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## **Entrepreneurship in multinational corporations and capability development of domestic firms: An exploratory study in the US-Mexico border region**

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ENTREPRENEURSHIP IN MULTINATIONAL CORPORATIONS AND CAPABILITY  
DEVELOPMENT OF DOMESTIC FIRMS: AN EXPLORATORY STUDY  
IN THE US-MEXICO BORDER REGION

A Dissertation

by

JUNG-HOON LIM

Submitted to the Graduate School of the  
University of Texas-Pan American  
In partial fulfillment of the requirements for the degree of

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December 2010

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DEVELOPMENT OF DOMESTIC FIRMS: AN EXPLORATORY STUDY  
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December 2010



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## ABSTRACT

Jung-Hoon, Lim, Entrepreneurship in Multinational Corporations and Capability Development of Domestic Firms : An Exploratory Study in the US-Mexico Border Region. Doctor of Philosophy (Ph.D), December, 2010, 257 pp., 7 tables, 8 figures, 59 exhibits, 254 titles, 2 appendices.

This dissertation explores the relationship between entrepreneurship and capability development in emerging markets. This study focuses on entrepreneurial activities in multinational corporations (MNCs) in emerging markets. Maquila plants and local Mexican suppliers located in (or near) Reynosa, Tamaulipas are investigated. The results from 34 interviews of a sample local Mexican supplier, maquila plant, local government, local university and Reynosa Asociación de Maquiladoras y Manufactureras, A.C. (RAMMAC) suggest that the entrepreneurship in the maquila plants occurs through the continuous improvement in the manufacturing process. The purpose is primarily efficiency and quality. The border economy that is primarily driven by the economic cycle in the United States, especially recession, tends to strengthen this trend. Recognition of new market opportunities and product development are not strong entrepreneurial activities in the maquila plants. There is currently no strong linkage between entrepreneurial activities in the maquila plants and capability development of local Mexican suppliers. However, if there are more entrepreneurial activities in the maquila plants, there will be more business opportunities for local Mexican suppliers. Local Mexican suppliers learn about the business processes from maquila plants. Entrepreneurial activities in the maquila



plants can potentially have a positive effect on the capability development of local Mexican suppliers. Maquila plants learn from and do business with various sizes and types of local Mexican suppliers. The learning content of maquila plants from local Mexican suppliers includes process improvement as well as the local culture. Thus, capability development of local Mexican suppliers can potentially have a positive effect on entrepreneurial activities in the maquila plants. The governance structure between maquila plants and local Mexican suppliers is the strongest for network structure than for the market and hierarchy structures. Hierarchical structure is not strong for maquila plants and local Mexican suppliers. The governance structure between maquila plants and local Mexican suppliers on capability development of local Mexican suppliers is the mixed result. The current commitment of maquila plants to local communities is strong for employee benefits. This characteristic of local embeddedness of maquila plants is not related to the capability development of local Mexican suppliers.

## ACKNOWLEDGEMENTS

*“Do whatever He tells you” (Jn 2:5)*. Having completed my dissertation and finalizing the Ph.d program, I thought about this sentence in the bible. I believe that my life is God’s plan. I will also continue to follow God’s plan.

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## TABLE OF CONTENTS

	Page
ABSTRACT.....	iii
ACKNOWLEDGEMENTS.....	v
TABLE OF CONTENTS.....	vi
LIST OF TABLES.....	xv
LIST OF FIGURES.....	xvi
LIST OF EXHIBITS.....	xvii
CHAPTER I. INTRODUCTION.....	1
Statement of the problem.....	2
Purpose of the Study.....	6
CHAPTER II. LITERATURE REVIEW.....	9
Entrepreneurship in Multinational Corporations.....	9
Definition and Importance of Multinational Corporations.....	9
Why Has Subsidiary Been Recognized as Being Important?.....	9
What Is Entrepreneurship in Multinational Corporations?.....	10
General definition of entrepreneurship.....	10
Definition of subsidiary.....	11
Subsidiary role vs Subsidiary strategy.....	11
Definition of entrepreneurship in multinational corporations.....	12
Learning Process of Domestic firms from Multinational Corporations.....	15

General Definition of Learning.....	15
Learning Behaviors of Domestic Firms from Foreign Entrants.....	16
Technological Spillover Process.....	19
Technological Assistance from Multinational Corporations to Local Suppliers.....	21
Knowledge Transfer Mechanism.....	22
Capability Development of Domestic firms.....	24
Definition of Capability.....	24
Definition of Supplier Capability.....	25
Supplier Development.....	28
Managerial, Technological and Financial Capabilities as Supplier Capabilities in the Emerging Markets.....	29
Governance Structure and Local Embeddedness as Moderating Contexts.....	35
Governance Structure in Supply Chain.....	35
Local Embeddedness.....	39
Maquiladora Industry - Entrepreneurship and Capability Building in Maquila Plants .....	40
Carrillo’s Study.....	41
Sargent and Matthews’s Study.....	42
Dutrenit and Vera-Cruz’s Study.....	43
Research Model and Research Propositions.....	44
Subsidiary’s Active Role for Knowledge Spillovers.....	44
Entrepreneurship and Learning in Supply Chain.....	45
Learning Local Markets and Institutional Relationships from Local Partners – Reverse knowledge spillover.....	46

Continuous Innovation through Collaboration in Supply Chain – Collaborative Entrepreneurship.....	48
Governance Structure and Local Embeddedness as Source of Social Divide.....	50
CHAPTER III. RESEARCH METHOD.....	53
Sample.....	53
Reynosa City.....	53.
Supplier Development Program in Reynosa.....	54
RAMMAC supplier development Program (supplier database program).....	55
Electric-electronics cluster program of Reynosa.....	56
Government support Program.....	57
Sample of Local Mexican Suppliers.....	58
Sample of Maquila Plant.....	62
Sample of Local Government, Local University and Coordinating Organization....	65
Method.....	67
Unexamined Areas: Research Voids.....	67
Qualitative and Exploratory Research.....	68
Data Collection.....	69
Semi-structured Interviews.....	69
Data collection process.....	69
Interview Questions and Interview Analysis.....	71
CHAPTER IV. RESULTS.....	78
Proposition Results.....	78
Capability of Local Mexican Supplier.....	78

Local Mexican supplier responses.....	78
Maquila plant responses.....	82
Local government, local university and RAMMAC responses.....	85
Proposition One.....	87
Maquila plant responses.....	88
Entrepreneurial activities in the maquila plant.....	88
The reason for entrepreneurial activities in the maquila plant.....	90
Any important factors (e.g. border environment) that affect entrepreneurial activities in the maquila plant.....	92
Effect of entrepreneurial activities in the maquila plant on the capability development of local Mexican supplies.....	93
Local Mexican supplier responses.....	94
Entrepreneurial activities in the maquila plant.....	94
The reason for entrepreneurial activities in the maquila plant.....	96
Any important factors (e.g. border environment) that affect entrepreneurial activities in the maquila plant.....	97
Effect of entrepreneurial activities in the maquila plant on the capability development of local Mexican suppliers.....	97
Learning from maquila plants.....	97
Proposition Two.....	102
Maquila plant responses.....	102
Proposition Three.....	107
The effect of transactional characteristics between maquila plants and local	

Mexican suppliers on the relationship among entrepreneurial activities in the maquila plants and capability development of local Mexican suppliers.....	107
Maquila plant responses.....	107
Local Mexican supplier responses.....	107
The transaction type between maquila plants and local Mexican suppliers.....	108
Maquila plant responses.....	109
Local Mexican supplier responses.....	111
The effect of transaction type on maquila plants and local Mexican suppliers... .....	113
Maquila plant responses.....	113
Local Mexican supplier responses.....	115
The effect of the commitment of maquila plants to local community on the relationship among entrepreneurial activities in the maquila plants and capability development of local Mexican suppliers.....	117
Maquila plant responses.....	117
Local Mexican supplier responses.....	117
Commitment of maquila plant to local community (or contribution to the development of local community).....	118
Maquila plant responses.....	118
Local Mexican supplier responses.....	122
Additional Results.....	124
The Motive of Transacting with Local Mexican Suppliers.....	124
Maquila plant responses.....	124



Local Mexican supplier responses.....	126
The Strength and Weakness of Local Mexican Suppliers.....	127
Maquila plant responses.....	127
Local Mexican supplier responses.....	129
Capability Development of Local Mexican Suppliers and Opportunity and Threat to Local Mexican Suppliers with the Upgrading of Maquiladora Industry.....	131
Maquila plant responses.....	132
Local Mexican supplier responses.....	133
Local government, local university and RAMMAC responses.....	140
The Absorptive Capacity of Local Mexican Suppliers.....	142
Maquila plant responses.....	142
Local Mexican supplier responses.....	143
Local government, local university and RAMMAC responses.....	145
Border Environment.....	146
Maquila plant responses.....	146
Local Mexican supplier responses.....	148
Local government, local university and RAMMAC responses.....	149
Recession.....	150
Maquila plant responses.....	150
Local Mexican supplier responses.....	151
Local government, local university and RAMMAC responses.....	153
Sourcing Strategy of Maquila Plant in the Recession.....	155
Maquila plant responses.....	155

Survival Strategy of local Mexican suppliers in the Recession.....	156
Maquila plant responses.....	156
Local Mexican supplier responses.....	156
Local university and RAMMAC responses.....	159
Difficulties in the Transaction between Maquila Plants and Local Mexican Suppliers.....	160
Maquila plant responses.....	160
Local Mexican supplier responses.....	161
Corruption.....	163
Maquila plant responses.....	163
Local Mexican supplier responses.....	164
RAMMAC responses.....	167
RAMMAC Supplier Development Program (Supplier Database) / Cluster Program.....	168
Maquila plant responses.....	168
Local Mexican supplier responses.....	170
Local government responses.....	172
Local university responses .....	174
RAMMAC responses.....	174
Overall Solution for Capability Development of Local Mexican Suppliers.....	177
Maquila plant responses.....	177
Local Mexican supplier responses.....	178
Local government responses.....	179

Local university responses.....	180
The Initiative Role for Capability Development of Local Mexican Suppliers.....	181
Maquila plant responses.....	181
Local Mexican supplier responses.....	181
Local government, local university and RAMMAC responses.....	181
CHAPTER V. FINDINGS, IMPLICATIONS AND LIMITATIONS.....	183
Study Findings.....	183
Proposition One.....	183
Proposition Two.....	184
Proposition Three.....	184
Proposition Three and Three Dash One.....	185
Theoretical Implications.....	185
Policy Implications.....	188
Strategy of Capability Development of Local Mexican Suppliers.....	188
Constraints in the Border for Capability Development of Local Mexican Suppliers.....	194
Recession.....	194
Corruption.....	195
Border Security.....	196
Government Role as a Buffer for the Constraints on the Border.....	197
Limitations and Future Research.....	198
REFERENCES.....	199
APPENDIX A: INFORMED CONSENT FORM (INTERVIEW) AND INTERVIEW QUESTIONS (ENGLISH VERSION).....	226

APPENDIX B: INFORMED CONSENT FORM (INTERVIEW) AND INTERVIEW  
QUESTIONS (SPANISH VERSION).....241

BIOGRAPHICAL SKETCH.....257



## LIST OF TABLES

	Page
Table 1: Key determinants of global value chain governance.....	38
Table 2: Characteristics of sample local Mexican suppliers 1.....	61
Table 3: Characteristics of sample local Mexican suppliers 2.....	62
Table 4: Characteristics of sample maquila plants 1.....	64
Table 5: Characteristics of sample maquila plants 2.....	65
Table 6: Sample organizations and interviewees of local government, local university and coordinating organization.....	66
Table 7: Measures.....	73



