

A COMPARATIVE STUDY ON KNOWLEDGE TRANSFER BETWEEN TURKISH AND CHINESE IN MANUFACTURING INDUSTRY

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Abstract

In this paper, the concept of 'knowledge transfer' is restricted to the marketing, technological, and managerial knowledge between companies. The overall interaction between developing countries is investigated in terms of the knowledge transfer. We extract the factors of interaction between the companies in terms of the knowledge transfer. When the factors are determined, corresponding most representative question sets are constructed to reveal the existence of determined factors in selected case studies. For each company, at least two different respondents from different departments (R&D, product development, production, supplier support & development) are selected to ensure the reliability of research. The results of the survey are analyzed in terms of distribution, factor and regression analyses. Factor analysis is used to test the construct validity of the data and to identify underlying constructs in the data, as well as to reduce the number of variables with an attempt to retain as much of the information as possible and make the remaining variables meaningful. In the stage of hypothesis testing, regression techniques are mainly employed in order to examine the relationship between independent variables and knowledge transfer separately. Through the proposed research, formalization of the effect of various parameters on success of two sided knowledge transfer for developing country case is achieved.

Keywords: Knowledge Transfer, Manufacturing Industry

JEL code: O33, P40

1. Introduction

Developing countries have low skill sets compared to developed countries. In order to enhance their productivity and competitive characteristics, developing countries should transfer knowledge from other countries. In addition to that, the amount of research investments are also limited in developing countries. However, the amount of investments in research and development projects strongly determine technology creation and innovation characteristics of the countries and organizations. Developed economies, spend much more

than developing countries on research and development. This huge gap between developed and developing countries in terms of technological innovations, results in inevitable necessity of knowledge transfer and collaborative knowledge creation for developing countries.

Knowledge transfer between developing countries has its special characteristics. Companies from developed countries have strict knowledge sharing policies. Foreign direct investments (FDIs) conducted by firms from developed countries strictly separate research and development from manufacturing and thus they offer limited knowledge transfer developing countries. However, FDIs conducted by firms from developing countries enhance collaboration and knowledge transfer capabilities. Human resource based knowledge transfer is another important way of knowledge transfer. However, human resource transfer is usually from developing countries to developed countries. Thus, human resource transfer between developed and developing countries enable knowledge transfer from developing countries to developed countries. On the other hand, human resource transfer between developing countries are more balanced and both sides are able to transfer knowledge through human resource transfer.

The focus of the proposed work is determining the factors of knowledge transfer between developing countries. We would consider the special characteristics of knowledge transfer between developing countries and determine factors accordingly. When the influencing factors are determined and the effect of each factor on success of knowledge transfer is identified, corresponding improvement strategies could be developed and employed.

2. Research Background

The literature concentrates on knowledge transfer between developing and developed countries through foreign direct investments. Up to our knowledge, there is not a detailed research on knowledge transfer between developing countries. However, knowledge transfer between developing countries differs from knowledge transfer between developing and developed countries. Knowledge transfer between developing countries is two sided, in other words, equal position transfer means learning through transfer from both sides. That means both participating countries can transfer some level of marketing, technological, and managerial knowledge from other. However, the knowledge transfer is one way between developing and developed countries. Developed countries can transfer only experience for joint working concerns from developed countries. On the other hand, a developing country may transfer marketing, technological, and managerial knowledge from developed country. Foreign direct investment strategies of the firms in developed countries are also stricter compared to those in the developing countries. Thus, foreign direct investment from a developing country may enhance knowledge transfer to another developed country. Human resource based knowledge transfer is also two sided between developed countries on the contrary to developed country case. In this study, the factors affecting the level of knowledge transfer between developing countries are investigated. The overall interaction among developing countries is investigated in terms of knowledge transfer.

Manufacturing industry deals with the production, fabrication and processing of products. Labor, automation processes, chemicals, equipment and various other factors are employed in production. In order to become successful in the manufacturing industry, competitive knowledge creation, innovation and knowledge transfer strategies should be constructed. Knowledge, information, communication, technology, innovation, research and development, research and educational institutes and human capital are the main focusses of the knowledge economies. (Lyotard, 1984). Employing innovation improves substantiality, adaptation to new markets, competitiveness and technology integration abilities of the organizations (Subramaniam and Youndt, 2005). Evolutionary theory of innovation states that effective knowledge creation and usage is the key for innovation and technological enhancements. (Zawislak and Marins, 2007).

Knowledge transfer would be defined as the exchange or diffusion of the knowledge. Diffusion could be between various types of knowledge sources and knowledge receivers: person-to-person, company to company, country to country. Knowledge transfer requires two actions: transmission and absorption (Davenport & Prusak, 1998). Both sides should be capable of handling knowledge transfer interactions.

The success of knowledge transfer heavily depends on the characteristics of the knowledge itself. The most common knowledge classification, in the literature was made by Nanoka and Takeuchi in 1995. The methodology of knowledge transfer is as important as the knowledge itself for achieving a useful and applicable knowledge transfer. The occurring environment is another important aspect of knowledge transfer. It has strong effects on the format, success and dimensions of the knowledge transfer. Within an organization, knowledge transfer could be defined as the process of learning of a group or a department from another experienced part of organization (Argote and Ingram, 2000).

