

The Impact of the Exchange of Sustainable Technological HR Innovation Knowledge within *Chaebols* on the Performance of Global Subsidiaries

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Abstract

Purpose – On the basis of knowledge transfer theory, we empirically explored how three types of human resource (HR) innovation knowledge exchange within a *Chaebol* drive the global subsidiary performance of the headquarters (HQ) of a *Chaebol*'s globally affiliated companies.

Design/methodology – Using a sample of 176 Korean HQ firms of the top 53 *Chaebols* and 1,061 of their foreign manufacturing subsidiaries ($n = 1,061$), we tested the relationship between the exchange of explorative and exploitative sustainable HR innovation knowledge among HQ firms of *Chaebols*, their subsequent transfer of technical HR knowledge via technical schemas, and the subsequent impact on the global subsidiary performance.

Findings – The *Chaebols*' decisions about the three strategic knowledge management options (i.e., the degree of exchange of explorative and exploitative technological HR innovation knowledge and the extent of HQ-subsidary HR knowledge transfer) have highly significant relationships with the global subsidiary performance. The results help explain the conditions under which the explorative versus exchange of exploitative sustainable HR innovation knowledge pays off by showing the moderating role of the degree of HQ-to-subsidary technical HR knowledge transfer, at least in the case of the *Chaebol* as one representative type of the emerging-market business groups.

Originality/value – As the first of its kind in the field of sustainable HR innovation knowledge management at the business group level, the present study makes a clear contribution in demonstrating how the performance of *Chaebols*' manufacturing subsidiaries depends greatly on their strategy for management of knowledge, as reflected in the choices they make about sharing both explorative and exploitative sustainable HR innovation knowledge among HQ firms and the subsequent transfer of HQ's sustainable HR innovation knowledge to the foreign subsidiaries.

Keywords: Explorative and Exploitative Exchange of Sustainable Human Resource Innovation Knowledge, Foreign Subsidiary Performance, Headquarters-to-Subsidiary Technical Human Resource Knowledge Transfer, Korean *Chaebols*

JEL Classifications: C31, F23, O15, Q56

1. Introduction

This research is concerned with the patterns of the exchange of sustainable technology human resource (HR) innovation knowledge and the transfer of technical HR knowledge among member firms of a *Chaebol*, i.e., a large Korean business group of sister group-affiliated companies (GACs) that are clustered under a single administrative control tower

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and financial controlling entity and are frequently run by one family and cross-shareholdings (Lee et al., 2010). The study further explores the impact of these patterns on the performance of the *Chaebols'* subsidiaries. At present, the transfer of sustainable HR innovation knowledge in multifaceted firms is becoming increasingly critical in organizations (Muñoz-Pascual et al., 2020). Those that are able to transfer sustainable HR innovation knowledge effectively from one unit to another are more productive and more likely to survive than those that are less adept. For example, previous studies suggest that multinational corporations (MNCs) may survive and prosper because of their ability to transfer and exploit sustainable HR innovation knowledge more effectively and efficiently in the intra-organizational context than through the external market mechanism (Lee et al., 2014; Lee et al., 2014; Lee et al., 2020).

Sustainable technological HR innovation knowledge refers to sustainable (environmental) innovation technology and know-how that are based on networked human-based innovative knowledge and skills (Adams et al., 2016; Cillo et al., 2019). In this vein, successful sustainable HR innovation knowledge transfer is difficult to achieve. However, organizations can realize superior performance by attaining sustainable knowledge transfer (Muñoz-Pascual et al., 2020). The efficacy and efficiency of the exchange of sustainable HR innovation knowledge is crucial within complex organizations such as *Chaebols*, especially in the recent decade, because the phenomena of sustainable HR innovation knowledge transfer among learning units have become important drivers of value creation.

Sustainable HR innovation knowledge flows occur among units of diversified domestic firms as well as among units of diversified MNCs (c.f. Adams et al., 2016; Argote et al., 2000; Cillo et al., 2019; Lee et al., 2010). Some *Chaebols* have the same HR innovation knowledge exchange patterns as diversified domestic firms, while other *Chaebols* have the same HR innovation knowledge exchange systems as the more complex systems of diversified MNCs (c.f. Cillo et al., 2019; Lee et al., 2010; Lee et al., 2014). We view HR innovation knowledge exchanges in the internationally diversified *Chaebol* as a natural extension of the sustainable HR innovation knowledge transfers that occur among units in the domestic *Chaebol*.

As several international business scholars have suggested, knowledge transfers within an MNC take place in the context of an intra-organizational “network” of different units (Buckley and Casson, 1976; Gupta and Govindarajan, 2000). A similar pattern of networking of learning members occurs in the intra-*Chaebol* context. Hence, understanding the processes by which these attributes translate into rents calls for finer-grained analyses that focus on networked knowledge exchange among *Chaebol* headquarter (HQ) units and their subsidiaries (Lee et al., 2020).

Within the *Chaebols*, diverse types of business group-level knowledge-creation and knowledge-seeking activities have become a critical organizational strategy. In the face of competition from the sophisticated technologies and managerial strategies of American, European, and Japanese competitors, *Chaebol* groups have pursued the intense exchange of sustainable technological HR innovation knowledge among HQ units, accompanied by deliberate HR knowledge transfer from the HQ unit to its manufacturing subsidiaries (c.f. Adams et al., 2016; Lee et al., 2020). As a result, an intertwined and well-protected organizational learning network has evolved as a way of, first, syndicating sustainable technological HR innovation knowledge across HQ units of the *Chaebol*, second, amalgamating technological HR innovation knowledge within each HQ unit, and, third, transferring this amalgamated knowledge from the HQ firm to its subsidiaries. We believe that these networked patterns of knowledge exchange among the HQ units of the *Chaebol* and the subsequent transfer of knowledge to their foreign manufacturing subsidiaries lead to the creation of sustainable competitive advantages that, in turn, create rent streams and enhance the global performance of GACs within the group.