## LIST OF FIGURES

	Page
Figure 1: Learning approaches – local emerging market firms.....	17
Figure 2: Knowledge transfer mechanism.....	22
Figure 3: Four dimensions of core capability.....	26
Figure 4: A conceptual framework to examine smaller suppliers’ interaction capability developments in relationships with larger customers.....	27
Figure 5: Supply chain governance structure.....	36
Figure 6: The cycle of organizational learning in an effective relationship.....	51
Figure 7: Research model.....	52
Figure 8: Classification of 110 suppliers in RAMMAC supplier database.....	59





## LIST OF EXHIBITS

	Page
Exhibit 1: Response to the question : What capabilities are necessary (or important) to the product or the service of your company? (Local Mexican supplier).....	79
Exhibit 2: Response to the question : How does your company obtain the necessary (or important) capabilities? (Local Mexican supplier).....	80
Exhibit 3: Response to the question : Is there any assistance or interaction for those capabilities from the maquila plant? (Local Mexican supplier).....	81
Exhibit 4: Response to the question : To what extent do you evaluate capabilities of local Mexican suppliers? (Maquila plant).....	82
Exhibit 5: Response to the question : Is there any assistance or interaction for capabilities of local Mexican suppliers from your plant? (Maquila plant).....	84
Exhibit 6: Response to the question: How do you evaluate the level of capabilities of local Mexican suppliers? (Local government, Local university and RAMMAC).....	86
Exhibit 7: Response to the question : Are there entrepreneurial activities in the plant? (Maquila plant).....	89
Exhibit 8: Response to the question : Why are there entrepreneurial activities in the plant? (Maquila plant).....	91
Exhibit 9: Response to the question: Do the entrepreneurial activities in the plant affect capabilities of local Mexican suppliers? (Maquila plant).....	93

Exhibit 10: Responses to the question: Are there entrepreneurial activities in the maquila plant? (Local Mexican supplier).....	95
Exhibit 11: Response to the question : Why are there entrepreneurial activities in the maquila plant? (Local Mexican supplier).....	96
Exhibit 12: Response to the question : Do the entrepreneurial activities in the maquila plant affect capabilities of your company? (Local Mexican supplier).....	98
Exhibit 13: Response to the question : To what extent does your company learn from the maquila plant? And what does your company learn from the maquila plant? (Local Mexican supplier).....	99
Exhibit 14: Response to the question : To what extent does your plant learn from local Mexican suppliers? And what does your plant learn from local Mexican suppliers? (Maquila plant).....	103
Exhibit 15: Maquila respondent's comments about the size and the type of local Mexican suppliers (Maquila plant).....	105
Exhibit 16: Response to the question : What is the transaction type between your plant and local Mexican suppliers? (Maquila plant).....	109
Exhibit 17: Response to the question : What is the transaction type between your plant and local Mexican suppliers? (Local Mexican supplier).....	112
Exhibit 18: Response to the question : Does this transactional characteristic affect the business of your plant? (Maquila plant).....	114
Exhibit 19: Response to the question : Does this transactional characteristic affect capabilities of local Mexican suppliers? (Maquila plant).....	115

Exhibit 20: Response to the question : Does this transactional characteristic affect capabilities of local Mexican suppliers? (Local Mexican supplier).....	116
Exhibit 21: Response to the question : To what extent does your plant commit to local community or contribute to the development of local community? (Maquila plant).....	119
Exhibit 22: Response to the question : Does the commitment of your plant to local community affect the business of your plant? (Maquila plant).....	120
Exhibit 23: Response to the question : Does the commitment of your plant to local community affect capabilities of local Mexican suppliers? (Maquila plant).....	121
Exhibit 24: Response to the question : To what extent does the maquila plant commit to local community or contribute to the development of local community? (Local Mexican supplier).....	122
Exhibit 25: Response to the question : Why does your plant transact with local Mexican suppliers? (Maquila plant).....	125
Exhibit 26: Response to the question : Why does the maquila plant transact with local Mexican suppliers? (Local Mexican supplier).....	126
Exhibit 27: Response to the question :What is strength and weakness of local Mexican suppliers? (Maquila plant).....	128
Exhibit 28: Response to the question : What is strength and weakness of local Mexican suppliers? (Local Mexican supplier).....	130
Exhibit 29: Response to the question : There has been a large amount of investment in the maquiladora industry. Do you think that capabilities of local Mexican suppliers have actually increased with the investment? (Maquila plant).....	132

Exhibit 30: Response to the question : There has been a large amount of investment in the maquiladora industry and what are opportunities and threats to local Mexican suppliers? (Maquila plant).....	134
Exhibit 31: Response to the question : There has been a large amount of investment in the maquiladora industry. Do you think that capabilities of local Mexican suppliers have actually increased with the investment? (Local Mexican supplier).....	136
Exhibit 32: Response to the question : There has been a large amount of investment in the maquiladora industry. What are opportunities and threats to local Mexican suppliers? (Local Mexican supplier).....	138
Exhibit 33: Response to the question : There has been a large amount of investment in the maquiladora industry. Do you think that capabilities of local Mexican suppliers have actually increased with the investment?(Local government and Local university)..	140
Exhibit 34: Response to the question : There has been a large amount of investment in the maquiladora industry. What are opportunities and threats to local Mexican Suppliers? (Local university and RAMMAC).....	141
Exhibit 35: Response to the question : How can local Mexican suppliers increase the absorptive capacity? (Maquila plant).....	143
Exhibit 36: Response to the question : How can your company increase the absorptive capacity? (Local Mexican suppliers).....	144
Exhibit 37: Response to the question : How can local Mexican suppliers increase their absorptive capacity? (Local government, local university and RAMMAC).....	146

Exhibit 38: Response to the question : Are there any other important factors (e.g. border environment) for capability development of local Mexican suppliers? (Maquila plant).....	147
Exhibit 39: Response to the question : Are there any other important factors (e.g. border environment) for capability development of local Mexican suppliers? (Local Mexican supplier).....	148
Exhibit 40: Response to the question : Are there any important factors (e.g. border environment) for capability development of local Mexican supplies? (Local government, Local university and RAMMAC).....	150
Exhibit 41: Response to the question : Recession is the current economic situation. Does this economic situation affect the answers to the above questions? If yes, what are the effects? (Maquila plant).....	151
Exhibit 42: Response to the question : Recession is the current economic situation. Does this economic situation affect the answers to the above questions? If yes, what are the effects? (Local Mexican supplier).....	152
Exhibit 43: Response - Recession is the current economic situation. Does this economic situation affect the answers to the above questions? If yes, what are the effects? (Local government, Local university and RAMMAC).....	154
Exhibit 44: Response to the question : Is there any special sourcing strategy of your plant in the recession? (Maquila plant).....	155
Exhibit 45: Response to the question : How can local Mexican suppliers survive in the recession? (Maquila plant).....	157

Exhibit 46: Response to the question : What is the survival strategy of your company in the recession? (Local Mexican supplier).....	158
Exhibit 47: Response to the question : How can local Mexican suppliers survive in the recession? (Local university and RAMMAC).....	160
Exhibit 48: Response to the question : What are the difficulties in the transaction with local Mexican suppliers? (Maquila plant).....	161
Exhibit 49: Response to the question : What are the difficulties in transacting with the maquila plant? (Local Mexican supplier).....	162
Exhibit 50: The difficulties of the relationship with people in the maquila plants (Local Mexican supplier).....	162
Exhibit 51: Response to the question : What is the solution of corruption? (Maquila plant)....	164
Exhibit 52: Response to the question : What is the problem of corruption? (Local Mexican supplier).....	165
Exhibit 53: Response to the question : What is the solution of corruption? (Local Mexican supplier).....	166
Exhibit 54: Response to the question : How can RAMMAC supplier development program (supplier database) and cluster program develop? (Maquila plant).....	170
Exhibit 55: Response to the question : How can RAMMAC supplier development program (supplier database) and cluster program develop? (Local Mexican suppliers).....	173
Exhibit 56: Response to the question : How can cluster program develop? (Local government and Local university).....	175
Exhibit 57: Response to the question: How can capabilities of local Mexican suppliers increase? (Maquila plant).....	177

Exhibit 58: Response to the question : How can capabilities of local Mexican suppliers increase?  
(Local Mexican suppliers).....178

Exhibit 59: Response to the question : How can capabilities of local Mexican suppliers increase?  
(Local government and Local university).....180





## CHAPTER I

### INTRODUCTION

Human development is “about creating an environment in which people can develop their full potential and lead productive, creative lives in accord with their needs and interests” (UNDP, 2001, p.9). For the condition of human development, the first condition is the release from disease. The second condition is the release from poverty. These two conditions can be obtained and sustained by education. So, the third condition is education. These are recently recognized as conditions of human development (Anderson & Gerber, 2008).

The recent research into development focuses on the qualitative perspective or capability perspective (Anderson & Gerber, 2008 ; Cheshire & Malecki, 2004; Rocha, 2004; Sen, 1999; Stiglitz, 2003; Todaro, 2004; UNDP, 2004). For example, even if a quantitative index (e.g. income level in a region) increased, disparity in wealth might have deepened. In this case, education can be best emphasized as the factor to eliminate the social divide. Therefore, qualitative or capability development is recognized as being important to improve wellbeing (Anderson & Gerber, 2008 ; Rocha, 2004, 2006).

After the collapse of the Soviet regime, the ideological conflict between capitalism and socialism is no longer critical. Instead, many countries have focused on economic development (e.g., job creation). In this context of economic development, entrepreneurship is emphasized. Entrepreneurship is defined as “the discovery of opportunities and subsequent creation of new economic activity, often resulting in the creation of new organizations” (Rocha, 2006, p.118).

Entrepreneurship also means the creation of new businesses, products and services. If more businesses, products and services are created and provided, consumers will enjoy the benefits. It probably makes our lives more “abundant” and this society may be called an “entrepreneurial society” (Bargen, Freedman, & Pages, 2003). In this context, entrepreneurship is deeply related to development (Rocha, 2004). That is, entrepreneurship contributes to human, economic and regional development.

Multinational corporations (MNCs) have an important role in the economic development of developing countries with a major influence on domestic firms (Hill, 2007). Capability development of domestic firms is very important for the economic development in developing countries. In the present study, the relationship between entrepreneurship and development is explored at the firm level. How entrepreneurship in MNCs affects capability development of domestic firms is explored in the U.S.-Mexico border region.

### **Statement of the Problem**

The present study focuses on the impact of entrepreneurship on capability development in emerging markets<sup>1</sup>. This study uses the U.S.-Mexico border region as the research setting. The U.S.-Mexico border region is defined as all the states in the United States and all *municipios* (Mexico) that touch the U.S.-Mexico border (Anderson & Gerber, 2008).