According to literature, the absorptive capacity and the knowledge acquiring motivation of the knowledge receiver are crucial abstract factors of knowledge transfer affectivity (Szulanski, 1996, Lane and Lubatkin, 1998, Gupta and Govindarajan, 2000). Bonache and Oberty (2008) also examine the success factors for knowledge transfer. Knowledge characteristics, abilities and motivation of international and local employees, and the interaction and communication channels between the employees are examined in their paper. They propose a conceptual framework to assess effect of characteristics of senior managers, general managers, marketing or accounting executives on knowledge transfer. They conclude that some management initiatives could trigger the human-related factors. They state different types of senior managers and other executives should be involved in different type of knowledge transfer requirements.

Developing R&D projects are always more expensive and riskier than knowledge transfer and collaboration. In order to fulfil innovation demand of the market, knowledge transfer, knowledge collaboration and multidisciplinary knowledge accumulation abilities should be developed (Malerba, 1992).

A FDI is an investment of a multinational corporation in another country. The main non-domestic investor company founds a corresponding local organization or subsidiary in the host country. Multinational corporations (MNCs) are able to transfer production-based, investment-based, market-based and organization-based knowledge to its local subsidiaries. On the other hand, degree of the knowledge transfer and knowledge spillover effects strongly depend on the characteristics of the MNC, host economy and the industry of concern. In order to strengthen the knowledge transfer opportunities and economic growth, governments proposed various means of stimulus for the FDIs (Blomstrom and Kokko, 2003).

MNCs have strong world-wide and organizational connections, and they are able to create and transfer knowledge to other units of the corporation. They have established and well defined financial and managerial processes for internal and external knowledge transfer (Bartlett and Ghoshal 1988). Effectiveness of internal knowledge transfer within an organization depends on two types of factors; knowledge-related and motivational. Ambiguous, tacit, complex, and specific knowledge is hard to model, document and transfer. High cultural and organizational distances are other factors, which make knowledge transfer difficult to achieve. Existence of effective transmission and communication channels, and high knowledge absorbing and acquiring capacity are important motivational knowledge transfer utilizers (Szulanski, 1996). In order to overcome the resistance, employees should be motivated for acquiring and transferring knowledge (Lane and Lubatkin, 1998). Spillover is defined as the knowledge transfer between MNCs and local organizations. The interactions that result in spillover are imitation, acquisition of human capital, competition, cooperation and exports (Görg and Greenaway, 2004).

Absorptive and productive capacities of local organizations, characteristics of MNCs and characteristics of foreign affiliates of MNCs, are stated as the main determinants of occurrences of FDI spillovers to the host country. There are various researches on those determinants. Market positioning, autonomy levels, innovative capabilities, characteristics of subsidiaries, knowledge-creation activities, knowledge-sharing strategies and entry aim to host economies could be stated as the main determinants of the level of spillover impact to the host economies (Altenburg 2000, Blomstrom and Kokko 2003). Subsidiaries of the MNCs have different characteristics from headquarter. Thus, characteristics, capabilities and external network connections of the subsidiaries also determine the degree of spillover impacts on the host economies (Bell and Marin 2006).

FDIs fulfil the knowledge, research and financial requirements of developing countries and construct knowledge creation, transfer and utilization networks (Blomstrom and Kokko, 2003). MNCs construct local connections for production and marketing concerns. Through these connections, human resource transfers and existence-based competition effects, they enable knowledge diffusion to the local actors in the market. Governments have realized those impacts of MNCs and they reduced existing domestic market protections. Together with decreasing market protections, the market attracts more FDIs and thus new product categories and competition areas may emerge in the host market (Teece, 1997).

Human resource transfers from MNCs to local organizations also form another channel of knowledge transfer. Employees of MNCs transform both technological and market-based knowledge, which increase productivity and innovation abilities of the local organizations. Being a supplier of a MNC also results in production and knowledge level enhancement of the local organization through the employed quality assurance policies, production requirements, and interaction policies. The knowledge transfer through direct and indirect interactions between MNCs and local organizations is called spillover. Direct business interactions between MNC and local suppliers are achieved through technical and marketing trainings performed by MNC for the local suppliers. The product quality, production cost, production reliability and production speed policies of the MNC could be other driving forces for local suppliers to enhance their abilities. Indirect interactions are resulted from imitations of the products and processes of the MNC that are conducted by local organizations. Competition pressure is another driving force for indirect interaction between the MNC and local organizations (Görg and Greenaway, 2004).

International Monetary Fund and the World Bank recommended enabling operation of FDIs especially in developing countries in order to achieve spillover impact to local markets. Many developing countries decreased the level of restrictions on foreign capital flow, the ownership, the control over the markets and corresponding tax rates to attract more FDIs (Narula and Portelli, 2004). However, assumption of positive impact achieved by existence of FDIs cannot be made if prior economic enhancements are not satisfied in the local market. FDIs may have spillover impact only under certain conditions, which depend on local economic structure, absorptive and productive capacities of local organizations, eagerness of knowledge sharing, characteristics of the FDIs and the properties of production. There are even negative impact examples caused by FDIs (Blomstrom and Kokko, 2003).