The unique characteristics of these GACs and their subsidiaries have been the subject of considerable scholarly attention. Management scholars have studied the *Chaebol* phenomenon using various lenses and with different levels of granularity. *Chaebol* literature has four main streams, each explaining some facet of our phenomenon of interest: sociology, political economics, transaction costs theory, and the resource-based view of the firm. For instance, Granovetter (1994) used the sociological perspective to depict the *Chaebols* as networks of interconnected member firms, unified in purpose and coordinated in decisions by the norms and codes of behavior among them. This sociological perspective supports our networked HR knowledge transfer argument. A political economics lens (Ghemawat and Khanna, 1998) proposes why *Chaebols* would pursue intra-group sustainable HR innovation knowledge exchange so extensively. As we see it, closely tied interconnected HR innovation knowledge exchange among learning members within the group creates rents for that group. Next, transaction-cost theory (Khanna and Rivkin, 2001) can explain why *Chaebols* should focus on intra-group HR innovation knowledge exchange, that is, to overcome the market imperfections and high transaction costs in less-developed markets. Finally, the resource-based view has been used to explain *Chaebol* performance. Chang and Hong's (2000) empirical analysis argued that *Chaebols* create value through the vertical sharing of intangible and tangible resources at the group level, thereby creating idiosyncratic value.

Despite the scholastic attention on the *Chaebol* phenomenon, no study has been conducted on the management of sustainable HR innovation knowledge at the business group level to date. Hence, the present study makes a clear contribution by determining that the performance of *Chaebols'* manufacturing subsidiaries depends largely on their strategy for the management of knowledge. This dependence is reflected in the choices these businesses make about sharing their explorative and exploitative sustainable HR innovation knowledge among HQ firms and the subsequent transfer of HQ's sustainable HR innovation knowledge to foreign subsidiaries.

The purpose of this study is to explore the knowledge transfers among *Chaebol* units, specifically sustainable HR innovation knowledge-exchange processes among Korean HQ firms belonging to *Chaebols*, the transfer of HR knowledge from HQ units to their respective foreign manufacturing subsidiaries, and the impact of this HR knowledge transfer on the performance of the foreign subsidiaries. Therefore, we explore the following research questions:

- 1) What are the patterns of the networked exchange of sustainable technological HR innovation knowledge among the HQ firms of the *Chaebol*, and how are they related to the performance of their foreign manufacturing subsidiaries?
- 2) What are the patterns of the deliberate transfer of technical HR knowledge by HQ firms to their foreign manufacturing subsidiaries, and how are they related to the performance of the foreign subsidiaries?

2. Theoretical Background and Hypotheses

March (1991) categorized organizational learning strategies as exploratory or exploitative. Moreover, the researcher posited the importance of maintaining an appropriate balance between these two approaches, in which a firm can pursue ecological learning about its environment. Exploration and exploitation require various structures, processes, and capabilities. Furthermore, they have differing impacts on the organizational performance. The self-reinforcing nature of excessive exploitative learning may cause core capabilities to be changed into core rigidities in the face of environmental changes. To counter an excessive

focus on exploitation, which results in organizational myopia and competency traps, business groups must undertake exploratory learning (Ghemawat and Costa, 1993; Holmqvist, 2004; Leonard-Barton, 1995; Levitt and March, 1988; Winter and Szulanski, 2001). However, focusing predominately on explorative learning sacrifices the short-term performance for this long-term adaptiveness.

2.1. Knowledge Exchange among HQ Units and Their Manufacturing Subsidiaries' Performance

Building on March's (1991) study, He and Wong (2004) investigated the explorative and exploitative technological innovations at the firm level. Furthermore, Jansen et al. (2005) researched explorative and exploitative innovations at the multi-unit level of diversified firms. These studies showed that in a diversified firm, technological innovations evolve via explorative and exploitative knowledge flows across—with subsequent diffusion within—the units of a multi-unit organization. Thus, both types of innovation knowledge exchange among HQ firms lead to the creation of idiosyncratic and heterogeneous resources (Ahuja and Lampert, 2001). According to He and Wong (2004), the exchanges will have differing impacts on firm performance. If we examine HR technology management and sustainability in the *Chaebol* context, technological knowledge exchange should similarly lead to both explorative and exploitative sustainable HR innovations. In this sense, the general objective of the exchange of exploitative sustainable HR innovation knowledge among GACs is to improve the eco-efficient productivity and quality of operating functions and reduce costs through improved environmental processes. Meanwhile, the general goals of the exchange of explorative sustainable HR innovation knowledge among peer GACs are to enter new environmental technology fields and introduce new generations of eco-efficient products.

Explorative innovations lie as the core factor of entrepreneurial activities and wealth creation. They serve as the fundamental elements of novel technological innovation trajectories and paradigms. Moreover, they are a crucial part of the creative destruction processes, in which the extant techniques and approaches can be replaced by novel innovative technologies and products. Such exploratory innovations help units counter the obsolescence of products and services. Large firms that are successful at exploratory learning and knowledge exchange are able to generate significant technological breakthroughs and reinvent themselves while maintaining technological parity or leadership in their industries, thus leading to a higher level of performance (Barney, 1991; Wernerfelt, 1984).

To extend this logic to *Chaebols*, these firms need the exchange of explorative sustainable technological HR knowledge among HQ units if they are to reinvent themselves continually and retain technological leadership in their industries. As a *Chaebol's* GACs share their explorative sustainable HR innovations with peer GACs within their group, the exchange builds shared and syndicated group-level sustainable HR knowledge stocks and absorptive capacity. As these shared and intertwined sustainable HR knowledge assets are transferred to GACs' foreign manufacturing subsidiaries, the exchange has the potential to enhance the subsidiaries' sustainable competitiveness, thus leading them to perform at a higher level than their local competitors. Therefore, the exchange of explorative sustainable HR knowledge among the *Chaebol's* HQ firms generates innovative competencies for the GACs, which, on absorption, can be converted to new sustainable competitive advantages by the foreign manufacturing subsidiaries and trigger enhanced performance. Hence:

Hypothesis 1 (H1). *The more extensive the sharing of **explorative** sustainable technological HR innovation knowledge among HQ units of the focal GAC is, the more likely the performance of the foreign manufacturing subsidiaries of that GAC is to increase.*

However, scholars have also argued that increasing exploration will decrease long-term performance. March (2006) argued that “ventures in more complex explorations seem often to lead to huge mistakes and thus unlikely to be sustained by adaptive processes.” Empirical studies also show that exploration-oriented corporate venture units have a high level of correlation with negative longitudinal performance (Hill and Birkinshaw, 2008).