The U.S.-Mexico border region has experienced rapid demographic and economic growth since 1950. Specifically, the maquiladora industry has brought the most drastic change in this region (Anderson & Gerber, 2008). “Maquiladora industry”, “Maquiladoras” or “Maquilas” refer

---

<sup>1</sup> An emerging market country is generally defined as having three characteristics (1) low per capita income (2) a rapid pace of economic development (3) government policies favoring economic liberalization, and a free market economy. Emerging markets include economies in Latin America, the Middle East, Southeast Asia, and Africa, and also transition economies such as China, Central and Eastern Europe, and the former Soviet Union (Hoskisson, Eden, Lau & Wright, 2000). In the present study, “emerging markets” and “developing countries” are interchangeably used.

to Mexico's export process zone (EPZ). Firms in the EPZ can often import raw and intermediary inputs duty free from any part of the world and process those goods with low-cost workers in developing countries. Finally, the firms export the finished product to another country and the finished product is further processed or sold to the final customer (Sargent & Matthews, 2001). Maquila plants are primarily subsidiaries of MNCs. Therefore, subsidiaries of MNCs have been an important driving force of economic development in the U.S.-Mexico border.

The maquiladora industry has experienced upgrading and capability building. In the beginning, the important characteristic was a simple assembly line. After that, advanced manufacturing technology (AMT) was introduced. As a result, technology intensity and capital intensity in the maquiladora industry has increased. Carrillo and Lara (2005) calls this industrial upgrading process first, second, third and fourth generations of maquiladora. The maquiladora industry is now a mixture of low-tech assembly facilities, medium-tech manufacturing plants, and advanced technology and capital intensity production systems (Bair & Gereffi, 2001 ; Carrillo & Huade, 1998; Sargent & Matthews, 2008).

Furthermore, the business environment in the maquiladora industry has changed. Specifically, Chinese EPZ has emerged as a rival primarily for low cost labor. Many maquilas have the choice to stay in Mexico or to leave Mexico. Reacting to the change of the business environment, maquila plants, that is, subsidiaries of MNCs in the U.S.-Mexico border region, have created various strategies (e.g. mass customization as a proximity strategy) (Sargent & Matthews, 2004, 2008).

In this context, the maquiladora industry in the U.S.-Mexico border is a good research setting to explore the relationship between entrepreneurship in MNCs and capability development of domestic firms in emerging markets. Specifically, Reynosa is an interesting city

to conduct this study. Reynosa is located in Tamaulipas, Mexico and at the same time on the U.S.-Mexican border across from McAllen, Texas. The population of Reynosa is approximately one million people. Reynosa is currently recognized as one of the fastest growing cities in the global economic scene. The experts label it one of the ten best places to invest in Mexico (Mexico Industrial Maps, 2007). The number of Reynosa maquila employees continued to increase (67,275 in October 2000, 72,492 in December, 2003 and 90,616 by December, 2005). In December 2006, the numbers of Reynosa maquila employees (96,105) was ranked third and was only behind the numbers of Cd.Juarez (236, 296) and Tijuana (164,880) (Maquila on-line directory, 2008). In the maquila contraction - the October 2000 to August 2002 period, compared to the other maquila regions, there was no significant drop in employment in Reynosa. Reynosa maquilas are well diversified in various industries that include electronics and automotives as primary industries. The country of origin of Reynosa maquilas are also various such as U.S., Europe and Asia (Sargent & Matthews, 2004).

From this perspective, Reynosa is a good research region for the present study. Therefore, for the relationship between entrepreneurship in MNCs and capability development of domestic firms in emerging markets, the present study investigates maquila plants in Reynosa and local Mexican suppliers in (or near) Reynosa.

The states in Mexico identify, evaluate, and support the development of suppliers. The goal is to support the local industrial sector and as a result meet the international quality standards and the requirements of the leading foreign industry. The state government implements the supplier development program. The main purpose of the supplier development program is to identify, approach and integrate the supply chain for foreign and national companies. The purpose of

supplier development allows the increase in direct and indirect local exports by small and medium-sized enterprises (SMEs) (Twin plant news, 2005).

In Reynosa, the supplier development program is implemented. Three programs primarily comprise the supplier development program in Reynosa. The programs are as follows ; Reynosa Asociación de Maquiladoras y Manufactureras, A.C.(RAMMAC)'s supplier database program, electric-electronics clusters program and government support programs for local Mexican suppliers. In the present study, maquila plants in electric-electronics cluster programs and local Mexican suppliers in RAMMAC supplier databases are investigated as the sample.

The following are the research questions in the present study: What are the entrepreneurship in MNCs? What are the characteristics of entrepreneurship in MNCs? What are the capabilities of domestic firms? How does entrepreneurship in MNCs affect capability development of domestic firms? How do domestic firms react and learn from MNCs, especially from entrepreneurship in MNCs? Do subsidiaries of MNCs learn from domestic firms? Specifically, do the capabilities of domestic firms affect entrepreneurship in MNCs? These research questions are empirically explored in the maquiladora industry, in particular maquila plants and local Mexican suppliers in (or near) Reynosa. So, the following are empirical research questions in the maquiladora context. What kind of entrepreneurial activities take place in maquila plants? What are the characteristics of entrepreneurial activities in maquila plants? What are the capabilities of local Mexican suppliers? How does entrepreneurial activity in maquila plants affect capability development of local Mexican suppliers? How do local Mexican suppliers react and learn from maquila plants, especially from entrepreneurial activities in maquila plants? Do maquila plants learn from local Mexican suppliers? Do the capabilities of local Mexican suppliers affect entrepreneurial activities in maquila plants?

These research questions converge to the following overall questions, i.e. while a large amount of investment has been made in maquiladoras for a long period of time, have the capabilities of the local Mexican suppliers actually developed? Specifically, have entrepreneurial activities in maquila plants contributed to capability development of local Mexican suppliers? If the answer is no, what are the reasons? Which actions should be implemented to achieve the capability development of local Mexican suppliers? Also, how can local Mexican suppliers develop absorptive capacity (Cohen & Levinthal, 1990) as the fundamental ability for capability development? These overall questions focus on the local Mexican suppliers.

### **Purpose of the Study**

The present study explores the impact of entrepreneurship on qualitative development. The research setting in this study is related to Mexico and Latin America, so the unique conditions in Latin American countries needs to be considered regarding the relationship between entrepreneurship and development.

Developing countries initially favoring economic growth tend to fall into a vicious cycle. However, developing countries with good human development and poor economic growth sometimes enter into a virtuous cycle (Ranis, Stewart & Ramirez, 2000). This tendency is especially true for Latin American countries. Development in Latin American countries must occur prior to or simultaneous with improvements in economic growth to get to a virtuous cycle (Ranis & Stewart, 2001). A focus on capabilities and linkages is expected to prepare the conditions for subsequent growth to spread widely across regions and sectors. In this condition, the goal must be more development rather than greater growth (Rocha, 2006). These qualifications mean that Latin American countries should focus more on the association between entrepreneurship and socio-economic development rather than economic growth. Entrepreneurial

activities coupled with low-quality growth and social divides lead to a vicious cycle. As a result, the vicious cycle hinders innovation and more importantly the human and social development in Latin America (Rocha, 2004, 2006). In this context, the present study contributes to research on qualitative development in Latin America.

There is much research on the impact of MNCs and foreign direct investment (FDI) on domestic firms and the domestic economy (Hill, 2007; Meyer & Sinani, 2005). Here, foreign direct investment (FDI) is defined as “direct investment in business operations in foreign countries” (Hill, 2007, p.720). However, recently many studies question whether there are the positive productivity externalities. The reasons are the difficulties such as separation of different effects, data limitations and establishment of the direction of the causality. For the purpose of overcoming these problems, researchers have started to focus on the impact of MNCs at the firm level (McKeon, Johnston & Henry, 2004). Some studies have examined the extent of linkages or spillovers between MNCs and the domestic firms at the product level (Aitken, Hanson & Harrison, 1997; Barrell & Pain, 1997 ; Djankov & Hoekman, 2000 ; Haskel, Pereira & Slaughter, 2007 ; Markusen & Vernables, 1999) and to domestic firms’ export behavior (Greenaway, Sousa & Wakelin, 2003). Also, some studies have examined the impact of MNCs on the formation and growth stage of local SMEs (Dutrenit & Vera-Cruz, 2005a; McKeon, Johnston & Henry, 2004). The present study contributes to the recent studies on the impact of MNCs on the local economy at the firm level.

Learning processes of domestic firms from MNCs is deeply related to the impact of MNCs on the local economy. However, there is little research, even though the topics are important. In much of the literature about technological spillovers from MNCs to domestic firms, most of the literature shows that spillovers do occur, but they do not give a detailed explanation of the



channels or specific mechanisms of knowledge transmission. In addition, there is limited analysis of the relationship between the spillovers and the technological, managerial and financial capabilities of the domestic firms, particularly at the local level (Dutrenit & Vera-Cruz, 2005a). The present study tries to fill this research void. Also, though it is important for emerging market firms to learn, there is comparatively little research on learning behaviors of local emerging market firms in the existing literature. Domestic firms strongly desire and need to learn new capabilities (e.g. technological, managerial and financial capabilities). The purpose is to develop their abilities to compete and gain a competitive advantage. However, the knowledge about how these firms learn has not been well advanced (Hitt, Li & Worthington, 2005). The present study also fills this research void.

The present study emphasizes entrepreneurship in MNCs subsidiaries. In the international business area, especially in the studies into MNCs, subsidiaries of MNCs are recognized as not a follower of the parent company but rather an actor in the network (Birkinshaw, 2001). Subsidiaries originate new business as a value creator. Furthermore, subsidiaries are recognized as having an active role for knowledge spillover or technology spillover from MNCs to domestic firms (Martin & Bell, 2006; Jindra, Giroud, & Scott-Kennel, 2008). The present study focuses on the effect of entrepreneurship in MNCs on the local economy. This study follows the recent research stream emphasizing subsidiary entrepreneurship and therefore, the present study contributes to the international business area.

## CHAPTER II

### LITERATURE REVIEW

#### **Entrepreneurship in Multinational Corporations**

##### **Definition and Importance of Multinational Corporations**

A multinational corporation (MNC) is a firm that has its headquarters in one country and extends itself over borders (Wilkins, 2001). MNCs now dominate the world economy. Overall, the average size of MNC sales is approximately \$18 trillion. MNCs, according to UNCTAD (2003), employ a total number of workers exceeding 53 million individuals. Importantly, the largest 500 MNCs explain over 90% of the world's stock of foreign direct investment (FDI) and conduct about half of the world's trade (Hill, 2007; Rugman, 2000; Verbeke, Chrisman & Yuan, 2007).

