to differences in error variances across the respondents as well as correlated disturbances [131,132].

Table 3 presents the results of hierarchical linear modeling regression. Model 1 is a linear regression model with only control variables; Model 2 & Model 3 are regression models containing control variables and independent variables (On-the-Job & Off-the-job training and development); Models 4–9 encompass control variables, independent variables, moderator variables, and Product terms of independent variables and moderator variable (on-the-job × Knowledge Transfer Received; off-the-job × Knowledge Received; on-the-job × Knowledge Received; on-the-job × Tacit Knowledge Received; on-the-job × Explicit Knowledge Received; off-the-job × Tacit Knowledge Received; off-the-job × Explicit Knowledge Received).

5.4. Hypotheses Testing

Table 3 best illustrates the results of testing hypothesis 1a, 1b, 2a, 2b, 3a, 3b, 4a and 4b, after controlling for firm size, firm age, service and R&D intensity.

Hypothesis 1a predicts that on-the-Job training and development has significant positive effect on firm innovative performance. Examining the results in Model 2, we noted that the variable on-the-job training and development has a positive impact on firm innovative performance (p < 0.001), and that its coefficient estimate is positive. Hypothesis 1a is therefore confirmed.

Hypothesis 1b states that off-the-job training and development has significant positive effect on firm innovative performance. According to Model 3 in Table 3, the effect of off-the-job training and development is positively related to firm innovative performance, which is statistically significant (p < 0.001), providing support for this hypothesis.

Hypotheses 2a and 2b posit that knowledge transfer received moderates the effects of on-the-job training and development and firm innovative performance and off-the-job training and development and firm innovative performance respectively. From Model 4 and 5, the moderating effects of knowledge transfer received on the relationship on-the-job training and development and firm innovative performance, and off-the-job training and development and firm innovative performance are statistically significant (p < 0.001). Thus, hypotheses 2a and 2b are supported.

Hypothesis 3a proposes that tacit knowledge moderates the effects of on-the-the job training and development and firm innovative performance. According to Table 3, Model 6, the coefficient of moderating effect of tacit knowledge of the relationship between on-the-job training and development and firm innovative performance is positive and statistically significant (p < 0.01). Therefore, hypothesis 3a is supported.

Hypotheses 3b states that explicit knowledge moderates the effects of on-the-job training and development and firm innovative performance. The results from Model 7 reveal a positive coefficient of explicit knowledge influences on on-the-job training and development and firm innovative performance at (p < 0.001), significant level.

Hypothesis 4a posits that tacit knowledge received moderates the effects of off-the-job training and development and firm innovative performance. This is largely supported (Model 8; Table 3), at (p < 0.01) significant level. This indicates that tacit knowledge received directly influence the subsidiary innovative performance.

Hypothesis 4b predicts that explicit knowledge received moderates the effects of off-the-job training and development and firm innovative performance. The interaction effect between the variables provides a significant level (p < 0.001, model 9, Table 3).

To show the above adjustment effects more intuitively, the adjustment effects diagrams are presented in Figures 2–5 below. From the figures, we can see that Higher TKR and Higher EKR positively adjust the relationship between on-the-job-training and development and off-the-job-training and development and firm innovation performance, respectively. Specifically, TKR and EKR can bring higher firm innovation performance to the above two training and development modes (on-the-job and off-the-job).



On-the-Job training and development

Figure 2. On-the-job training and development and firm innovation performance: Moderating effect of tacit knowledge received.



On-the-Job training and development

Figure 3. On-the-job training and development and firm innovation performance: Moderating effect of explicit knowledge received.



Figure 4. Off-the-job training and development and firm innovation performance: Moderating effect of tacit knowledge received.



Off-the-Job training and development



6. Discussion

Investment in human capital through training and development is a key drive for organizational development and prosperity. For modern organizations to strive in this turbulent market environment, training and development of the workforce is regarded by many scholars and practitioners to be a conduit to boost creativity and innovation to influence innovative performance. From the extant literature, not many studies have been conducted on the effects of training and development on firm innovative performance in emerging economies, and other facilitating factors impacting upon training and development and subsequently on firm innovative performance. In this paper, we constructed a theoretical model of training and development and firm innovative performance. First, we examined the impact of on-the-job-training and development and off-the-job training and development on firm innovative performance. Specifically, we explored the moderating role of knowledge transfer received (tacit and explicit knowledge) in the training and development and firm innovative performance link in foreign MNEs subsidiary.

Our research complements the literature in several ways: First, this research responded to calls from researchers [25] for empirical research about training and development and firm innovative performance. Our results from the hierarchical linear modeling suggest that both on-the-job training

and development and off-the-job training and development have an influence on the firm innovative performance. This result indicates that investments in workforce skills and capabilities through the extensive use of training and development practices contribute to subsidiary innovation performance. Workforce ability, skills, and motivation constitutes the firm's absorptive capability, which can aid in creativity and innovation. Our results extend prior studies, as scholars often concentrate on training to the detriment of development [88]. The findings make contribution to the human resource management literature, particularly training and development, laying foundation on the effectiveness of different types of training and development on firm innovative performance.

Second, the empirical results of the study demonstrate that the moderating effect of tacit and explicit knowledge received on the relationship between both on-the-job training and development and off-the-job training and development and firm innovative performance are stronger. The finding contributes to the firm's knowledge-based view literature by enriching and providing strong empirical support for the theoretical preposition that knowledge transfer serves as a catalyst for innovation performance [40].