There are various positive stories of spillover impacts of FDIs. AB Volvo's truck and bus factory investments in Brazil, China, Mexico and India was one of those positive examples. Volvo has a collaboration promoted strategy in its investments. Thus, interactions of Volvo with local suppliers lead to intense technology and knowledge transfer. High quality requirements of Volvo also lead to high level of technical interactions between Volvo and local suppliers. Another collaboration factor in Volvo case was the adaptability characteristics of the automotive industry (Ivarsson and Alvstam, 2005). However, there are also negative stories of spillover impacts of FDIs. Foreign investments on the productivity of domestically owned plants caused dramatic negative impacts on the large Venezuelan companies. FDIs achieved plant productivity enhancements only for small enterprises. However, large companies lost their market shares, because they were not prepared to compete with an international player (Görg and Greenaway, 2004).

Direct trade of knowledge is the other way of knowledge transfer. In this model, knowledge is transferred directly by preserving knowledge licensing in the producer organization. In the preservation of the license, patent usage agreements are signed between the knowledge source and other organizations. However, the intellectual property rights should be well established

and employed in the occurring country of license exchange. There are various researches on examination of the correlation between the import and productivity of the importing countries. Results indicate high positive correlation between research and development involvement of the imported capital goods and total factor productivity of importer (Coe, *et al.*, 1997).

Existence of the skilled labor is crucial for productivity, knowledge transfer, innovation and competition characteristics of the organizations. Developing skilled human resource and corresponding strong labor market are important challenges for developing countries. Constructing a technology oriented education system, promoting labor mobility and constructing industry-oriented training can be listed as the main ways of developing skilled and required human resource. When labor turnover is enabled, knowledge and technology transfer between the source and receiver is promoted. Görg and Strobl (2002) conducted an experimental research on the collaboration between labor mobility and productivity of the receiver organization. They examined data collected from organizations specialized in manufacturing plants in Ghana. They concluded that transferring skilled workers from MNCs strongly improve productivity of the reliever company. They also stated that, the industry of the both organization should be the same, otherwise there would not be any positive affect.

Knowledge transfer is the diffusion of the knowledge and expertise between units, departments, subsidiaries and teams of the organization. In addition to that, there is also external knowledge transfer, which can be defined as the diffusion of expertise, knowledge, skills between universities, organizations and research institutes. Knowledge transfer processes and strategies of the organization should ensure that the organization has the required intellectual knowledge. Knowledge transfer utilizes the creation, documentation and diffusion of the knowledge. Knowledge transfer has various dimensions such as employees, organizational processes and organization structure. Face-to-face communication, trainings, meetings, conferences and written media can be listed as some of the means of knowledge transfer. Human resource management strategy defines the structure and interactions between the employees and strongly determines the knowledge transfer abilities of the organizations. Human resource management also defines the employee selection, training, assessment, and rewarding rules and processes (Argote and Ingram, 2000).

As a result of knowledge economy, knowledge workers have become the main asset for the companies. Demand for workers, who are able to use and employ information and communication technologies effectively, has become the center of the human resource management (Ishak, Eze, and Ling, 2010). According to the recent researches, in order to construct an operational knowledge transfer strategy, corresponding human resource management strategy should be constructed accordingly. There exists a strong relationship between knowledge transfer capabilities, human resource management strategies and performance of the organization (Davoudi and Kaur, 2012). Successful integration of effective human resource management and knowledge transfer strategies result in innovative, skilled and deep learner workers. The more capable the organization on knowledge transfer, the more competitive and innovative it is.

Organizational learning and internal knowledge transfer capabilities strongly depend on adoption and utilization successful human resource management policies. Minbaeva *et al.* (2003) concluded that conducting trainings, performance reviews, performance-based compensation and enabling interactions improve knowledge transfer capabilities of MNCs. Knowledge creation, utilization and transfer has drawn considerable interest especially in human resource management literature (Wright *et al.*, 2001). However, there are various open research subjects in the field. Analyzing, determining and modelling the value of particular knowledge for an organization is an important research requirement in the literature.

Gupta and Govindarajan (2000) states that capital, product, and knowledge are the main items that are transferrable between the MNCs and the host markets. Tsang (1999) conducted an empirical research on Singaporean multinational companies operating in China to evaluate factors of knowledge flow. In the research, organizational knowledge transfer and learning features of multinational human resource management strategies were investigated. Empirical evaluation was conducted on 12 MNCs, in order to reveal knowledge and learning aspects. Total of 67 interviews were conducted with 23 managers in headquarters, with 17 expatriate managers in Singapore and with 27 Chinese managers. The role of expatriates in duplicating organizational routines in a foreign subsidiary is examined. The results indicated that effective expatriation improved knowledge transfer within MNCs. Selection of expatriates, trainings, rotations; expats' learning experience and efficiency of communication were the success factors of expatriation for utilizing knowledge transfer. Downes and Thomas (2000) also remind positive impact of expatriation on knowledge transfer. Sparkes and Miyake (2000) point to the positive impact of trainings to enhance knowledge transfer efficiency.

Minbaeva (2003) examines the correlation between human resource practices and inner knowledge transfer. The correlation is indirect. Motivation of knowledge receivers is considered the mediating variable to examine correlation between human resource strategies and knowledge transfer. Human resource practices strongly affect motivation of knowledge receivers, and motivation level is deterministic for effectively of knowledge transfer. Empirical studies are conducted on the data obtained from 92 subsidiaries of Danish multinational corporations located in 11 countries. Sparkes and Miyake (2000) conducted a case study on the subsidiaries of Japanese manufacturing firms in Brazil and Mexico. They examined the employed human resource development practices and knowledge transfer capabilities between Japanese manufacturing firms. They concluded that human resource development strongly affects knowledge transfer efficiency and capability. Both field and non-field trainings had high influence on enhancing knowledge transfer.