##### **Why Has Subsidiary Been Recognized as Being Important?**

In the past, MNCs were recognized as being centralized and hierarchically run organizations (Cerrato, 2006 ; Verbeke, Chrisman & Yuan, 2007). So, from this perspective, strategic decision making or entrepreneurial activities in subsidiaries were seldom present. Also, innovation was thought of as being created in the home country where MNC headquarters were located, as Veron's (1966) product life cycle hypothesis implies (Frost, 2001). However, recently MNCs are recognized as differentiated networks (Nohria & Ghoshal, 1997; Rugman & Verbeke, 2003). In this differentiated network perspective, each subsidiary provides new knowledge and is becoming a source of competitive advantage (Bartlett & Ghoshal, 1986; Cerrato, 2006; Hedlund,

1986; Verbeke, Chrisman & Yuan, 2007). That is, subsidiaries are not simple “implementers” but rather “strategic leaders” and “contributors” (Bartlett & Ghoshal, 1989). Furthermore, dispersion of subsidiaries provides diverse resources and capabilities from various regions. These diverse resources and capabilities are the source of innovation in MNCs (Lee & Williams, 2007). In these aspects, subsidiaries are not a simple value re-creator in MNCs but an innovator in MNCs (Andersson, Forsgren & Holm, 2002; Broojihawon, Dimitratos & Young, 2007; Cerrato, 2006 ; Frost, 2001 ; Ghoshal & Bartlett, 1986; Lee & Chen, 2003; Lee & Christopher, 2007; Paterson & Brook, 2002; Schmid & Schurig, 2003 ; Verbeke, Chrisman & Yuan, 2007)

### **What Is Entrepreneurship in Multinational Corporations?**

**General definition of entrepreneurship.** Entrepreneurship is a multifaceted field and is intertwined by diverse scholarly areas (Cooper, 2003; Low & MacMillan, 1988). So, studies of entrepreneurship have pursued different purposes, questions, units of analysis, theories and methodologies (Chandler & Lyon, 2001; Davisson & Wiklund, 2001; Low & MacMillan, 1988; Murphy, Trailer & Hill, 1996; Stevenson & Jarillo, 1990). As a result, there are various definitions of entrepreneurship (Chandler & Lyon, 2001; Ireland, Reutzell & Webb, 2005; Low & MacMillan, 1988; Shane & Venkatraman, 2000). As classical definitions, Schumpeter (1934) defined entrepreneurship as “carrying out new combinations.” Kirzner’s (1973) concept is closely related to “arbitrage and the ability to correctly anticipate where the next market imperfections and imbalances will be” (Low & MacMillan, 1988, p.140). Gartner (1989) defines entrepreneurship as the creation of new organizations. Shane and Venkataraman (2000) define entrepreneurship as the study into sources of opportunities, processes of discovery, evaluation, and exploitation of opportunities. Furthermore, Rocha (2004) defines entrepreneurship as the

discovery of opportunities and subsequent creation of new economic activity, often resulting in the creation of new organizations.

**Definition of subsidiary.** The artificial notion of a single parent-subsidiary relationship is far from reality. Today, subsidiaries as units in MNCs (Jindra, Giroud & Scott-Kennel, 2008) have a multitude of connections with other corporate entities in the home country and worldwide (Ghoshal & Bartlett, 1991). Most MNCs have preceded some variation of the global business unit structure in their international operations. Because of this trend, the “national subsidiary” does not exist in most developed countries anymore. Instead, there are a series of discrete value-adding activities such as a manufacturing plant and an R&D center. Each activity reports through its own business unit or functional line (Birkinshaw, 1997). In this aspect, subsidiary is here defined as “a discrete value-adding activity outside the home country, namely, at a level below the national subsidiary” (Birkinshaw, 2001, p.381), or “any operational unit controlled by the MNC and situated outside the home country” (Birkinshaw, 1997, p.207). This definition is proper because such entities can be readily identified. Also, the entities can be compared across countries and MNCs (Birkinshaw, 1997, 2001).

**Subsidiary role vs Subsidiary strategy.** A distinction between subsidiary strategy and subsidiary role is necessary to understand entrepreneurship in MNCs. The parent company assigns a subsidiary’s role and the subsidiary simply follows orders. That is, subsidiary roles are assigned by the parent company as the part of a wider MNC strategy (Jindra, Giroud & Scott-Kennel, 2008). On the other hand, subsidiary strategy means the choice or self-determination on the part of the subsidiary (Birkinshaw, 2001; Birkinshaw & Hood, 1998; Jarillo & Martinez, 1990; Manolopoulos, 2008; Paterson & Brock, 2002; Schmid, Schurig & Kutschker, 2002). For subsidiary’s strategy, some constraints, such as from above and by the marketplace, exist.

However, the decisions are not made by headquarter managers on their behalf but subsidiary managers instead. The subsidiary managers are near free agents. Subsidiary strategy is defined as “the positioning of the subsidiary vis-à-vis its competitors and its customers, and with regard to its underlying resources and capabilities” (Birkinshaw, 2001, p. 389). Specifically, the unique configuration and coordination of a firm’s activities creates the competitive advantage (Porter, 1996). In other words, a market-positioning component and resource development component in subsidiaries are two main components. Subsidiary strategy is about how those two components are organized (Andersson, Forsgren & Holm, 2002; Birkinshaw, 1997, 2001 ; Boojihawon, Dimitratos & Young, 2007; Lee & Chen, 2003 ; Lee & Williams, 2007; Schmid & Schurig, 2003).

**Definition of entrepreneurship in multinational corporations.** Entrepreneurship initiatives are managerial efforts to drive new ways of arranging the existing resources. The purpose of entrepreneurial initiatives is to achieve transformation or renewal of the existing organization (Guth & Ginsberg, 1990; Stopford & Baden-Fuller, 1994).

Why study entrepreneurship in MNCs? Though many firms get access to local markets through the subsidiary network, they appear to neglect the creative potential of their subsidiaries. Thus, entrepreneurship in MNCs or subsidiary’s entrepreneurship may be a relatively rare and underresearched phenomenon though it has the high potential value to the MNC (Birkinshaw, 1997).

In the present study, entrepreneurship in MNCs is defined with Birkinshaw’s pioneering studies (Birkinshaw, 1997, 2000; Birkinshaw, Young & Hood, 2005). Birkinshaw (1997, 2000) classified entrepreneurship into two types. The first perspective is Schumpeter’s view. Schumpeter views entrepreneurship as a process of creative destruction in which the

entrepreneur pushes the economic system out of equilibrium. The second perspective is Kirzner's perspective. Kirzner models entrepreneurship as an ongoing process of adjustment towards equilibrium (Birkinshaw, 2000). These two classical perspectives are extended into two distinct entrepreneurial processes to the MNCs (i.e. the 'internal entrepreneurship' and 'external entrepreneurship'). Internal entrepreneurship is related to corporate selection mechanisms such as legitimacy and approval. External entrepreneurship is associated with environmental selection mechanisms such as customer acceptance and survival (Birkinshaw, 1997, 2000; Birkinshaw, Young & Hood, 2005).

These two entrepreneurial processes are also extended into two forms of subsidiary initiatives. Initiative is here defined as "a discrete, proactive undertaking that advances a new way for the corporation to use or expand its resources" (Birkinshaw, 1997, p.207).

An initiative is essentially an entrepreneurial process. That is, the process of initiative is related to the identification of an opportunity and the commitment of resources to that opportunity (Birkinshaw, 1997; Rugman & Verbeke, 2001; Verbeke, Chrisman & Yuan, 2004). Two basic forms of subsidiary initiative are similarly associated with two forms of entrepreneurship. Externally oriented initiatives are similar to Schumpeterian entrepreneurship or external entrepreneurship. It is because they force the MNC to new products and markets. Internally oriented initiatives are similar to Kirznerian entrepreneurship or internal entrepreneurship (Birkinshaw, 2000).

Furthermore, Birkinshaw (1997, 2000) suggests three market opportunities. That is, the subsidiary is associated with the interface of three markets or three market opportunities - local market, internal market and global market. The local market comprises competitors, suppliers, customers, and regulatory bodies in the host country. The internal market comprises head office

operations and all corporate-controlled affiliates worldwide. The global market is composed of competitors, customers and suppliers that exist outside the local and internal markets (Birkinshaw, 2000). These three markets or market opportunities are deeply related to a network configuration perspective on MNCs (Bartlett & Ghosal, 1989, 1990 ; Cerrato, 2006; Hedlund, 1986; Lee & Williamson, 2007; Nohria & Ghosal, 1997; Prahalad & Doz, 1987). Specifically, internal markets are related to internal initiative, internal entrepreneurship and Kirznerian entrepreneurship. Local and global markets are related to external initiative, external entrepreneurship and Schumpeterian entrepreneurship (Birkinshaw, 1997, 2000; Cerrato, 2006).

Finally, in the present study entrepreneurship in MNCs is defined as alertness to market opportunity (Birkinshaw, 1997, 2000). This definition is related to the notion that entrepreneurial process lies in the identification of an opportunity to use or expand the corporation's resources, so this conceptualization is not strange in the literature (Kirzner, 1973; Stevenson & Jarillo, 1990). However, modeling the internal and external markets to the MNC is an extension of traditional usage.

Besides Birkinshaw's pioneering studies, Lee and Williamson (2007) suggest the phenomenon of dispersed entrepreneurship in large MNCs. A MNC entrepreneurial community is composed of many actors such as subsidiaries and individuals (or entrepreneurs) in geographically diverse regions of MNCs. The MNC is evolved by these communities. This community connects participants with a shared desire to create new knowledge for international competition. Boojihawon, Dimitratos & Young (2007) classify the locus of subsidiary entrepreneurship into subsidiary-driven entrepreneurship, headquarter-driven entrepreneurship and subsidiary and headquarter jointly-driven entrepreneurship. In a study of six cases of Taiwanese manufacturing firms doing business in south Asia, Lee & Chen (2003) show that

subsidiary's entrepreneurial initiatives play an important role in achieving the required extent of local adaptation and successful implementation for firms lacking adequate experiential knowledge of internationalization.

### **Learning Process of Domestic Firms from Multinational Corporations**

In the present study, domestic firms are local Mexican suppliers that provide the components. The components are indirectly or directly used to make products in subsidiaries of MNCs, that is, maquila plants. Specifically, the learning process of local Mexican suppliers from maquila plants is investigated.

There are many literatures that focus on how firms in developing countries acquire technological capabilities (Ariffin & Figueiredo, 2004; Bell & Pavitt, 1995; Figueiredo, 2002 ; Immarino, Padilla-Perez & Tunzelmann, 2008; Katz, 1987; Kesidou & Romijn, 2008; Kim & Nelson, 2000; Lall, 1992; Park, Choung & Min, 2008). These literatures research the learning processes included in the gradual build-up of a minimum basis of technological knowledge for innovative activities. From these literatures, learning is defined as a process that includes repetition and experimentation, which can carry out tasks in a better and faster way, and identify new production opportunities (Dutreniz & Vera-cruz, 2005). Firms create knowledge and acquire technological capabilities through this learning process.

Although there is little research on the learning process of local suppliers from MNCs, several relevant literatures are introduced in the next sections.

### **General Definition of Learning**

Learning is “a change in a system that produces an increase in its capacity for adapting to its environment” (Young & Sexton, 1997: 223; Recitation from Simon (1981)). Organizational



learning<sup>1</sup> is the collective learning by members of the organization. Essential processes in organizational learning are the following ; (1) the discovery of relevant new knowledge (2) the diffusion of this knowledge to people in the organization who need it and (3) the application of the knowledge to improve internal processes and external adaptation. Successful application of new knowledge contains institutionalizing it in a way that will ensure it is maintained as long as it remains relevant (Easterby-smith, Crossman & Nicolini, 2000 ; Fiol & Lyles, 1985; Huber, 1991; Kim, 1998 ; Levitt & March, 1988; Teece, Pisano & Shuen, 1997 ; Yukl, 2008).

Specifically, interorganizational learning is the collective learning of organizations in formal interorganizational collaborations such as strategic alliances and networks (Holmqvist, 2004 ; Lane & Lubatkin, 1998 ; Lane, Salk & Lyles, 2001; Larsson, Bengtsson, Henriksson & Sparks, 1988).