Third, the study connects three distinct literatures of training and development, knowledge management and innovation management to provide a guide as to how firms should achieve better innovation performance. Our finding demonstrates the interactions between types of knowledge transfer received and types of training and development in improving firm innovative performance. Thus, this finding has not only conceptualized the interaction linkages among the variables, but also given a more specific detail by dividing types of training and development as on-the-job and off-the-job, types of knowledge transfer received as tacit and explicit. Therefore, the proposed model might be used as an alternative theoretical model for evaluating training and development, knowledge transfer received and innovation performance in future studies. The results enrich the existing innovation management literature. As innovation plays significant role in firm's sustainability and competitive advantage.

This paper presents significant strategies and practical suggestions for foreign MNEs subsidiary and policy makers. First, these findings suggest that MNEs subsidiary executives need to continuously embrace on-the-job and off-the-job training and development concepts in their vision and strategic goals and act to allocate budget for its implementation. However, executives should not rush into rapid training and development programs, instead, they should choose strategic programs that are consistent with the firm's innovation agenda. The programs can be devised depending upon the needs of the workforce or individual employees in order to achieve better innovation performance. Second, executives can improve the innovation performance of their firms by applying training and development and knowledge transfer received. The relationship between training and development, knowledge transfer received and firm innovative performance may provide a guide as to how firms should achieve better innovation performance. MNEs subsidiary executives should create an enabling environment which is conducive enough to encourage trained workforce to apply their knowledge towards business development and sustainability. Third, MNEs subsidiary executives should strengthen their cordial relationship with parent companies and other subsidiaries on the intra or inter firm network to facilitate the free flow of knowledge transfer from other parts to promote innovation efficiency. In addition, executives can also focus on open innovation or search external knowledge related to innovation to augment the existing knowledge stock to build innovation capabilities. Thus, the firm's innovation performance will be improved and the overall performance will be enhanced. Fourth, policy makers need to create regulatory framework on training and development and encourage executives to pay attention to it in order to spark creativity and innovation to boost the country innovation performance on the global stage. Five, also, policy makers should offer incentives in the form of subsidies, tax holiday among others to help firms to develop strong innovation capabilities.

7. Conclusions

The ever-changing global business dynamics keep on pressurizing international business practitioners to position themselves for survival and growth. Training and development of the workforce have been reported to have effects on business growth and survival in this turbulent market environment. This paper set out to investigate the ways training and development impacts on firm innovative performance as well as the moderating role of knowledge transfer received on training and development and firm innovative performance, using subsidiaries of MNEs operating in China. Through a random sampling approach, 229 executives from foreign subsidiaries of MNEs responded to our questionnaire survey. The results of the study reveal that both on-the-job training and development and off-the-job training and development have an influence on the firm innovative performance. Also, the empirical results of the study demonstrate that the moderating effect of tacit and explicit knowledge received on the relationship between both on-the-job training and development and off-the-job training and development and firm innovative performance are stronger. The study also demonstrates that subsidiaries create relationships with headquarters and other partners, which can help to reduce uncertainty of external shock emanating from the environment. Our study enriches the existing international business and human resource management literatures on training and development, knowledge transfer received and innovation performance vastly and can contribute to sustainability of MNEs subsidiary.

8. Limitations and Future Research Opportunities

Despite the contributions of this study, there are quite a few limitations that future researchers can take up for investigation.

First, we focused our attention on foreign subsidiaries operating in a single host country (i.e., China). In future research, it would be useful to extend the investigation by looking at the broader picture to include other host countries. In addition, we did not include local subsidiaries in our sample size, it would be interesting for future researchers to compare foreign subsidiaries and local subsidiaries in their training and development policies towards firm innovative performance. Second, the findings of the study are merely based on the respondent's honesty through the questionnaire. Future research should consider listed foreign subsidiaries so that their information could be verified. Third, the study uses a cross-sectional design, which may not agreeably reflect the elucidation of casual connection among the variables. Future research should consider longitudinal research design to ascertain how these variables changes over time and the relationship among them.

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Appendix A

1. On-The-Job Training and Development

We give our workforces opportunity to work closely with co-workers with different skills.

We allow the supervision team to call all workforce together to discuss or tackle challenging tasks. We give employees step by step training to learn from their trial and error.

We make available job instructions, professional magazines and journals relating to our job to employees.

2. Off-The-Job Training and Development

We allow employees to attend professional conferences or workshop related to their job or profession.

We mostly invite experts to come around and show employees how to use new pieces of equipment purchase by the company.

We organize workshops/seminars to sensitize employees on new information.

We organize simulation exercises to employees to upgrade their skills and capabilities.

3. Explicit Knowledge Received

Our company receive information on new technology from our parent company.

Our company receive new product knowledge from our parent company.

Our company receive know-how related to the market (e.g., customers, supplies, competitors, regulators) from our parent company.

Our company receive management systems and practices knowledge from our parent company.

4. Tacit Knowledge Received

Competitive behavior information from our parent company are shared with us. Market operation knowledge from our parent company are shared with us. Knowledge about foreign cultures and tastes are given to us from our parent company. Relationships related know-how and skills from our parent company are shared with us.

5. Firm Innovative Performance

To compare to key competitors, our company number of new products/services have increased. To compare to key competitors, our company ratio of new products sales to total sales have increased.

To compare to key competitors, our company speed of new product/service development is better. To compare to key competitors, our company number of patent applications have increased. To compare to key competitors, our company novelty of new product/service is better.

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