3. Research Design

3.1. Sample and Data Collection

This study was conducted in 11 manufacturing companies in April 2017. Number of employees of the companies were between 47 and 3000. We tried to conduct the survey on at

least two different respondents from different departments (R&D, product development, production, supplier support & development) to ensure reliability of research. We also conducted the survey to the managers and engineers who have longer working experiences in the company. In design of the survey, recommendations of sectorial representative institutions were taken for choosing case study firms. 302 questionnaires were collected from respondents currently working in the companies. The response rate was so low that we made high effort in order to reach previously mentioned number of respondents. A unit of analysis in this thesis is the employees of the selected manufacturing companies.

In this research, knowledge transfer is restricted to the marketing, technological, and managerial knowledge between companies. Thus, the focus of the proposed research is intra-organizational knowledge transfer. In order to analyze details of knowledge transfer the following types of improved knowledge and skills are queried in the prepared survey;

- Skill-based Marketing Techniques
- Market Requirement Perception
- Market Structure
- Production Improvements
- Manufacturing Techniques
- Technological Knowledge Other than Manufacturing Techniques

3.2. Research Objectives

Human resource based knowledge generation and innovation are the major drivers of economic growth. Transfer of knowledge from FDI is one of the most important channels for developing countries to upgrade their national technological capabilities, and essential in order to benefit from the FDI inflow in long term. The research will investigate the two-way coaction relation of intra-organizational knowledge transfer between companies of two developing countries. In this study, human resource based knowledge transfer between developing countries is investigated. Up to our knowledge, the subject has never been investigated before. Therefore, there is a lack of related research. Secondly, human resources based knowledge transfer related studies in the existing literature is too limited therefore collecting materials for the proposed study needed more effort to complete.

3.3. Factors

Initially, six different main factors were defined. These were

- Characteristics of the Employees: Absorptive Capacity and Employee Relationships
- Characteristics of Knowledge,
- Characteristics of the Organization: Organizational Culture, Leadership and Level of Knowledge Acquisition
- Technology usage for knowledge transfer,
- Competition Characteristics of the Company and Employee Transfer
- Network Characteristics.

Absorptive Capacity and Employee Relationships sub factors were examined in order to analyze Characteristics of the Employees. Organizational Culture, Leadership and Level of Knowledge Acquisition sub factors were investigated in order to analyze Characteristics of the Organization. Employee Transfer sub factor was studied in order to analyze Competition Characteristics of the Company. After the performed factor analyses, Network Characteristics factor was eliminated. The final factor set was as follows:

- Factor 1: Leadership, Competition Characteristics of the Company and Network Characteristics: Three factors that are Leadership, Competition Characteristics of the Company and Network Characteristics were combined into a single factor.
- Factor 2: Employee Relationships: Employee Relationships factor was planned to be inquired through questions Q18 (I could easily communicate with my colleagues), Q19 (My colleagues usually help me a lot) and Q20 (My colleagues usually trust me during the manufacturing process). However, Q18 was eliminated from the survey because of the factor analysis examinations. As a result of the factor analyses, Q14 and Q16 were also taken into account as representative questions for Employee Relationships factor.
- Factor 3: Organizational culture: Organizational culture factor was designed to be inquired through questions Q21, Q22, Q23, Q24, Q25 and Q26. However, Q22 (Autonomy is empowered) and Q23 (Coordination between employees is well established) were eliminated by examining factor analysis results. Q22 was designed to measure the ability to work independently however it should have been clearer. Q23 was designed to examine how well the interactions between employees were defined. However, the word ‘coordination’ did not indicate this query clearly. As a result of these analyses, questions Q22 and Q23 were eliminated from the organizational culture factor examination. Q34 (Employee transfer is common between our company and other market players) and Q35 (There are strategic alliance companies that my company is engaged) were designed to investigate network characteristics of the company. However, network characteristics was not identified to be a major factor for knowledge transfer between developing countries as a result of factor analysis application. Q34 was found to be reflecting organizational culture and examined as one of the corresponding questions.
- Factor 4: Working Country and Working Company: Q5 (Working Country) and Q6 (Working Company) were found to be a separate factor from factor analysis results.
- Factor 5: Work Experience and Number of Employees: Q3 (Work Experience) and Q10 (Number of Employees) were found to be a separate factor from the factor analysis results.
- Factor 6: Absorptive Capacity: Absorptive capacity factor was designed to be investigated through questions Q14 (I usually update my skills and knowledge through trainings in my current company), Q15 (I am able to apply new knowledge into work related problems in my current company), Q16 (I am aware of the details of my work environment in my current company) and Q17 (I know at least one foreign language). However, according to the results of the factor analysis, Q14, Q15 and Q16 were excluded from the representative questions of absorptive capacity.
- Factor 7: Previous Job Experience: Q7 (Previous Job Experience) was found to be a separate factor from the factor analysis results given in Table 4-4.