### **Learning Behaviors of Domestic Firms from Foreign Entrants**

Foreign entrants from developed countries enter emerging markets because of resource seeking and opportunity exploring purposes (Hitt, Hoskisson & Kim, 1997; Uhlenbruck, Meyer, & Hitt, 2003). Domestic firms in emerging markets are generally resource poor because of underdeveloped local strategic factor markets such as financial markets and human capital markets. Khanna & Palepu (1997) call this weak environment ‘institutional deficits’. So, emerging market firms often need resources but these resources are often difficult to acquire. As a result, these firms must learn in order to adapt to their changing environment. Foreign firms not only force domestic firms to learn proactively but also provide opportunities for them to acquire

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<sup>1</sup> Individual learning and organizational learning are necessary to be distinct. Individuals are the important actors in learning and knowledge creation. They form capabilities that may be combined at the organizational level. However, organizational learning is not the simple sum of individual learning. Individual learning and capabilities are translated into organizational learning and capabilities by only effective organizations (Ernst & Kim, 2002). Organizations, unlike individuals, develop and maintain learning systems. Those learning systems not only influence their immediate members, but are then transmitted to others by means of organization histories and norms (Fiol & Lyles, 1985).

the needed knowledge. That is, domestic firms can achieve an advantage when they learn and leverage the knowledge gained from foreign entrants to improve their capabilities (Hitt, Li & Worthington, 2005; Mathews, 2002).

Hitt, Li and Worthington (2005) suggest the learning behaviors of local emerging market firms from foreign entrant firms (Figure 1).

Figure 1

Learning Approaches – Local Emerging Market Firms  
(Hitt, Li & Worthington, 2005)

Process of learning	Cooperative-exploratory learning	Cooperative-exploitative learning
	Experiential – exploratory learning	Experiential – exploitative learning
		Type of learning

Two basic types of learning behaviors of domestic firms are exploratory learning and exploitative learning (March, 1991). Exploratory learning often contains experimentation with new alternatives. The organization obtains major additions of knowledge to its knowledge stock through exploratory learning. Alternatively, exploitative learning extends the existing capabilities. Overall, exploitive learning is likely to be more incremental (Ahuja & Lampert, 2001). On the other hand, exploratory learning is likely to be more innovative and unique (Hitt, Li & Worthington, 2005; Holmqvist, 2004; Levintal & March, 1993; Marengo, 1994).

Cooperative and experiential learning processes can be used for two basic types of learning (Holmqvist, 2004). Cooperative learning or interorganizational learning is obtained through collaboration with partners (Larsson, Bengtsson & Sparks, 1998). On the other hand, experiential learning or intraorganizational learning takes place within organizations (Argote & Ophir, 2002).

The main source of experiential learning is the individual organization's own experiences, some of which may be intentionally designed for learning. Finally, learning behaviors of domestic firms can be classified into four approaches: cooperative exploratory learning, cooperative exploitative learning, experiential exploratory learning, and experiential exploitative learning (Hitt, Li & Worthington, 2005).

Cooperative-exploratory learning is to build new knowledge that is largely unassociated with the firm's current knowledge stocks and work with partners to co-create the new knowledge. Cooperative-exploitive learning is to enhance a firm's current knowledge stock. It is through transferring knowledge between partners in ways that allow a firm to exploit its current knowledge. Experiential learning is to add to a firm's knowledge stocks through experiencing new contexts. It often includes building tacit knowledge through learning by doing. Experiential exploratory learning means that the knowledge created is new and unrelated to the firm's current knowledge stocks. On the other hand, experiential exploitative learning means the knowledge added is more incremental and assists the firm in exploiting its current knowledge stocks (Hitt, Li & Worthington, 2005).

For the domestic firms that are resource poor, cooperative-exploratory learning can be dominant. Absorptive capacity (Cohen & Levinthal, 1990) has an important role in the cooperative exploratory learning process. Absorptive capacity is defined as a firm's ability "to recognize the value of new and external knowledge, assimilate it, and apply it to commercial ends" (Cohen & Levinthal, 1990, p.128). Absorptive capacity provides domestic firms in emerging markets with the ability to absorb technological, managerial, and marketing resources from foreign partners (Gray, 2006; Lane & Lubatkin, 1998; Lane, Salk & Lyles, 2001; Zahra & George, 2002). When domestic firms have a lower level of absorptive capacity, a much closer

working relationship with the foreign partners is required to facilitate their learning. The quality of relation between domestic firms and foreign firms has a role as relational capital for the learning process. In other words, when the level of absorptive capacity is low, domestic firms must 'learn by doing' and keep close relationships with their partners (Hitt, Li & Worthington, 2005; Lane & Lubakin, 1998).

### **Technological Spillover Process**

MNCs are recognized as a channel of diffusion of knowledge and technology. MNCs can contribute to promote the economic development process in host countries by means of technological spillover effects (Aitken & Harrison, 1999; Altenburg, 2000; Blomstrom & Kokko, 1998, 2003; Gorg & Strobl, 2001; Haskel, Pereira, & Slaughter, 2002; Marin & Bell, 2006). The technological spillovers are defined as “transfers of knowledge and skills (technical and organizational) from MNCs that result in an improvement in the performance of partner, supplier or competitor firms, as well as of the other agents they interact with” (Dutrenit & Vera-Cruz, 2005a, p.275).

Primary mechanisms of technological spillovers are as follows : (1) demonstration effects. Domestic firms imitate foreign firms. (2) competition effects – MNC or FDI increases the competition in the emerging markets. So, capabilities of domestic firms improve (3) labor force spillover - Labor forces that experience to working in MNCs achieve technological or managerial capabilities. Sometimes they are hired by domestic firms or they create firms (Aitken & Harrison, 1999; Blomstrom & Kokko, 1998; Chung, 2001; De Fuentes & Dutrenit, 2007 ; Gorg & Greenaway, 2002 ; McKeon, Johnston & Henry, 2004; Dutrenit & Vera-Cruz, 2005a) (4) linkages between MNC and domestic firms (Chew & Yeung, 2001; De Fuentes & Dutrenit, 2007; Flores, Fontoura & Guerra, 2000; Kinoshita, 1998; Proenca, Fontoura & Crespo, 2001)

and (5) Training effects (to acquire abilities) (Blomstrom & Kokko, 2003; Chung, Mitchell & Yeung, 2003; De Fuentes & Dutrenit, 2007; Gorg & Strobl, 2001).

Specifically, in a study of local Mexican suppliers in a machining shop industry, De Fuentes and Dutrenit (2007) emphasize three knowledge spillover mechanisms, i.e. backward linkages, human capital accumulation and mobility, and training effects. According to their explanations, knowledge spillovers through backward linkages can promote SMEs' capacities in two ways, especially in supply relationships. First, buyers (clients) establish supportive linkages to supplier firms. The linkages can help other firms to increase their capabilities directly. Second, buyers (clients) put some pressure on their suppliers. As a result, suppliers make more efficient efforts at producing the inputs that reach buyers' requirements of quality, quantity, delivery time and price. For human capital accumulation and mobility, knowledge spillover through human capital mobility is related to the development of skills of local employees. Large firms increase employees' skills. As a result, large firms increase the stock of human capital. When employees move to other firms, new technology and new management techniques are transferred with them. This mechanism is recognized as one of the most important spillover mechanisms. For knowledge spillovers regarding training, training effects means that SMEs' employees are trained by their buyers (clients). Finally, De Fuentes and Dutrenit (2007) observe that from the sector and locality researched, large firms are an important source of training, which can be recognized as an important knowledge spillover mechanism.

In addition, Marin and Bell (2006) suggest three technological spillover models - pipe line model, absorptive model and subsidiary role model. First, pipe line model shows the direct technological transfer through parent company to subsidiary firms and from subsidiary firms to domestic firms. Spillover affects the rise from FDI. However, the spillover effects are

independent to both the absorptive capabilities of domestic firms and the knowledge-creating and accumulating activities of subsidiaries in the host country (Caves, 1974; Globerman, 1979 ; Gorg & Strobl, 2001; Keller & Yeaple, 2003 ; Lipsey, 2004). Second, the absorptive capacity model shows that domestic firms' absorptive capacities have the critical role for technology spillovers (Konings, 2001; Kokko, 1994). Third, the subsidiary role model suggests that subsidiaries develop the technological capabilities and have critical and independent roles for technological spillover (Molero, 2003; Todo & Miyamoto, 2002)

### **Technological Assistance from Multinational Corporations to Local Suppliers**

Ivarsson and Alvstam (2007) show the meaningful findings about technological transfers from MNCs to local suppliers in developing countries. For backward linkages between foreign affiliates and local suppliers, MNC subsidiary plants assist local suppliers technologically (Dunning, 1993; UNCTC, 1981). Ivarsson and Alvstam (2007) suggest two types of technological assistance. The first assistance is about product-related technology. The product-related technology assistance includes the condition of proprietary product expertise. This type of technology assistance is through the following forms - patents and licenses, the transfer of product designs and technical specifications, technical consultations, and regular feedback on product performance. The second assistance is about process-related technology assistance. The process-related technology assistance is through the following: machinery and equipment, technical support in product planning, quality management, inspection, testing, advice on tooling, maintenance, product layout, and operations. Furthermore, MNCs can transfer organizational and managerial knowledge and offer various forms of training programs (Ivarsson & Alvstam, 2007).

## Knowledge Transfer Mechanism

Ernst and Kim (2002) show rare and valuable models to explain knowledge diffusion processes in the global production network, i.e. knowledge transfer mechanism and local capability formation process. Recently, the hierarchical structure of MNCs has disappeared and global production networks have appeared (Borras, Ernst & Haggard, 2000). This global production network has various actors (Ernst, 2002). Affiliates or subsidiaries of MNCs and local suppliers are actors in the global production network. Therefore, knowledge transfer and capability formation processes in global production networks are related to learning processes between subsidiaries of MNCs and local suppliers.

Ernst and Kim (2002) suggest four knowledge transfer mechanisms between global flagships and local suppliers (Figure 2)

Figure 2

Knowledge Transfer Mechanism (Ernst & Kim, 2002)

		The role of local suppliers	
		Passive	Active
Market mediation	Market Mediated	Formal mechanisms (FDI, FL, turnkey plants, technical consultancies)	Commodity trade (Standard machinery transfer)
	Non-market Mediated	Informal mechanisms (MNC provides technical assistance to local suppliers)	Informal mechanisms (reverse engineering, observation, literature)

Global flagships are companies or manufacturers which dominate in the global production network (e.g. brand leaders like Cisco, IBM, Dell and contract manufactures like Flextronics, Solectron) (Rugman & D’Cruz, 2000). For knowledge transfer mechanisms, there are two

dimensions (Kim, 1991). The first axis is the role of local suppliers. Local suppliers may have an active or passive role. The second axis is market mediation. That is, knowledge transfer is through the market or non-market venues. There are four classifications: for quadrant 1, local suppliers may have the passive role and knowledge transfer is through the market. This case is a formal mechanism. The examples are foreign direct investment (FDI), foreign licensing (FL), turnkey plants and technical consultancies (Reddy & Zhao, 1990). For quadrant 2, local suppliers have the active role. The transfer is also through the market. These cases are the standard machinery transfer and commodity trade (Abernathy & Townsend, 1975). Quadrants 3 and 4 are informal mechanisms. Various informal mechanisms transfer a large amount of knowledge (Ernst, 2000). For quadrant 3, local suppliers have the passive role and the transfer is through non-market venues. These cases are informal mechanisms. MNCs provide technological assistance to local suppliers. For quadrant 4, local suppliers have the active role and knowledge transfer is through non-market venues. These cases are informal mechanisms, reverse engineering, observation etc. (Ernst & Kim, 2002). In the emerging markets or developing countries, local suppliers have difficulty taking an active role. Therefore, passive-market mediated knowledge transfer mechanism or passive non-market mediated knowledge transfer mechanism can be the common case.