The complexities of the *Chaebol* structure accentuate this problem (Lee et al., 2010; Lee et al., 2014), especially in the context of its technological management and sustainability. In the *Chaebol* context, the exchange of explorative sustainable HR innovation knowledge may be considerably delayed given the multiplicity of interactions among HQ units and the patterns of interactions with HQ subsidiaries. Enhancing the performance of *Chaebol* firms through explorative sustainable HR innovation knowledge may require a long-term horizon. Hence:

Alternative Hypothesis 1A (H1A). *The more extensive the sharing of explorative sustainable technological HR innovation knowledge among HQ units of the focal GAC is, the more likely the performance of foreign manufacturing subsidiaries of that GAC is to decrease.*

Exploitative sustainable HR innovation knowledge exchange can be deployed to enhance the core competencies of GACs, which can, in turn, boost the competencies and performance of their subsidiaries in the short term. Consequently:

Hypothesis 2 (H2). *The performance of the foreign manufacturing subsidiaries of a focal GAC is more likely to increase with the more extensive exchange of exploitative sustainable technological HR innovation knowledge among the focal GAC and other HQ units of GACs within its Chaebol.*

2.2. Transfer of Technical HR Knowledge from HQ Unit to Manufacturing Subsidiary

In the international business arena, the transfer of firm-specific resources, especially knowledge, has been posited as a key success factor for MNCs (Kogut and Zander, 1993). Prior research has also supported the theory that a positive association exists between knowledge transfer from parents to foreign subsidiaries and the performance of those subsidiaries (Lyles and Salk, 1996).

Such transfers take place in two broad formats. First, informal, “osmotic” transfer takes place through being absorbed during the myriad of constant interactions between members of GAC HQ units and their subsidiaries (which was not focused in this study). Second, through deliberate transfers of documents, guidelines, policies, interventions, and directives from the HQ, technical “schemas,” such as product designs, process designs, best practices, and management processes, are conveyed to the subsidiaries (Lee et al., 2010). This study focuses on the deliberate transfer of such technical schemas, especially in the context of technological management and sustainability within *Chaebols*.

Galbraith (1990) reported that numerous firms find intra-firm knowledge transfer much more difficult than expected. Therefore, knowledge assets in the form of organizational practices and technologies are important for MNC success; however, they often do not transfer easily, as knowledge assets can be “sticky” (Jensen and Szulanski, 2004; Szulanski, 1996). In addition to stickiness, the tacitness of knowledge also prevents knowledge transfer within MNCs (Kogut and Zander, 1993). In the case of foreign subsidiaries, the liability of foreignness may further dampen the transfer of knowledge to subsidiaries (Zaheer, 1995).

The flow of knowledge from HQ to manufacturing subsidiaries is by no means guaranteed,

and obstacles, such as tacitness, stickiness, and foreignness, need to be overcome by deliberate knowledge transfer. In reality, within the *Chaebol*, this knowledge transfer can occur through the sharing of globally networked human-based innovative knowledge/skills (e.g., sharing of innovative knowledge/skills among parent-country nationals (PCNs)/host-country nationals (HCNs) and transnational teams) between HQ and manufacturing subsidiaries, especially in the vein of sustainable, environmental technology management (Lee et al., 2014; Lee et al., 2020). To the extent that firms are able to overcome these obstacles, the subsidiaries will have new insights to develop competencies in sustainable HR technology management that will boost performance. Thus:

Hypothesis 3 (H3). *The greater the degree of technical HR knowledge transfer between the HQ unit of a focal GAC and its foreign manufacturing subsidiaries (to reduce the HR knowledge transfer barriers) is, the better the performance of that focal GAC's subsidiaries becomes.*

2.3. Moderating Effect of Transfer of HR Knowledge to Subsidiaries

The long-term prosperity of firms operating in cross-border environments seems increasingly predicated on their ability to identify and transfer HR knowledge assets so that the firm can properly exploit those assets (Lee et al., 2020; Teece et al., 1997; Zander and Kogut, 1995). This scenario is even more relevant for MNCs, including multinational GACs, where technology and corporate know-how are frequently transferred across borders, either between the parent firm and its subsidiaries or among subsidiaries through the sharing of globally networked human-based innovative knowledge and skills (Lee et al., 2014). In this respect, the issue of the transfer of HR knowledge assets takes on greater importance, with some scholars placing the leverage of knowledge across borders at the center of the theory of the MNC (Winter, 1995).

Thus, we argue that HR knowledge transfer is a moderating variable. If sustainable technological HR innovation knowledge cannot flow into foreign manufacturing subsidiaries effectively and efficiently from the GAC HQ, the opportunities for exploiting this HR knowledge will be inhibited. The performance of the foreign subsidiaries will be enhanced only if GACs can overcome the barriers to the transfer of explorative and exploitative sustainable HR innovation knowledge to foreign subsidiaries. Accordingly, we predict that:

Hypothesis 4a (H4a). *The degree of HQ's HR knowledge transfer to manufacturing subsidiaries (to reduce the barriers) positively moderates the degree to which the exchange of **explorative** sustainable technological HR innovation knowledge among HQ units affects subsidiary performance.*

Hypothesis 4b (H4b). *The degree of HQ's HR knowledge transfer to manufacturing subsidiaries (to reduce the barriers) positively moderates the degree to which the exchange of **exploitative** sustainable technological HR innovation knowledge among HQ units affects subsidiary performance.*

From the theoretical background and hypotheses above, we created a research model (shown in Fig. 1, which displays the HR knowledge exchanges and transfer pattern we discussed above, and Fig. 2, which shows the signs of the expected relationships, including interactions) for the effects of the exchange of explorative and exploitative sustainable HR innovation knowledge among GACs within the *Chaebol* and its impact on foreign manufacturing subsidiary performance, as moderated by the HQ unit transfer of HR knowledge to the subsidiaries.