- Factor 8: Technology usage for knowledge transfer: Technology usage for knowledge transfer factor was designed to be investigated through questions Q36 (I actively use communication technologies in my job) and Q37 (Knowledge, strategies, production models are well documented and accessible in my company). According to the factor analysis results given in the Table 4-4, Technology usage for knowledge transfer factor was found to be better reflected through Q36 and Q4 (Working Position). The working position strongly changes the technology usage characteristics of the employee. For this reason, Q4 was assigned to that Technology usage for knowledge transfer factor. On the other hand, Q37 was not perceived as reflecting technology usage by the employees.

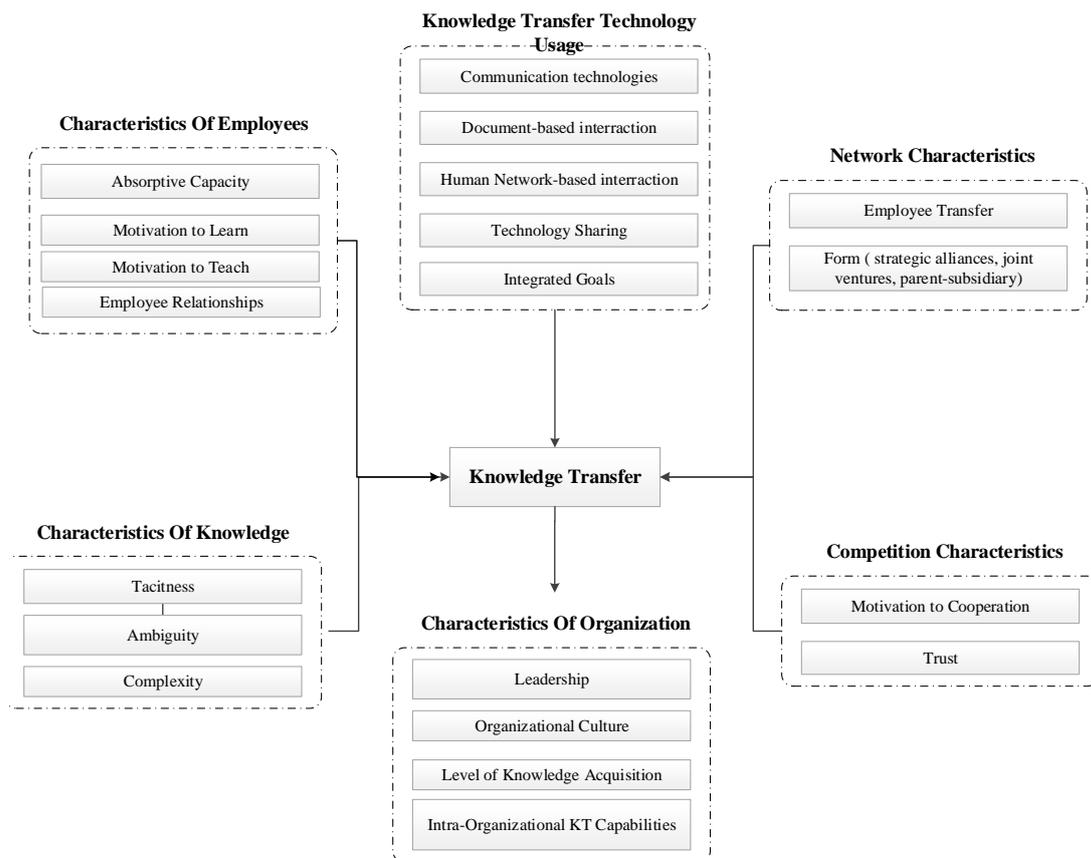


Figure 1: Knowledge transfer performance factors and production performance.

3.4. Hypothesis

In order to construct the hypothesis of this study, possible differences between China and Turkey that were introduced in the literature were targeted. Loyalty culture, turnover rates, organizational culture, competition culture and educational properties are commonly stated differences between China, Turkey and European countries.

Personal relationships with colleagues are more important than the loyalty to the company for Chinese employees. Thus, loyalty of Chinese employees to the company is usually low in comparison to the situation in Turkey (De Mooij and Hofstede, 2011). The average employee

turnover rate for privately owned companies was 18.5% in 2010 in China. On the other hand, turnover rate is much lower in Turkey, which is 12% (HR Reflections, 2011). As a result of these characteristics, MNCs are more motivated to employ foreigners in China compared to Turkey. The following hypothesis are derived from those differences:

- Human resource-based transfers are more deterministic in China compared to Turkey on intra-organizational knowledge transfer ability.
- Inter-organizational Knowledge transfer within the Chinese companies are more common compared to Turkish companies.
- Chinese employees have closer employee relationships compared to Turkish employees.
- Level of knowledge acquisition in Turkish companies is more deterministic on intra-organizational knowledge transfer ability compared to Chinese companies.
- Since Chinese employees are more loyal to managers than companies are. Leadership characteristics of managers are viewed as more deterministic on knowledge transfer abilities of the company in China compared to Turkey.

State-owned companies are more common in China compared to Turkey. State owned companies are generally expected to be more conservative in terms of knowledge sharing.

- There is a strong difference between China and Turkey in terms of organizational culture.
- Network characteristics are more deterministic in Turkey compared to China on intra-organizational knowledge transfer ability.
- Technology usage for knowledge transfer in China is more deterministic on knowledge transfer ability compared to Turkey.