In conclusion, learning of local suppliers from MNCs is (1) learning of emerging market firms from foreign entrants (2) learning of local suppliers in the technology (or knowledge) transfer process.



## **Capability Development of Domestic Firms**

### **Definition of Capability**

Over the last few decades, a large amount of knowledge of capabilities has been developed in the literature. Most concepts of capability have been advanced around the resource-based view and the strategy field. The focus has been about developing advantage in relation to competitors. The root of this research stream is the earlier studies such as Chandler (1962) and Penrose (1959). These earlier studies discussed notions of resources and products or services made by resources. Many studies investigated intra-firm capabilities focusing on their role in the competitive advantage of firms. The main topic of those studies is how easily resources could be imitated by competitors (Barney, 1986, 1991; Grant, 1990; Prahalad & Hamel, 1990; Rumelt, 1987; Wernerfeldt, 1984).

The main topics of capabilities for the resource-based researchers were to understand why larger firms develop scarce resources and critical capabilities in a competitive environment (Foss & Knudsen, 2003). Thus, their studies have dealt with the performance of firms and why some firms were more successful than others within their industry. So, the resource-based view has focused on the criteria for capabilities to contribute to success and sustainable competitive advantage, rather than how capabilities are developed (Johnsen & Ford, 2006).

Several authors in the strategic management literature have tried to distinguish between resources and capabilities. Resources are thought to be transferable input factors controlled by the firm, that are converted into outputs using various firm assets and bonding mechanisms such as technology, management information systems, incentive systems etc. For example, resources are financial or physical assets and human capital (Amit & Schoemaker, 1993; Johnsen & Ford, 2006). Amit & Schoemaker (1993) define capabilities as “a firm’s capacity to deploy resources,

usually in combination, using organizational processes, to effect a desired end” (Amit & Schoemaker, 1993, p.35). In addition, capabilities refer to invisible, firm-specific assets that are developed over time through complex interactions among the firm's resources (Teece, Pisano & Shuen, 1997).

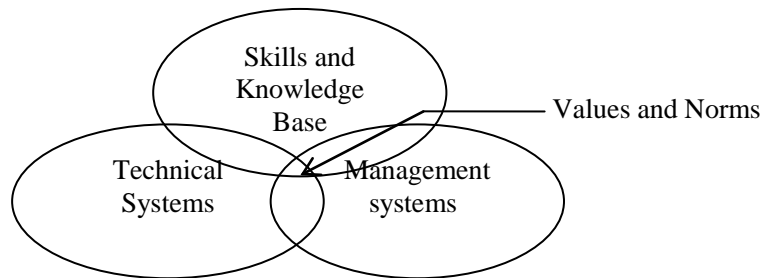
### **Definition of Supplier Capability**

The strategy literature is discussed to show core capabilities for a firm's ability to take advantage of opportunities. Specifically, the following concepts can be understood in this context ; core competencies (Prahalad & Hamel, 1990), core capabilities and rigidities (Leonard-Barton, 1992) and dynamic capabilities (Teece, 1998; Teece, Pisano & Shuen, 1997). The assumption that the firm operates as a discrete organization is included in these basic concepts. Specifically, supplier capability is understood in the relationship with buyers. Therefore, a network and relationship approach is valuable to understand supplier capabilities. This network and relationship approach focuses on the interaction between small and medium-sized suppliers and their customers. In this context, understanding capabilities in networks (Ritter, 1999) and relationships (Johnsen, 2005) is necessary. It is also necessary to develop an understanding of not only the capabilities existing in firms, but also those present in the relationships between suppliers and customers.

The seminal work of Leonard-Barton (1992) provides a base for understanding the set of capabilities that may exist within firms. Through twenty case studies of new product and process development projects in five firms, Leonard-Barton (1992) particularly focused on the interaction with new product and process development projects. Leonard-Barton (1992) suggested four dimensions of core capabilities (Figure 3).

Figure 3

Four Dimensions of Core Capability (Leonard-Barton, 1992)



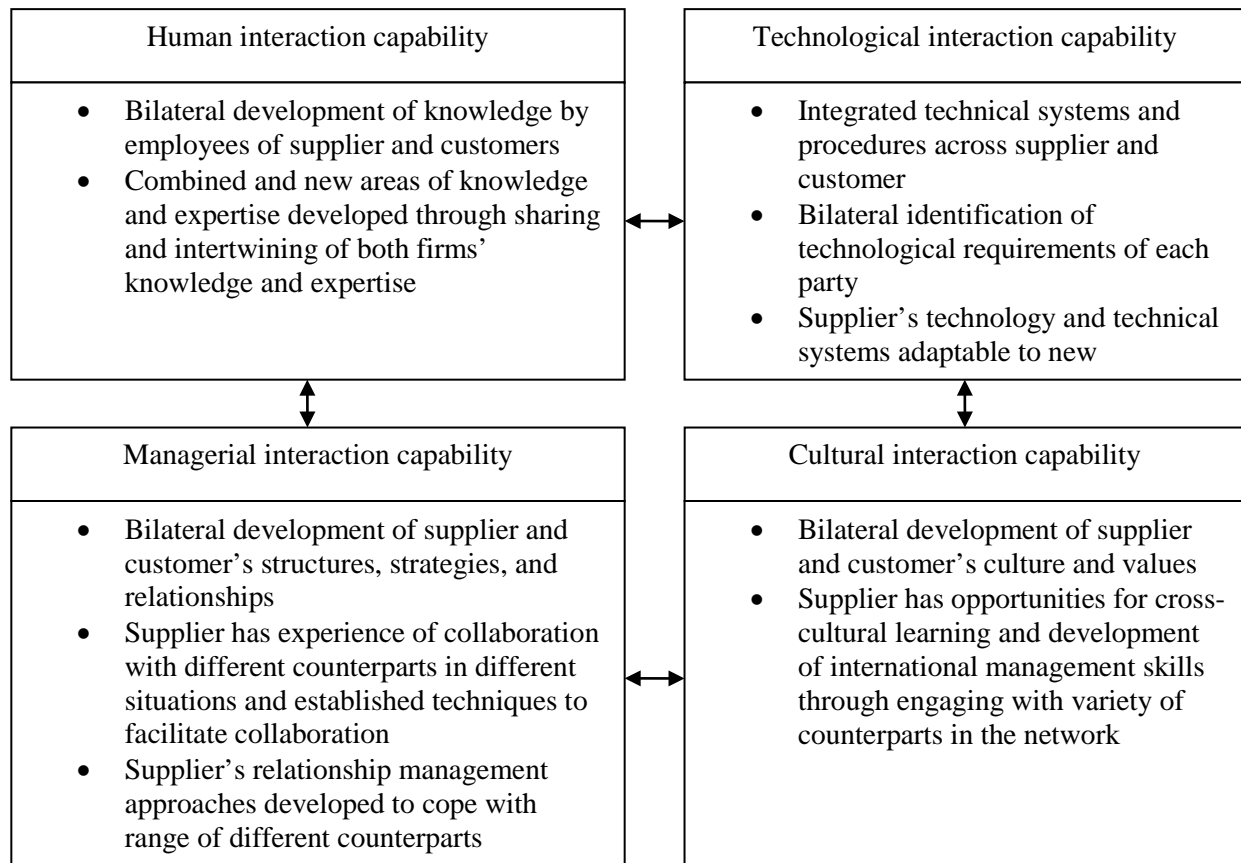
The first dimension is skills and knowledge base. This refers to “firm-specific techniques and scientific understanding embodied in employees.” The second dimension is technical systems. This means “information and knowledge embedded in technical systems and procedures.” The third dimension is managerial systems which refers to “formal and informal ways of creating knowledge through, e.g. networks, and controlling knowledge through, e.g. incentive systems and reporting structures.” The fourth dimension is values and norms. This refers to “the value assigned within the company to the content and structure of knowledge, means of collecting knowledge and controlling knowledge.” (Philipsen, Damgaard & Johnson, 2008, p.26). Finally, when capabilities are thought to be strategically important to a firm, they are called “core capabilities”.

An analysis of four dimensions of capabilities, their interdependent development and the ways in which capability development is managed may have an important influence on relationships. Suppliers may use their capabilities to make them change their position in their relationships with customers and in the wider network (Johnson, 2005). It seems critical for suppliers to understand two points - (1) the ways in which capabilities are developed, especially in relation to or in conjecture with their relationship counterparts (2) and what types of capabilities are most valued by customers (Philipsen, Damgaard & Johnson, 2008).

In a similar context, through eight in-depth case studies comprising forty-eight interviews with smaller UK textile suppliers in relationships with larger customers, Johnson and Ford (2006) suggest the interaction capability of smaller suppliers in relationships with larger customers (Figure 4). The four elements of interaction capability are based on the fundamental concepts (i.e. four elements of core capabilities) of the seminal work of Leonard-Barton (1992).

Figure 4

A Conceptual Framework to Examine Smaller Suppliers' Interaction Capability Developments in Relationships with Larger Customers (Johnson & Ford, 2006)



This interaction capability enables suppliers to cope and better manage in relationships with larger customers. That is, the resources of a company are integrated and activated through the interaction with other parties.

## **Supplier Development**

Supplier development is “a firm’s undertaking to improve its supplier’s capabilities” (Sako, 2004, p.281). Supply development is a procedure carried out by a firm to help develop its supplier’s capabilities. Specifically, supplier development can be understood as a firm’s attempt to transfer (or replicate) some aspects of its in-house organizational capability across firm boundaries (Sako, 2004). Sako (2004) classified supplier capabilities into three levels. The first capability is the most basic level of ‘maintenance capability’ (i.e. the ability to maintain a particular level of performance consistently). The second capability is ‘improvement capability’, which influences the pace of performance improvements; and the third capability is the highest level of ‘evolutionary capability’ (i.e. capability for capability building).

Keeping a network of capable suppliers is one of the purchasing function’s primary objectives. As firms focus on their core competencies, they rely upon suppliers more. Thus, for the competition, suppliers’ performance and capabilities must be equal to or greater than the performance and capabilities of the firm’s competitors. However, firms report that suppliers’ performance and/or capabilities are often lacking. Specifically, critical areas are the following; quality, delivery, cost reduction, financial health, adopting new technologies, and handling design changes. Thus, many firms actively assist supplier performance and capability improvements through supplier development. Here, supplier development is defined as “any effort of a firm to increase performance and/or capabilities to meet the firm’s short- and/or long-term supply needs” (Krause, 1997, p.12). There are two types of supplier development. That is, supplier development may range from limited efforts to extensive efforts (Rogers, Purdy, Safayeni & Duimering, 2007). The limited efforts (or narrow approach) of supplier development are efforts such as informal supplier evaluation and a request for improved performance. The

extensive efforts (or broad approach) are efforts such as training of the supplier's personnel and investment in the supplier's operation. Varieties of activities are used to develop suppliers' performance and/or capabilities. Some important activities are the following ; "introducing competition into the supply base, evaluating the supplier as a precondition to further supplier development activities, raising performance expectations, recognizing good supplier performance, promising future benefits, training and educating the suppliers' personnel, exchanging personnel between the buying firm and the supplier, and investing directly in the supplier." (Krause, 1997, p.13; Hartley & Jones, 1997; Rogers, Purdy, Safayeni & Duimering, 2007).