Fig. 1. Depiction of the basic variables in the study

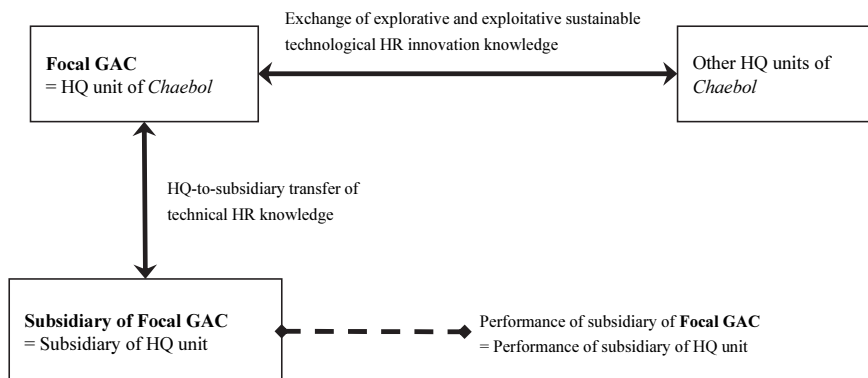
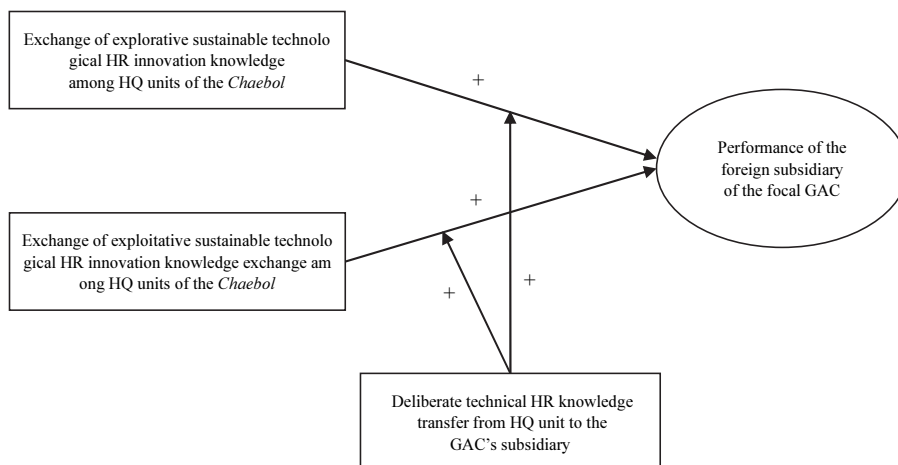


Fig. 2. Research model of explorative vs. exploitative sustainable technological HR innovation knowledge sharing within the Chaebol and its impact on subsidiary performance



3. Methods

3.1. Research Design and Methodology

We selected the survey method as our research design based on detailed, face-to-face, structured interviews with senior executives/directors and high-ranking managers in South Korea's 25 largest *Chaebol* firms and their foreign subsidiaries. With the support of a former high-ranking member of the South Korean government, we were able to conduct our interviews with the support of current senior Korean government officials, thus leading to a conspicuous 89 percent response rate from senior managers of all major *Chaebols* and their foreign subsidiaries.

3.2. Selection of Sample

Our sample consisted of 176 manufacturing GACs in 53 Korean business groups that had undertaken foreign direct investments (FDIs), together with their 1,061 foreign manufacturing subsidiaries. We collected these data through the two waves of our survey with a time gap of at least six months to nullify the risk of common method bias and reverse causality (Podsakoff et al., 2003). The first wave of our survey was conducted for seven months from December 2016 to June 2017, while the second wave of our survey was conducted for six months from January to June 2018. In line with these two waves of surveys, we used the first wave of our survey data to measure independent and moderating variables. Meanwhile, we used the second wave of survey data to measure a dependent variable. We used the survey data only for our main variables, i.e., independent, moderating, and dependent variables. However, we used the secondary data with various sources for other control variables. Specifically, we collected the financial and accounting information for MNEs from KISVALUE and the Korean FDI information from the Korean Ministry of Economy and Finance, Korea Trade Investment Promotion Agency (KOTRA), and the Financial Supervisory Service's Data Analysis, Retrieval, and Transfer System. Our sample list of 53 Korean business groups included all *Chaebols* that undertook FDIs and were listed in the Korea Fair Trade Commission (KFTC) list of the largest Korean business groups as of 2016. Among the 53 sample business groups, 38 business groups were under the obligatory auditing by the KFTC on cross-subsidizations. These 53 *Chaebols* had a total of 176 HQ businesses, whose sustainable HR innovation knowledge-exchange activity was the focus of our study.

Drawing from the previous literature (Demmerling, 2014; Ellen et al., 2006; Gupta and Govindarajan, 1991a; He and Wong, 2004; Lee et al., 2016; Lee et al., 2010; Lee et al., 2014; Lee et al., 2020), we developed a structured interview-based questionnaire. Our questionnaire was pretested for the face and construct validities with 29 senior executives of the top 25 *Chaebol* companies in the largest Korean business groups. We interviewed these executives and had them identify what they regarded as the most critical parameters of sustainable technological HR innovation management related to the performance of their firms' foreign manufacturing subsidiaries. Their responses showed a very close correspondence between their perceptions of the important technological HR innovation management factors and those found in the existing literature, which were incorporated in the present study.

To maximize our data capture, following prior studies (Lee et al., 2010; Lee et al., 2020), we applied three steps: 1) a face-to-face visit to the respondents at their companies, 2) a short interview with each respondent explaining our project, and 3) direct collection of the complete questionnaire from each respondent. The face-to-face visits to our respondents augmented a response rate close to 90 percent. We visited all 198 firms that were involved in the population. Altogether, we received 176 completed questionnaires, thus representing an 89 percent response rate. Our sample included 176 firms, each from one of 53 Korean business groups, and responses regarding their 1,061 foreign manufacturing subsidiaries. All respondents were members of the top management teams (TMTs) of their respective firms, holding positions such as senior HR managers and chief technical officers (CTOs). Even if we contacted only the TMT members of the *Chaebol* firms, we were able to collect foreign subsidiary-level data, including HQ-subsiary HR knowledge transfer and subsidiary performance. Senior managers who had experience working in host countries or regions helped our TMT respondents answer our questionnaire items.

To check the non-response bias, we used KISValue and KISLINE, which were reliable public databases compiled by the Korea Information Service (KIS). From these KIS databases,

we were able to obtain secondary data with which to compare our respondents to the original population sample with respect to key firm characteristics, such as R&D intensity and total assets, and subsidiary characteristics, such as total investment and age. The mean difference between the respondent group and the non-respondent group regarding those important characteristics of firms and subsidiaries was examined using an unpaired *t*-test. The results demonstrated that all *t* statistics were not significant. Furthermore, Kolmogorow-Smirnov's *D* (the maximum deviation of the frequency distribution of those two samples) was computed to examine whether the two groups were drawn from the same distribution. The test result indicated that all *D* statistics for the above firm and subsidiary characteristics were non-significant. On the basis of these tests, we concluded that the non-response bias was non-significant.