Chinese education system is more standardized and less encouraging for innovation compared to education system in Turkey (HR Reflections, 2011); Absorptive capacity of the employees is more effective in Turkey compared to China on knowledge transfer ability. Chinese companies are known for ability to produce any product from blue print. In textile, manufacturing ability of China is known to be higher than Turkey. However, the fashion creation ability is better for Turkey case. Characteristics of knowledge are more deterministic for Turkish companies to be able to transfer corresponding knowledge. The competition is higher in Chinese market especially in costs. Competition characteristics of the Chinese companies are more deterministic on knowledge transfer capability.

Economic level of the country, where the company operates, is also a strong determinant for knowledge transfer occurrences (Gupta and Govindarajan, 2000). Knowledge transfer is two-way, from local market to the company and company to the local market. For global multinational companies, a MNC subsidiary in a less developed country is restricted for knowledge transfer. Positive effects of trust and shared vision are more effective in China compared to Finland on knowledge transfer ability (Li L., 2004).

Table 1: Defined Hypothesis.

Name	Variable	Variable	Hypothesis Description
H1	Employee Transfer	Knowledge Transfer	Human resource-based transfers are more deterministic in China compared to Turkey on Intra-organizational knowledge transfer ability.
H2	Characteristics of the Organization		There is a strong difference between China and Turkey in terms of organizational culture.
H3			H3a: Leadership abilities of managers are viewed as better in China compared to Turkey.
			H3b: Leadership characteristics of managers are more deterministic on knowledge transfer abilities of the company in China compared to Turkey.
H4			Level of knowledge acquisition in Turkish companies is more deterministic on knowledge transfer ability compared to Chinese companies. This hypothesis was eliminated as a result of elimination of Level of knowledge acquisition factor.
H5	Characteristics of the Employees		Absorptive capacity of the employees is more deterministic in Turkey compared to China on knowledge transfer ability.
H6			Knowledge transfer inside Chinese companies is more common compared to Turkish companies.
H7	Characteristics of Knowledge		Characteristics of knowledge are more deterministic for Turkish companies to be able to transfer knowledge.
H8	Technology usage for knowledge transfer		H8a: Technology usage for knowledge transfer is more common in companies in China compared to Turkey.
			H8b: Technology usage for knowledge transfer in China is more deterministic on knowledge transfer ability compared to Turkey.
H9	Competition Characteristics		H9a: Competition is higher in Chinese companies compared to Turkish.
		H9b: Competition characteristics of the Chinese companies are more deterministic on knowledge transfer ability.	
H10	Network Characteristics	Network characteristics are more deterministic in Turkey compared to China on knowledge transfer ability. This hypothesis was eliminated as a result of elimination of Network characteristics factor.	
H11	Employee Relationships	Chinese employees have closer employee relationships compared to Turkish employees.	

3.5. Questionnaire Design

In designing process of the questionnaire, first related factors were examined together with characteristic of manufacturing industry in developing countries and in reference to prior

researches and then the final version of the questionnaire was prepared. Each variable was measured by multiple items in order to increase the reliability of the measurements. Then, in-depth interviews with target respondents were carried out to check the meanings of the constructs, the relevance of measurements for each construct, as well as to verify whether potential respondents are able to complete the questionnaire. In this respect, 5-point Likert scale was employed for all questionnaire items. Multiple-item scales were developed for all constructs to ensure the reliability and validity of the measurement system.

Table 2: Multiple Comparisons for Home Region of Company and Organizational Culture.

(I) Q9	(J) Q9	Mean Difference (I-J)	Std. Error	Sig.
Chinese	Turkish	-,12157	,10568	,659
	Joint Venture Turkish - Chinese	,14622	,14787	,756
	MNC (Not Turkish – Chinese)	-,52656*	,17013	,012
Turkish	Chinese	,12157	,10568	,659
	Joint Venture Turkish - Chinese	,26779	,13673	,206
	MNC (Not Turkish – Chinese)	-,40499	,16054	,059
Joint Venture Turkish - Chinese	Chinese	-,14622	,14787	,756
	Turkish	-,26779	,13673	,206
	MNC (Not Turkish – Chinese)	-,67278*	,19097	,003
MNC (Not Turkish – Chinese)	Chinese	,52656*	,17013	,012
	Turkish	,40499	,16054	,059
	Joint Venture Turkish - Chinese	,67278*	,19097	,003

4. Hypothesis Testing

4.1. Verification of H1

This hypothesis is tested by conducting a one-way ANOVA analysis on independent variable Q4 and dependent variable intra-organizational knowledge transfer. When the multiple comparisons tables were examined, it was identified that, the mean difference value in Intra-organizational knowledge transfer ability in Turkish companies was little smaller between human resource-based transfer occurrence values compared to Chinese companies. However, the difference is so small and the significance of variation between human resource-based transfer occurrences was low for both Turkish and Chinese companies. As H1 was not verified, there is not a significant difference between Turkish and Chinese companies in terms of effect of Human resource-based transfers on Intra-organizational knowledge transfer ability.