Furthermore, supplier development programs are defined as "long-term cooperative effort(s) between a buying firm and its suppliers to upgrade the suppliers' technical, quality, delivery, and cost capabilities to foster ongoing improvements" (Watts & Hahn, 1993, p.12). A supplier development program is different from a supplier evaluation or assurance program. A supplier evaluation or assurance program rates the performance of suppliers with the aim to assure that they meet or exceed some criteria (Giannakis, 2008). There are two objectives of supplier development programs (1) "to make immediate changes in the supplier's operations to reduce problems and (2) to increase the supplier's ability to make its own improvements" (Hartley & Jones, 1997, p.24).

### **Managerial, Technological and Financial Capabilities as Supplier Capabilities in the Emerging Markets**

Hitt, Dacin, Levitas, Arregle and Borza (2000) and Hitt, Ahlstrom, Dacin, Levitas and Svobodiana (2004) indicates that firms in emerging markets seek managerial and technological capabilities and search for the foreign partners who have those capabilities. In this aspect, for the

firms in the emerging markets, managerial and technological capabilities can be recognized as important dimensions for capability development.

Dutrenit and Vera-Cruz (2005a) investigate the spillovers from the MNCs through worker mobility toward SMEs. They focus on what extent the firms created by former employees of the MNCs have larger technological and managerial capabilities than those whose owners did not have this previous experience. For Mexican suppliers in the machine shop sector, there is a positive relationship among three factors such as the previous experience of the SMEs' owners in the maquilas, the specific job position occupied by the firms' owners, and the technological and managerial capabilities of the firms. In this study, they operationalize technological capabilities as the professional formation of employees, their experience with different kinds of production equipment, their training activities, the number and type of production equipment, and quality certification process. They operationalize managerial capabilities as the age of the machine shops, the professional formation and previous experience of the owners, the training courses taken by the machine shops' owners and the ownership of a sales or production site.

Newbert, Kirchhoff and Walsh (2007) suggest two resources of small and medium enterprises (SMEs) - managerial capabilities and technological competences - analyzing historical data on the entire population of new independent firms started worldwide in the semiconductor silicon industry for the first 50 years of its existence. They define managerial capabilities as skills, knowledge, and experience that facilitate one to handle difficult and complex tasks in management and production. Newbert, Kirchhoff and Walsh (2007) operationalize managerial capabilities as follows; each founder's prior start-up experience, sales and marketing experience, and industry experience at the time of founding. They also define technological competency as "the ability to apply scientific and technical knowledge to develop

and improve products and processes” (McEvily, Eisenhardt, & Prescott 2004, p.713). Because technological competencies are the knowledge-based resources, they use the literature on knowledge in order to define the dimensions of this construct. In this aspect, they operationalize technological capabilities as technological know-how and technological knowledge.

Luo (2002) examines what Chinese firms are looking for from foreign partner contribution, especially in the international cooperative ventures (ICVs). Luo (2002) shows that foreign partners’ technological capability and managerial skills are positively associated with Chinese firms’ satisfaction with ICV performance. In this study, technological capabilities are operationalized as follows (1) product development and innovation skills (2) process design and innovation skills (2) technological development skills (4) quality control skills (5) transparency of technology transfer. Also, managerial capabilities are operationalized as follows; (1) human resource management skills (2) effectiveness of organizational structure (3) level of employee participation in management (4) managerial and administrative efficiency (5) blending of cultures and management styles with partners (Luo, 2002).

Desarbo, Benedetto, Song and Sinha (2005) re-examine the Miles and Snow strategic type framework focusing on the interrelationships with several theoretically relevant variables such as strategic business unit (SBU)’s strategic capabilities, environmental uncertainty, and performance. For survey data obtained from 709 firms in three countries (China, Japan, United States), they evaluate the technological capabilities of business units as follows : new product development capabilities, manufacturing processes, technology development capabilities, ability of predicting technological changes in the industry, production facilities and quality control skills. Also, they evaluate the managerial capabilities of business units as follows; integrated logistics systems, cost control capabilities, financial management skills, human resource



management skills, accuracy of profitability and revenue forecasting and marketing planning process.

Kumar, Kumar and Grosbois (2008) investigate the key factors that influence the ability of hospitality organizations to develop technological capability through innovation. The focus of analysis is not on the institutional context, but on the hotel and tourist companies. The relationship among following variables in the theoretical framework is tested with the data on innovation projects from 62 Cuban hospitality companies; the type of innovation undertaken by the firm, the firm's managerial capabilities, learning culture, organizational structure, systems and procedures, technological absorptive capacity and level of government support with the level of technological capability. They operationalize technological capabilities as investment capability, operational capability and dynamic learning capability. They operationalize managerial capabilities as leadership and employee support, knowledge and technical expertise, group management skills and project management skills.

In addition, there is much research that focuses on how firms in developing countries acquire technological capabilities (Ariffin & Figueiredo, 2004; Bell & Pavitt, 1995; Immarino, Padilla-Perez & Tunzelmann, 2008; Figueiredo, 2002; Katz, 1987; Kesidou & Romijn, 2008; Kim & Nelson, 2000; Lall, 1992 ; Park, Choung & Min, 2008). These literatures research the learning processes included in the gradual build-up of a minimum basis of technological knowledge for innovative activities. Specially, if measures of technological capabilities in the recent literatures are introduced, they are the followings: Immarino, Padilla-Perez and Tunzelmann (2008) suggests technological capabilities of domestic firms in Mexico in two dimensions of "types of capabilities (i.e. process organization/product-centered)" and "levels of capabilities (basic/intermediate/advanced). In a study of technology spillover in a Korean semiconductor and

electronics industry, Park, Choung and Min (2008) cite Kim's (1997) definition of technological capability -"the ability to make effective use of technological knowledge to imitate and assimilate existing technologies, create new technologies, and develop new products and processes in response to the changing economic environment" and suggest three indicators of technology, human resources, organization, and network. In a study of technological capability accumulation in Brazilian firms, Figueiredo (2002) suggests technological capability in two dimensions of technological functions and related activities and level of technological capabilities (routine-basic/renewed/extra basic/pre-intermediate, innovative-extra basic/pre-intermediate/high intermediate /advanced). In a study of firms in the electronics industry in Brazil and Malaysia, Ariffin and Figueiredo (2004) suggest technology capabilities in two levels of capability type (project management/equipment, tool and die, metal stamping, plastic molding/process and product organization/product-centered) and level of capability built within firms (basic operation level, basic innovative capability level, intermediate innovative capability level, advanced innovative capability, research based innovative capability level).

In emerging markets, local strategic factor markets such as financial markets are generally undeveloped. This is kind of 'institutional deficit' (Khanna & Palepu, 1997). Many local suppliers in emerging markets may have difficulty in accessing the financial market. Also, many local suppliers are small and medium sized firms (SMEs), so they may be financially fragile. In this aspect, for the local suppliers in the emerging markets, financial capability can be recognized as another important dimension of capability.

In the study of building the model for the competitiveness of large construction companies in China, Cheah, Kang and Chew (2007) measure financial capabilities. The motive of their study is despite high growth economy, some construction companies have the difficulties

because of low profitability. In the study, they measure financial capability as follows; especially according to their comment, there is serious lack of financial resources and distribution channels to many construction companies. So, first, the ability to acquire financing from banks or other financial institutions is suggested as one important ability to be developed. Second, a company's foresight in making strategic investments and project investments is suggested. Third, accounting and financial management is suggested.

Luo (2002) investigates what Chinese firms want from foreign partner contributions in international cooperative ventures (ICVs). Strategic, organizational and financial attributes are examined in particular as a foreign partner's actual strength. Financial attributes are operationalized as follows: ability to reduce cost, ability to allocate and utilize capital and ability to manage assets.

Camuffo, Furlan and Rettore (2007) examine the risk sharing between buyers and suppliers in the Italian high precision air conditioning (AC) industry. In their study, financial stability is measured as suppliers risk aversion. That is, they measure the financial stability of suppliers as the supplier's capability of absorbing financial turbulence. If the supplier is more financially stable, the risk aversion of suppliers is lower. That is, though there is no support from external entities, suppliers can face unpredictable financial turbulence well.

From the above measures, local suppliers in the emerging markets need to have financial capabilities such as access to financial institutions, foresight in making strategic investments, financial stability and accounting and financial management.

## **Governance Structure and Local Embeddedness as Moderating Contexts**

The governance mechanism and the degree of embeddedness of large foreign firms are important for firm and regional development in the emerging markets. The reason is that a hierarchical coordinating mechanism coupled with a lack of embeddedness in the region potentially results in social divides. Social divides increase inequality. Inequality is a key indicator of regional development in Latin American countries. Latin American countries are the most inequitable in the world. Inequality resulting from social divides increases growth, but obstructs economic, socio-institutional, and human development because it negatively influences the formation of capabilities and the formation of a stronger socio-economic and institutional organization (Rocha, 2004). In this context, governance structure between local suppliers and MNCs, and the local embeddedness of MNCs can be recognized as being important moderating contexts for the learning process of local suppliers.

### **Governance Structure in Supply Chain**

Supply chain is broadly defined as networks of manufacturing and distribution sites that procure raw materials, transform them into intermediate and finished products, and distribute the finished products to customers (Lee & Billington, 1993). Buyers and suppliers are primary players in the supply chain.

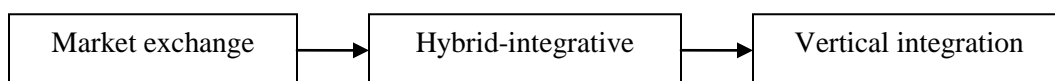
In advanced modern economies, interfirm co-specialization has characterized the value chain (Alchian & Demsetz, 1972). Individual firms often make investments in specialized assets, especially uniquely adapted to the exchange relationship. Productivity is enhanced and rent is produced by these transaction/relation-specific investments (Perry, 1989). However, as specialization increases, cost increases. More technically, when economic actors make relation specific investments, transaction costs rise because of the fear of opportunism. According to

transaction cost economics (TCE) theorists' argument, "governance structures" are necessary when transactors make specialized investments because of the "opportunism" problem (Dyer, 1996, 1997; Dyer & Singh, 1998). Governance structure is here defined as "a control mechanism which has the objective of bringing about the perception of fairness or equity among transactors" (Dyer, 1997, p.537). In the TCE perspective, there are three "generic" governance structure alternatives, which differentiate in their relative efficiency. First, market governance (through classical contracts) is a (relatively) more efficient means of governance for simple transactions when asset specificity is low. On the contrary, second, hierarchical governance (through organization fiat) is (relatively) more efficient when asset specificity and/or uncertainty is high. Finally, hybrid governance (through neoclassical contracts) is viewed as (relatively) more efficient when asset specificity is semi-specific and uncertainty is low. In addition to neoclassical contracts, there are alternative means of safeguarding hybrid/network transactions (i.e. trust or confidence in the goodwill of others, reputation, and financial hostages). The cost-effective choice of governance form varies systematically with the attributes (primarily asset specificity and uncertainty) of transactions (Dyer, 1996, 1997; Whipple, Frankel & Amselmi,1999).

Figure 5 shows the governance structure of supply chain to move from market exchange (or market) to hybrid-integrative (or hybrid) to vertical integration (or hierarchy).

Figure 5

Supply Chain Governance Structure (Whipple, Frankel & Amselmi, 1999)



Furthermore, these governance structures in the supply chain are applied to the phenomenon on a global scale. The value chain refers to "the full range of activities that firms and workers do

to bring a product from its conception to its end use and beyond.” The activities in value chains are as follows: design, production, marketing, distribution and support to the final consumer. Global value chain means that value chains are “divided among multiple firms and spread across wide swaths of geographic space ”(Global Value Chains, 2006).