3.3. Variables and Measurement

3.3.1. Dependent Variable

Given the characteristic of a multidimensional construct, a foreign subsidiary's performance should include not only financial measurements but also strategic criteria, e.g., competitive position in the target host market (Dunning, 1988; Lee et al., 2014). Thus, as a continuous variable, the subsidiaries' performance over the previous three years was measured using four items that other scholars have previously applied (e.g., Lee et al., 2014; Luo and Peng, 1999) to their research on the performance of MNCs' subsidiaries. These four items (item factor loadings are in brackets) were 1) after-tax return on assets (ROA) [0.73], 2) after-tax return on investment (ROI) [0.95], 3) sales growth rate [0.94], and 4) competitive position [0.93]. Principal component analysis showed that all items loaded on a single factor with an eigenvalue of 3.68. Moreover, the internal reliability was very high ($\alpha = 0.89$).

Following prior studies (e.g., Lee et al., 2010), respondents rated the performance of a foreign subsidiary on the basis of a five-point Likert scale. The items compared each foreign subsidiary's performance with its major competitors in its local industry of the host market, with 1 being the lowest 20% and 5 being the highest 20% in the industry.

Although foreign subsidiary performance can be measured by three different dimensions, i.e., financial, objective, and perceptual judgements, prior literature suggested that using subjective measures of firm performance relative to competitors is particularly useful in researching emerging market businesses and that these measurements correlate with objective measures with a high degree of reliability (Chandler and Hanks, 1993). We used three-year average estimates to minimize the influence of short-term performance variations and to manage the longer-term effects of sustainable HR innovation knowledge sharing within *Chaebols*.

3.3.2. Independent Variables

Our measurements for the two types of exchange of sustainable technological HR innovation knowledge among GACs within a *Chaebol* were derived from the published work by reputed scholars (Demmerling, 2014; Ellen et al., 2006; Gupta and Govindarajan, 1991a; He and Wong, 2004; Lee et al., 2016; Lee et al., 2010; Lee et al., 2014; Lee et al., 2020). As we needed to apply these scholars' measurements to our study at the level of the intra-group exchange of sustainable HR innovation knowledge among units, we modified their questionnaire items.

A focal GAC's explorative sustainable technological HR innovation knowledge sharing with sister GACs within a *Chaebol* was measured by a four-item scale. We asked TMT

respondents to score the extent of the exchange of explorative sustainable technological HR innovation knowledge with the question, “Over the last five years, for the items below, to what degree has your company given or taken technology/know-how to/from other manufacturing group-affiliated companies within your business group through the sharing of networked human-based innovative knowledge/skills?”

Four items were scaled as follows: “We have provided or received environmental innovation technology/know-how to/from other manufacturing group-affiliated companies for 1) introducing the next generations of eco-efficient products [0.92], 2) opening up new product markets through new environmental technologies [0.70], 3) entering new environmental technology fields with a long-term perspective [0.82], and 4) extending the product range through researching basic or fundamental environmental technologies [0.93].” The numbers in brackets demonstrate the factor loadings. All items loaded on a single factor with an eigenvalue of 1.05. In addition, the internal reliability was high ($\alpha = 0.86$).

A focal GAC’s exchange of exploitative sustainable technological HR innovation knowledge with sister GACs within the *Chaebol* was assessed with the question, “Over the last five years, for the items below, to what degree has your company given or taken technology/know-how to/from other manufacturing group-affiliated companies within your group through the sharing of networked human-based innovative knowledge/skills?”

Four items were scaled as follows: “We have provided or received environmental innovation technology/know-how to/from other manufacturing group-affiliated companies to 1) improve existing eco-efficient product quality [0.82], 2) improve eco-efficient production flexibility [0.88], 3) reduce production cost by incrementally decreasing environmental emissions [0.94], 4) improve yield through enhanced environmental processes [0.91], and 5) reduce material consumption through improved environmental processes [0.78].” All items loaded on a single factor with an eigenvalue of 6.98. Moreover, the internal reliability was very high ($\alpha = 0.90$).

We decided on a five-year period, as prior research has demonstrated that innovation strategy tends to be stable across a number of years (Cao et al., 2009; He and Wong, 2004). While the firms in our sample were of different ages, all were more than five years old. Hence, we could reasonably presume that most of them had been pursuing a stable innovation knowledge-management strategy for five years or longer. After obtaining the post-interview feedback from the pre-test of the 29 executives at the top 25 *Chaebol* firms, we concluded that the five-year time span was a reasonable duration for our study.

3.3.3. Moderating Variable

Our measurement for HR knowledge transfer between a parent company and its foreign manufacturing subsidiary was adapted from prior studies (Demmerling, 2014; Ellen et al., 2006; Gupta and Govindarajan, 1991a; Lee et al., 2016; Lee et al., 2010; Lee et al., 2014). Following the existing research, we focused on the transfer of technical HR knowledge in the form of human-based schemas, such as technical design and procedures. Data on technical HR knowledge transfer between an HQ unit of the GAC and its foreign subsidiaries over the last five years were gathered on four items as follows: 1) eco-efficient product designs [0.85], 2) eco-efficient manufacturing process designs [0.93], 3) environmental management systems [0.76], and 4) environmental managerial practices [0.79]. All items loaded on a single factor with an eigenvalue of 2.58. In addition, the internal reliability was high ($\alpha = 0.85$). For each item, the respondent was asked to indicate on a seven-point Likert scale (ranging from “not at all” to “a very great deal”) the degree to which the parent company engaged in transfers of HR knowledge and know-how to the foreign subsidiary.

3.3.4. Control Variables

We also controlled for other variables that may affect a foreign subsidiary's performance: 1) a GAC's technological knowledge capability base and size; 2) a GAC's foreign subsidiary's age, size, ownership, entry market size, and cultural distance; and 3) firm and industry dummies.

Moreover, according to existing literature (e.g., Buckley and Casson, 1976; Lee et al., 2014), R&D intensity has been recognized as one of the key determinants of MNCs. Intensive R&D activities create intangible assets that generate technological knowledge-based capabilities and can contribute to higher financial performance. When an MNC enters a host country by establishing a foreign subsidiary, the subsidiary becomes the MNC's overseas agent for exploiting its knowledge asset advantages in that host market. These advantages offer the foreign subsidiary with a superior competitive position in the local market, particularly when the parent company is committed to developing a strong position in the host market (Rugman, 1982). Empirical evidence supports this discussion. Mishra and Gobeli (1998) found a positive association between an MNC's possession of intangible assets and its subsidiaries' market value. Hence, we selected a parent company's R&D intensity as a control variable to demonstrate the parent company's technological knowledge base. The average R&D intensity of the previous five years was selected to minimize the influence of short-term R&D variations. The data for the R&D were obtained from the KISValue database. This database is a reliable and popular source of financial data in analyzing the R&D intensity of *Chaebols* (e.g., Chang and Hong, 2000; Lee et al., 2020).