4.2. Verification of H2

This hypothesis was tested by the conducting one-way ANOVA analysis on independent variable Home Region of Company and dependent variable Organizational Culture. The

multiple comparisons tables given in Table 2 were examined, H2 was not verified since there was not a significant difference between Turkish and Chinese companies in terms of Organizational Culture. However, there are significant differences between Multi-National Companies (Not Turkish – Chinese) and Joint Venture Turkish – Chinese companies.

4.3. Verification of H3

4.3.1. H3a

Means for groups of Leadership factor in homogeneous subsets are displayed in the Table 20. The questions Q27, Q28, and Q29 were designed to inquire the Leadership factor. The final value representing Leadership factor was calculated by averaging answers given to these three questions. The questions were designed to reflect how good abilities managers had in the corresponding company. Thus, “Strongly Agree” meant that the managers were viewed as best and “Strongly Disagree” meant that the managers were not viewed as good. H3a was invalidated by analyzing the percentages in the Table 3. On the contrary to the hypothesis Leadership abilities of managers were viewed as better in Turkey compared to China.

Table 31: Means for groups of Leadership factor in homogeneous subsets.

	Turkey		China	
	N	Percentage	N	Percentage
Strongly Disagree	2	1,04	10	9,00
Somewhat Disagree	3	1,57	11	9,90
Neutral	31	16,23	43	38,73
Somewhat Agree	113	59,16	3	2,70
Strongly Agree	42	21,98	44	39,63
Total	191	100	111	100

4.3.2. H3b

From conducted one-way ANOVA analysis on independent variable Leadership characteristics of Company and dependent variable Intra-organizational Knowledge Transfer, H3b was not verified since there was not a significant difference between Turkish and Chinese companies in terms of effect of Leadership perception on Intra-organizational knowledge transfer ability.

4.4. Verification of H5

Q17 was designed to reveal the Absorptive capacity of the employees in the corresponding company. Thus, “Strongly Agree” meant high Absorptive capacity while “Strongly Disagree” meant low Absorptive capacity. Means for groups of Technology usage for knowledge transfer factor in homogeneous subsets were displayed in the Table 4. It was noted that there

was not a significant difference between employees of Chinese and Turkish Companies.

Table 41: Means for groups of Absorptive capacity factor in homogeneous subsets.

	Turkey		China	
	N	Percentage	N	Percentage
Strongly Disagree	5	2,62	4	3,60
Somewhat Disagree	5	2,62	8	7,21
Neutral	24	12,57	21	18,92
Somewhat Agree	67	35,08	32	28,83
Strongly Agree	90	47,12	46	41,44
Total	191	100	111	100

Table 5: Means for Inter-organizational Knowledge Transfer for Home region of company.

Home Region of Company	Mean	N	Std. Deviation
Chinese	,5610	82	,49932
Turkish	,5066	152	,50161
Joint Venture Turkish - Chinese	,5000	40	,50637
Multi-National Company (Not Turkish – Chinese)	,6429	28	,48795
Total	,5331	302	,49973

Table 6: Means for Transferred Knowledge Types for Home region of company groups.

		Technological	Production	Marketing
Chinese	Mean (82 Item)	,2683	,7805	,5732
	Std. Deviation	,44580	,41646	,49766
Turkish	Mean (152 Items)	,3026	,6974	,5987
	Std. Deviation	,46092	,46092	,49179
Joint Venture Turkish – Chinese	Mean (40 Items)	,2750	,7250	,4750
	Std. Deviation	,45220	,45220	,50574
MNC (Not Turkish – Chinese)	Mean (28 Items)	,3571	,8214	,5000
	Std. Deviation	,48795	,39002	,50918
Total	Mean (302 Items)	,2947	,7351	,5662
	Std. Deviation	,45667	,44201	,49642

4.5. Verification of H6

Inter-organizational Knowledge transfer inside companies were inquired by the question Q11 (Ways of updating your work related skills and knowledge). The means for Inter-organizational knowledge transfer for home region of company groups are given in the Table 5, It can be followed in the Table that, the Inter-organizational Knowledge transfer inside Chinese companies were more common compared to Turkish companies. Thus, the

hypothesis H6 was verified.

4.6. Verification of H7

Characteristics of transferred knowledge were inquired by the question Q12 (What are the types of improved knowledge and skills). The three main knowledge types were extracted from the answers: Technological, Production and Marketing knowledge. The means for transferred knowledge types for home region of company groups are given in the Table 6. As it is seen, the proposed hypothesis was disproved. On the contrary, Characteristics of knowledge were less deterministic for Turkish companies to be able to transfer knowledge.

Table 7: Means for groups of Technology usage for knowledge transfer factor in homogeneous subsets.

	Turkey		China	
	N	Percentage	N	Percentage
Strongly Disagree	3	1,57	2	1,80
Somewhat Disagree	5	2,62	9	8,11
Neutral	32	16,75	35	31,53
Somewhat Agree	59	30,89	52	46,85
Strongly Agree	92	48,17	13	11,71
Total	191	100,00	111	100,00

4.7. Verification of H8

4.7.1. H8a

Technology usage for knowledge transfer factor was found to be better revealed out through Q36 (I actively use communication technologies in my job) and Q4 (Working Position). Thus, “Strongly Agree” meant high technology usage while “Strongly Disagree” referred to the low technology usage. Means for groups of Technology usage for knowledge transfer factor in homogeneous subsets are displayed in the Table 7. On the contrary, to the hypothesis, Technology usage for knowledge transfer in China was found to be less common in companies compared to Turkey. H8a was disproved

4.7.2. H8b

This hypothesis was tested by the conducting one-way ANOVA analysis on independent variable Technology usage for knowledge transfer of Company and dependent variable Intra-organizational Knowledge Transfer. When the multiple comparisons tables were examined, H8b could not be verified since there was not a significant difference between Turkish and Chinese companies in terms of effect of Technology usage for knowledge transfer on Intra-organizational knowledge transfer ability. It was noted that there was not a significant correlation between Technology usage for knowledge transfer factor and Intra-organizational

knowledge transfer ability either in China or in Turkey.