Following prior studies, we also used other control variables, such as GAC size and foreign subsidiary size and age. The measurements of these control variables followed standard practice, with size defined as the total assets. Age was the number of years since the establishment of the subsidiary. A dummy variable was used to measure a subsidiary's ownership mode: a value of 1 was assigned if a Korean parent company owned 95 percent or more of equity; 0 was assigned otherwise. The 95-percent cut-off point has been commonly used in prior studies on partial and full ownership (Hennart, 1991; Gaur et al., 2019). In addition, a foreign subsidiary's entry market size was measured by a host country's GDP per capita. To measure the degree of each subsidiary's cultural distance from HQ, we used Kogut and Singh's (1988) cultural composite index by computing the cultural distance between home (Korea) and host countries on the basis of Hofstede's (1980) four cultural dimensions (i.e., individualism vs. collectivism, power distance, uncertainty avoidance, and masculinity vs. femininity). Furthermore, we controlled for parent firm dummies. On the basis of foreign subsidiaries' local industries in host countries, we also controlled for the industry dummies according to two digits of the Korean Standard Industrial Classification (KSIC) codes.

4. Empirical Results

4.1. Validity Checks

Discriminant validity was established through exploratory and confirmatory factor analyses to verify the distinctiveness of the constructs in this study using all the items from all of the scales. The exploratory factor analysis replicated the intended four-factor structure (including the exchange of explorative and exploitative sustainable HR innovation knowledge, HQ-to-subsiary HR knowledge transfer, and foreign subsidiary performance) to be used in tests of hypotheses. Items loaded on the intended factors, all of which had eigenvalues greater than 1 that supported our four-factor model. Given that this study is based on a

survey, common method bias may emerge. Hence, to nullify such bias, we first collected separate responses with a time lag between answering independent/moderating variables and answering a dependent variable by conducting two waves of surveys by following Podsakoff et al.'s (2003) procedural remedy. Second, we used different sources for control variables by collecting the archival data. Finally, we conducted Harman's one-factor test (Podsakoff and Organ, 1986), in which common method bias was indicated by the emergence of a single factor that explains a dominant portion of the variance in a factor analysis. The results of the one-factor test revealed that the largest factor accounted for only 29.5 percent of 72.4 percent explainable variances, thus indicating an absence of common method variance.

We used confirmatory factor analysis (Wang and Ahmed, 2004) using AMOS 21 to compare the proposed four-factor model with alternative five-factor models. Absolute fit indexes for the proposed four-factor model were acceptable ($\chi^2 = 504.73$, $df = 112$, $p < .001$, GFI = .92, CFI = .94, IFI = .93, RMSEA = .05), and these fit indexes were superior to those for alternative models. All of these results indicated that our four-factor model provided better fit to the data than plausible rival specifications. Moreover, these results revealed that the four scales represented constructs that were not only theoretically but also empirically distinguishable.

4.2. Results

Table 1 presents descriptive statistics and correlation matrix for variables. In addition, to make a diagnosis on any potential multicollinearity among variables, we checked the variance inflation factor (VIF) for each variable; the excess of 10 cut-off limitations signified a multicollinearity problem (Menard, 1995). Our results indicated that the VIFs associated with our variables did not exceed 3.5. Thus, we concluded that our sample had no concern regarding multicollinearity.

Table 1. Descriptive statistics and correlation matrix^a

Variable	Mean	St. dev.	1	2	3	4	5	6	7	8	9	10
1. Subsidiary performance	3.54	0.89										
2. Exploration exchange	4.39	1.42	-0.15**									
3. Exploitation exchange	4.22	1.54	0.13**	0.10**								
4. HQ-subsidiary transfer	5.25	1.17	0.22**	0.12**	-0.00							
5. R&D intensity	0.05	0.07	0.23**	0.01	-0.04	0.03						
6. Parent size	24.76	1.70	0.40**	0.24**	0.10**	0.25**	0.22**					
7. Subsidiary size	10.64	1.97	0.11**	0.10**	0.07*	0.07*	0.06	0.09**				
8. Ownership dummy	0.45	0.50	-0.04	-0.02	0.03	-0.07*	0.07*	-0.05	0.13**			
9. Subsidiary age	9.65	5.02	0.04	0.02	0.02	0.05	0.04	0.16**	0.09**	-0.14**		
10. Host's GDP per capita	9.55	13.54	-0.07*	-0.03	-0.03	-0.04	0.03	0.04	0.06	0.12**	-0.00	
11. Cultural distance	1.81	0.84	-0.05	-0.07	-0.05	-0.05	0.02	-0.00	-0.03	0.04	-0.10**	0.50**

^a n = 1,061. **p<0.01, *p<0.05 (2-tailed).

We carried out multiple regression analyses to investigate the effects of the explorative versus exchange of exploitative sustainable technological HR innovation knowledge on subsidiary performance. Given the relatively high correlation between the exchange of explorative sustainable HR innovation knowledge and HQ-subsidiary HR knowledge transfer, we used centered data to avoid a multicollinearity issue, following Aiken and West's (1991) method of a centered regression analysis. Table 2 shows the results of our multiple regression analyses.

Models A, B, and C of Table 2 all supported Alternative Hypothesis 1A: the exchange of explorative sustainable HR innovation knowledge within the *Chaebol* is negatively and significantly related to subsidiary performance. Therefore, Hypothesis 1 was rejected because of the delay factor, as discussed in the literature (Lee et al., 2020; March, 1991), between the generation of explorative sustainable HR innovation knowledge at HQ and its manifestation in a format that increased subsidiary performance. Furthermore, Models A, B, and C supported Hypothesis 2: the exchange of exploitative sustainable HR innovation knowledge among GAC units is positively and significantly related to enhanced subsidiary performance.

Next, the coefficients for the HQ-subsidary HR knowledge transfer of the schema in Models B and C were both positively and significantly related with subsidiary performance. This outcome supported Hypothesis 3, which posited that increasing technical HR knowledge transfer through technical schemas is beneficial.

The interaction term between the exchange of explorative sustainable HR innovation knowledge and HQ-to-subsidary HR knowledge transfer had a positive coefficient, as predicted in Hypothesis 4a. However, the interaction term between the exchange of exploitative sustainable HR innovation knowledge exchange and HQ-to-subsidary knowledge transfer was negative, which was opposite to the prediction of Hypothesis 3b. How can we reconcile this unexpected result? We discuss this issue in the discussion section below.

Table 2. Regression analyses for sustainable HR innovation knowledge on *Chaebols'* foreign subsidiary performance^a

Variable	Model A	Model B	Model C
Constant	-1.50*** (0.34)	-1.17*** (0.35)	-1.18*** (0.35)
Exploration exchange	-0.09* (0.04)	-0.15*** (0.04)	-0.16*** (0.04)
Exploitation exchange	0.12*** (0.03)	0.14*** (0.03)	0.13*** (0.03)
HQ-sub transfer		0.11*** (0.02)	0.11*** (0.02)
Exploration × HQ-subsidary transfer			0.07*** (0.02)
Exploitation × HQ-subsidary transfer			-0.06*** (0.02)
R&D	1.30*** (0.37)	1.30*** (0.36)	1.37*** (0.36)
Parent company size	0.23*** (0.02)	0.21*** (0.02)	0.21*** (0.02)
Subsidiary size	0.02 (0.01)	0.02 (0.01)	0.02 (0.01)
Ownership	-0.03 (0.05)	-0.02 (0.05)	-0.01 (0.05)
Subsidiary age	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Host country's GDP per capita	-0.008*** (0.002)	-0.008*** (0.002)	-0.008*** (0.002)
Cultural distance	-0.05 (0.04)	-0.05 (0.04)	-0.06 (0.04)
Adjusted R ²	.36	.41	.49
Model F	27.44***	34.10***	43.08***

^a n = 1,061. Unstandardized regression coefficients and standard errors (in parentheses) are shown.

Firm- and industry-fixed effects are included but not reported.

*** p < 0.001, ** p < 0.01, * p < 0.05, †p < 0.10.

Regarding Hypotheses 4a and 4b, Model C tests the moderating effect of HQ-to-subsi- diary HR knowledge transfer on the relationship between sustainable HR innovation knowl- edge-exchange activities and subsidiary performance. In Model C, the interaction term between the exchange of *explorative* sustainable technological HR innovation knowledge and HQ-to- subsidiary HR knowledge transfer is positively and significantly related to subsidiary performance. In contrast, the interaction term between the exchange of *exploitative* sus- tainable technological HR innovation knowledge and HQ-to-subsi- diary HR knowledge transfer is negatively and significantly related to subsidiary performance. Therefore, Hypothesis 3a is supported, whereas Hypothesis 3b is not supported.

In addition, Table 2 reports the following results concerning control variables. First, in all models, the parent company's R&D intensity and the parent company's size were found to have a significant and positive relationship with foreign subsidiary performance. Second, subsidiary size, ownership, and age and cultural distance are insignificantly related to sub- subsidiary performance. Finally, the host country's GDP per capita is negatively and significantly related to foreign subsidiary performance in all models, thus suggesting that the FDI by the *Chaebol's* HQ unit is more likely to be successful in target host countries with lower levels of GDP per capita, such as emerging markets like China.

5. Discussion

5.1. Theoretical and Empirical Implications

In general, the results fit the theory but with two exceptions. First, a negative relationship exists between the exchange of explorative sustainable HR innovation knowledge and subsidiary performance supporting Hypothesis 1A, as opposed to the positive relation forecasted by Hypothesis 1. Second, a negative interaction term exists for the exchange of exploitative sustainable HR innovation knowledge and HQ transfer of technical HR knowledge. We discuss each in turn.

First, the negative effects of the exchange of explorative sustainable HR innovation knowl- edge are an interesting exception. This result provides the contention in the literature that the exchange of exploitative sustainable HR innovation knowledge pays off while the ex- change of explorative sustainable HR innovation knowledge does not (Lee et al., 2010; March, 1991). Alternative Hypothesis 1A is supported, presumably because explorative sustainable technology takes time to flow to subsidiaries. In the case of *Chaebols*, knowledge first needs to be developed "at home," as described in the conventional Vernon product life cycle theory (Collis and Montgomery, 1998). Moreover, if a firm is creating and conducting cutting-edge products, processes, and technology development (Park, 2010; Xiao, Lew and Park, 2021), it will first manufacture those products in the HQ in Korea before passing them along to the subsidiary. All of these steps would take longer than the five-year horizon of the study. Furthermore, passing them along could initially cause *mishaps* in the subsidiary's perfor- mance because it would initially have higher costs and lower efficiency as it copes with the more complicated product lines (Collis and Montgomery, 1998).

Second, the negative interaction effect of the exchange of exploitative sustainable HR innovation knowledge exchange and HQ technical HR knowledge transfer is also another interesting exception. The explanation for this second exception lies in the nature of the HR knowledge that cumulates over time in the HQ unit after sustained HR knowledge exchange activity with other HQ units. In the *Chaebol* case, exchanges of technological HR knowledge among GAC HQ units over time lead to a reservoir of technological HR knowledge in each

HQ unit, from which the subsidiaries derive insight through technological HR knowledge transfer.

The content of the knowledge reservoir that develops in the HQ units is deeply influenced by the nature of HR knowledge shared with other HQ units within the *Chaebol*. Given that technological HR knowledge has two major types, namely, explorative and exploitative, the emergent knowledge reservoir will contain levels of each type relying on the degree of sharing of each type. Conceptually, we can consider the reservoir in terms of the “concentration” of the HR knowledge type. Thus, if much effort goes into sharing only explorative (or exploitative) HR knowledge, the reservoir will become increasingly concentrated with explorative HR knowledge (or exploitative) content. Meanwhile, if much effort is expended on sharing both explorative *and* exploitative HR knowledge, the reservoir will have a highly concentrated knowledge *mix*. If little effort is expended on both types, the knowledge reservoir will be a diluted mix of both types.

Once the GAC HQ establishes the reservoir, it can then decide the degree to which it will transmit schemas to the relevant subsidiary. The nature of the reservoir knowledge directly affects the value to the subsidiary of the schema being transferred. The value of the schema is driven by two components. The first one is the “applicability” or the degree to which a schema matches the subsidiary’s local competitive environment. The second one is the “adaptability” or extent of efforts needed for the schema to be adapted to fit the local environment.