4.8. Verification of H9

4.8.1. H9a

The questions Q32 and Q33 were designed to inquire the Competition Characteristics of the Company factor. These questions were designed to reveal out the level of the competition in the corresponding company. Thus, “Strongly Agree” meant high competition while “Strongly Disagree” meant low competition. H9a was disproved by analyzing the percentages in the Table 8. On the contrary, to the hypothesis, competition in China was identified lower compared to Turkey.

Table 8: Means for groups in homogeneous subsets.

	Turkey		China	
	N	Percentage	N	Percentage
Strongly Disagree	3	1,57	2	1,80
Somewhat Disagree	5	2,62	11	9,91
Neutral	36	18,85	38	34,23
Somewhat Agree	90	47,12	47	42,34
Strongly Agree	57	29,84	13	11,71
Total	191	100,00	111	100,00

Table 9: Multiple Comparisons for Home Region of Company and Employee relationships.

(I) Q9	(J) Q9	Mean Difference	Std. Error	Sig.
Chinese	Turkish	-,02102	,10400	,997
	Joint Venture Turkish - Chinese	-,00457	,14638	1,000
	MNC(Not Turkish – Chinese)	-,45993*	,16613	,030
Turkish	Chinese	,02102	,10400	,997
	Joint Venture Turkish - Chinese	,01645	,13488	,999
	MNC(Not Turkish – Chinese)	-,43891*	,15609	,027
Joint Venture Turkish – Chinese	Chinese	,00457	,14638	1,000
	Turkish	-,01645	,13488	,999
	MNC(Not Turkish – Chinese)	-,45536	,18702	,073
MNC (Not Turkish – Chinese)	Chinese	,45993*	,16613	,030
	Turkish	,43891*	,15609	,027
	Joint Venture Turkish - Chinese	,45536	,18702	,073

4.8.2. H9b

This hypothesis was tested by conducting a one-way ANOVA analysis on independent variable Competition characteristics of Company and dependent variable Intra-organizational Knowledge Transfer. When the multiple comparisons tables were examined, H9b could not be

verified since there was not a significant difference between Turkish and Chinese companies in terms of effect of Competition characteristics on Intra-organizational knowledge transfer ability. There was not a significant correlation between Competition characteristics factor and Intra-organizational knowledge transfer ability neither in China nor in Turkey.

4.9. Verification of H11

This hypothesis was tested by conducting a one-way ANOVA analysis on independent variable Home Region of Company and dependent variable Employee relationships. The multiple comparisons tables given in the Table 9 were investigated, H11 could not verified since there was not a significant difference between Turkish and Chinese companies in terms of Employee relationships.

5. Discussion and Conclusions

The main objective of the thesis was based on following arguments;

- Examine two-sided knowledge transfer characteristics
- Human resource based knowledge transfer and resulting knowledge and technology generation and innovation are important drivers of economic growth. In this study, an empirical analysis was conducted to determine correlation between the labor flows and knowledge transfer.
- Knowledge transfer from foreign direct investments (FDIs) is one of the most important channels for developing countries to upgrade their national technological capabilities and to improve innovation abilities. Knowledge transfer is also essential to benefit from the FDI inflow in long term.
- In this study, the interaction among developing countries is investigated in terms of knowledge transfer. As far as is known, there is not any research on analysis of knowledge transfer based two-way interaction between developing countries.

The hypothesis proposed in the thesis were tested by conducting a one-way ANOVA analysis, means analysis and correlation analysis. As a result of the hypothesis tests, the following conclusions were derived:

- There is not a significant difference between Turkish and Chinese companies in terms of effect of Human resource-based transfers on knowledge transfer ability.
- There is not a significant difference between Turkish and Chinese companies in terms of Organizational Culture.
- Leadership abilities of managers are viewed as better in Turkey compared to China.
- There is not a significant correlation between Leadership factor and knowledge transfer ability neither in China nor in Turkey.
- There is not a significant correlation between Absorptive Capacity factor and knowledge transfer ability neither in China nor in Turkey.
- Knowledge transfer inside Chinese companies are more common compared to Turkish companies. Thus, the hypothesis H6 is verified.

- Characteristics of knowledge are less deterministic for Turkish companies to be able to transfer knowledge.
- Technology usage for knowledge transfer in China is found to be less common in companies compared to Turkey.
- There is not a significant correlation between Technology usage for knowledge transfer factor and knowledge transfer ability neither in China nor in Turkey.
- Competition in China is found to be less compared to Turkey.
- There is not a significant correlation between Competition characteristics factor and knowledge transfer ability neither in China nor in Turkey.

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