First, we discuss *explorative reservoirs*. Highly explorative reservoirs have coarse-grained, sticky knowledge (Jensen and Szulanski, 2004). The disadvantage is that schemas that are coarse grained are not easily “translated” into routines by the subsidiary. However, the advantage is that these schemas have a more comprehensive application bandwidth and are thus more adaptable for the subsidiary. The translation problem entails delays and expenses (Lee et al., 2010). This issue leads to a negative impact on performance and a need for the GAC HQ to provide assistance with translation. Augmented technical HR transfer effort by HQ will attenuate the negative impact and enhance performance. In sum, intense explorative HR knowledge exchange will be accompanied by decreased subsidiary performance, which is ameliorated by invigorated HQ transfer.

Second, we discuss *exploitative reservoirs*. Highly exploitative reservoirs have schemas that are less sticky and are fine grained. Therefore, the subsidiary can easily be adopting these schemas. However, each schema has the disadvantage of having tapered application bandwidth. Subsidiaries should inevitably compete in their own local environments. Therefore, this scenario cannot guarantee that fine-grained exploitative technological schemas transferred by the GAC HQ will fit the prerequisites of the subsidiary’s local surrounding. If the subsidiary can select from the pool of exploitative schemas at the GAC HQ, it can rapidly adopt and adapt the most suitable schema and reap early benefits. Yet, the more extensively HQ transfers densely exploitative schemas, the more the subsidiary will find itself struggling with disentangling and force fitting schemas that do not fit their local surrounding. Thus, the numerous transfers of exploitative schemas that HQ makes will bring about processing overload, which is deleterious. In sum, the subsidiary will derive early and rapid performance benefit if schema transfer is restricted. However, as GAC HQ transfer increases, the performance can suffer.

5.2. Practical Implications

The present study has four strategic implications for knowledge management. The first one is our result indicating that exploration is not rewarded in subsidiary performance in the short term (Yoo et al., 2019; Yu and Kim, 2020) and that an explorative strategy requires extensive

technical HR knowledge transfer from HQ. This finding may also extend to non-Korean multidivisional and multinational firms.

The second implication is for those *Chaebols* that have elected to eschew the intense exchange of explorative HR knowledge. These firms benefit most by aggressively pursuing exploitative HR knowledge exchange among HQ units. Moreover, they can benefit by transferring only limited HQ schemas so that the subsidiaries can select, adapt, and adopt schemas that rapidly fit their local environments and deliver good short-term performance with minimal distraction. They, too, need to be concerned about long-term vulnerability to explorative HR knowledge exchange.

The third managerial implication is for those successful *Chaebols* that have elected to shift to combine highly exploitative HR knowledge exchange with highly explorative HR knowledge exchange (mostly sought by large and mature *Chaebols*). Their first challenge is to ensure that attention to highly exploitative HR knowledge exchange is maintained despite the distraction. The second is to maintain a sufficiently high level of HQ HR knowledge transfer.

Last but not least, the dilemma of low subsidiary performance payoff for exploration remains. If they are to survive in the long run, managers have to wrestle with abandoning the comforting world of rapid payoff from exploitative HR knowledge exchange with minimal HQ transfer. Furthermore, they must enter the painful world of explorative HR knowledge exchange with its attendant delays in subsidiary performance payoff as well as the cost of delivering high effort in HQ transfer.

5.3. Limitations and Future Research

The above results suggest at least three directions for future research along with certain limitations. First, given that organizational learning at the *Chaebol* level takes place over time, we should further test our research model using a longitudinal design. With a longitudinal study, we should be able to unfold the evolution of learning from HR knowledge exchange among HQ units of the *Chaebols* and better assess the impact of this learning on the HQ transfer of HR knowledge by overcoming the limitation of a cross-sectional study.

Second, although we understand the value of conducting quantitative research, we also find the merits in conducting multiple case studies, through massive in-depth interviews with TMT members in leading *Chaebols*, to begin to reveal the actual organizational learning mechanisms and their impact on the subsidiary's performance.

Third, we collected the data for our main variables through a survey. However, knowledge exchange and transfer can be measured by patent data or other archival data. In addition, given the effect of innovation knowledge diffusion, this study may need to differentiate the short- and long-term performances (e.g., ROA and ROI) of subsidiaries. Nevertheless, the issue of data availability emerged for the variables of some portions of our sample *Chaebol* GACs. Furthermore, if scholars can use patent data or other archival data in future research to analyze our research model, the results can have different implications. We were not able to use these alternative measurements for our variables. Thus, we encourage such measurements for our constructs in future research.

Finally, given that we used *Chaebol* GACs as our sample, generalization may occur in the transfer of knowledge due to the unique characteristics and differentiations of the *Chaebol*. Nevertheless, the *Chaebol* has been categorized as one of the prevalent business groups across the globe (Chang and Hong, 2000; Lee et al., 2010; Lee et al., 2020). Hence, we believe that our findings can be applied to the broad category of business groups that have existed in both developed and developing countries.

6. Conclusion

This study makes it clear that the performance of *Chaebol* subsidiaries depends substantially on the management of sustainable HR innovation knowledge, as reflected in the choices about the exchanges of both exploitative and explorative sustainable HR innovation knowledge among HQ firms and the subsequent transfer of technical HR knowledge from HQ to the subsidiaries. The *Chaebols'* choices about these three HR knowledge management variables have very high correlations with subsidiary performance. Relying on whether the *Chaebol* opts to seek the exchange of explorative sustainable HR innovation knowledge among units excessively, three major strategic choices appear to yield good performance results as follows.

First, a low exploration strategy practices extensive exploitative exchange, but the extensive transfer from HQ is *deleterious*. This scenario yields short-term benefits. Second, a high exploration strategy pursues extensive explorative exchange, and extensive HQ transfer is *highly beneficial*. This scenario does not deliver short-term benefits. Third, an ambidextrous strategy pursues both explorative and exploitative exchanges. The benefits of increased HQ technical transfers are *modest* but real, and short-term performance is good but modest.

The contribution of the study at its core is the evidence that the subsidiary performance relies not only on the choice of the degrees of exploitative and explorative technology exchanges at the HQ level. It also depends on the correct *combination* of the degrees of both types of exchanges with the extent to which HQ undertakes technical schema transfer to the subsidiary.

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