Gereffi, Humphrey and Sturgeon (2005) identify three variables that play a large role in determining how global value chains are governed and change - (1) the complexity of transactions, (2) the ability to codify transactions, and (3) the capabilities in the supply-base. First, the complexity of transactions means “the complexity of information and knowledge transfer required to sustain a particular transaction, particularly with respect to product and process specifications” Second, the ability to codify transactions means “the extent to which this information and knowledge can be codified and, therefore, transmitted efficiently and without transaction-specific investment between the parties to the transaction”. Third, the capabilities in the supply base means “the capabilities of actual and potential suppliers in relation to the requirements of the transaction” (Gereffi, Humphrey & Sturgeon, 2005; p.85).

Exploring the extent of these three variables (i.e. representatively explicit coordination and power asymmetry), they generate five types of global value chain governance - hierarchy, captive, relational, modular and market. These types of global value chain governance are extensions of three governance structures such as market, network (or hybrid) and hierarchy. Specifically, network (or hybrid) governance is extended into captive, relational and modular governances. They explain five global value chain governances as follows; (1) Markets. “Market linkages do not have to be completely transitory, as is typical of spot markets; they can persist over time, with repeat transactions. The essential point is that the costs of switching to new partners are low for both parties”. (2) Modular value chains. “Typically, suppliers in modular

value chains make products to a customer’s specifications, which may be more or less detailed. However, when providing ‘turn-key services’ suppliers take full responsibility for competencies surrounding process technology, use generic machinery that limits transaction-specific investments, and make capital outlays for components and materials on behalf of customers” (3) Relational value chains. “These networks show complex interactions between buyers and sellers, which often creates mutual dependence and high levels of asset specificity. This may be managed through reputation, or family and ethnic ties. The role of spatial proximity in supporting relational value chain linkages has been highlighted, but trust and reputation might well function in spatially dispersed networks where relationships are built-up over time or are based on dispersed family and social groups”. (4) Captive value chains. “In these networks, small suppliers are transactionally dependent on much larger buyers. Suppliers face significant switching costs and are, therefore, ‘captive’. Such networks are frequently characterized by a high degree of monitoring and control by lead firms.” (5) Hierarchy. “ This governance form is characterized by vertical integration. The dominant form of governance is managerial control, flowing from managers to subordinates, or from headquarters to subsidiaries and affiliates” (Gereffi, Humphrey & Sturgeon, 2005, p.86-87). They also suggest the determinants or characteristics of global value chain governance (Table 1).

Table 1  
Key Determinants of Global Value Chain Governance  
(Gereffi, Humphrey & Sturgeon, 2005)

Governance Type	Complexity of transactions	Ability to codify transactions	Capabilities in the supplier-base	Degree of explicit coordination and power asymmetry
Market	Low	High	High	Low
Modular	High	High	High	↑
Relational	High	Low	High	↓
Captive	High	High	Low	High
Hierarchy	High	Low	Low	

## **Local Embeddedness**

Economic sociologists have developed the concept of embeddedness to challenge the seriously undersocialized concept of the 'economic' held by traditional forms of economic activity (Granovetter, 1985). Embeddedness refers to the fact that economic development is influenced "by actors' dyadic relations and by the structure of overall network of relations" (Grabher 1993, p.4). Furthermore, the local embeddedness of MNCs refers to "the network of relationships between MNCs and their competitors, customers, suppliers, regional business, and public organizations in the geographical areas in which they operate and particularly the extent to which local business is integrated into an MNC's network" (Yeung & Li, 2000, p.624).

Recently economic geographers and others have tried to spatialize the embeddedness concept. The spatialization of embeddedness concept creates further interest in the relationships between firms and territories in which they are located (Dicken & Malmberg, 2001). The notion of embeddedness has also been related to the growing emphasis on knowledge and innovation. Knowledge and innovation are key drivers of development through the concept of the 'learning region.' The 'learning region' is related to the need for regions to develop collective resources that promote informal cooperation, reflexivity and trust (Cooke & Morgan, 1998; Storper, 1997)

The combined influence of corporate reorganization processes and institutional initiatives to support and upgrade plants reflect recent interest in MNC embeddedness. Trends towards organizational decentralization and 'flattening' of corporate hierarchies increases the autonomy and responsibility of plant management. This increase offers opportunities for embedding MNC subsidiaries (Young, Hood & Peters, 1994). In this context, local managers of MNC subsidiaries may be in a position for various works; introducing new ideas, techniques and products to the wider corporations, and developing new relationships with local suppliers, research institutes and



regional agencies (Phelps, Mackinnon, Stone & Bradford, 2003). Phelps, Mackinnon, Stone and Bradford (2003) operationalize local embeddedness as (1) corporate status and functions (2) research, development and design activity (3) the supply chain and local purchases (4) skill and training demands (5) repeat investments.

In addition, the subsidiary sustains and develops its competence in the local setting by interacting with domestic firms, sharing knowledge and learning from its local environment (Yamin & Otto, 2004). As subsidiaries learn from local partners in the host economy (external technological embeddedness), they interact more with local partners (i.e. through vertical linkages). So, the extent and intensity of vertical linkages with domestic firms are positively associated with external technological embeddedness by the foreign subsidiary (Jindra, Giroud & Scott-Kennel, 2008)

### **Maquiladora Industry - Entrepreneurship and Capability Building in Maquila Plants**

A maquiladora is a factory or assembly plant operated in Mexico. Preferential tariff programs established in 1965 by the U.S. and Mexican governments are the base. It is to encourage the development of industry in both countries. Mexico allows materials to be used in maquilas to enter duty-free. The finished product is instantly exported out of Mexico. The U.S. consequently charges these products a much lower tariff than products from other countries (Aly & Schloss, 2003; Brannon, James & Lucker, 1994; Dowlatshahi & Urias, 2004; Fawcett, 1993; Carrillo & Lara, 2005; Kopinak, 2003; Stank & Lackey, 1997; Dutrenit & Vera-Cruz, 2005a).

The maquiladora industry belongs to this specific export program. The number of plants is 2,811 and the number of employees was 1.14 million in October 2004. The industry is structured around 39 economic activities (from simple goods to high technology products). MNCs drive the process. 73% of maquiladora plants make electronics, auto parts and apparel Also 60% of

maquila employment is concentrated on these sectors (Carrillo & Lara, 2005). Specifically, entrepreneurial activities and capability building in maquiladoras are suggested through primary academic literatures.

### **Carrillo's Study**

Carrillo's studies suggest the evolution of maquiladoras through four generations. The first stage (1965–1981) is called the “assembly stage” and is characterized as “productive disintegration and intensification of manual work”. The second stage (1982–1993) is called the “manufacturing stage” and is characterized as “industrial modernization, productive specialization, and rationalization of work”. The third stage (1994–2001) is called the “design stage” and is characterized as “development of technical centers and knowledge intensive work”. The fourth stage is called “coordination from Mexico”. Specifically, for the third stage, industrial clusters were developed through inter-company integration. Local suppliers were also developed. For the fourth stage, the central axis of the new generation of maquilas is the coordination of manufacturing, research, purchasing and services. Supply chain management and local governance have an important role for the coordination (Carrillo, 2004; Carrillo & Hualde, 1998; Carrillo & Lara, 2005).

Four generations means an ideal type of company which has common characteristics and has prevailed during a specific period. Mixed diversity is a primary feature. In other words, different generations of companies co-exist in the same period. The concept of generations cannot be understood in terms of the monolithic or static state that substituted one generation for another. In contrast, although different generations co-exist in the same period, one generation is prevalent. The dominance comes not from the quantitative aspect (for example, the number of

plants) but from governance and driver of value chain. Therefore generation can be understood as capabilities development in a learning environment (Carrillo & Lara, 2005).

### **Sargent and Matthews's Study**

Sargent and Matthews's studies investigate maquila contraction (especially, Chinese EPZ's emergence) and maquila strategy. The maquiladora contraction resulted primarily from six factors; (1) the 2001 recession in the United States (2) The appreciation of the Mexican peso and Mexican wage rates (3) Changes in the way maquiladoras are taxed (4) The implementation of NAFTA Article 303 (5) Changes in the trade regime applicable to U.S. apparel imports and (6) The growth of China's export economy. This changing business environment forced maquilas to develop a new business model, especially mixing moderately priced labor with higher value added production (Sargent & Matthews, 2004).

Reacting to this contraction, maquilas actually implement various strategies. "From a 50 plant sample in the Reynosa region, three primary maquila strategies are classified. The first category is maquilas competing in global markets. In this market, maquiladoras directly compete with producers located in China or other lower cost countries in the United States. These maquilas tend to compete on the basis of price and produce highly standardized, commodity type products. Low, medium, and high-tech firms in this category are struggling. The second category is maquilas competing in mixed global/regional markets. In this market, maquilas have granted the production of high volume, standardized, low-cost goods sold in North America to producers in lower cost countries. Dual sourcing or mass customization strategies are primary strategies to compete successfully in non-standardized segments. Corporate shelters or internal contract manufacturers are used as organizational forms, especially consistent with a high mix, low volume strategy (i.e. production of many products in low volume). The third category is

maquilas competing in regional markets. In this market, maquilas do not directly compete with producers located in lower cost countries in the United States. Just-in-time producers, zero defect producers, low value to weight producers, or as remanufacturing centers are qualified for these firms' characteristics" (Sargent & Matthews, 2008, p. 545).

Chinese competition is commonly recognized to force maquiladoras to exit low-tech, labor intensive industries and evolve toward higher value added, technology intensive sectors. From the information through top management interviews and plant tours at 36 startups in primarily industrial regions such as Reynosa, Guadalajara, and Monterrey, Sargent and Matthews (2008) show that sample firms have consistently pursued proximity dependent strategies rather than high tech strategies. Also, the capital intensity, technology intensity, and skill development activities of proximity dependent maquiladoras vary from low to very high.

In addition, entrepreneurship in maquila plants (especially, subsidiary evolution) is investigated. From a sample of 50 maquiladoras in the Reynosa region, Sargent and Matthews (2006) investigate that subsidiary initiative is related to industrial upgrading. The study shows that the increased responsibilities within MNC networks are obtained through the entrepreneurial efforts of subsidiary managers rather than given by the parent company. Also, from interviews at 40 maquilas in the Reynosa region, Sargent (2003) show that the most attractive maquila segments can successfully change into a higher value added model. That is, maquila auto-part suppliers could renew and at times even extend their charter. However, in other major maquila segments, charter erosion and/or charter loss is widespread.

### **Dutrenit and Vera-Cruz's Study**

Dutrenit and Vera-Cruz (2005b, 2007) investigate three cases of subsidiaries of MNCs in Mexico that operate under the maquila regime. They show the technological capability building

process of maquila plants. That is, subsidiaries of MNCs oriented towards assembling activities in developing countries steadily build up technological capabilities. A deliberate strategy to build up decentralized capabilities may not cause the accumulation of capabilities. However, this result is an outcome of the learning processes at the plant level. This accumulation creates pressure on the headquarters to admit the achievements. As a result, the headquarters allow plants to carry out activities of higher innovativeness. There are two triggers of the local accumulation process. The first trigger is the introduction of new and more complex products or business lines. The second trigger is the change or execution of new technical activities. These triggers serve to accelerate the accumulation.

### **Research Model and Research Propositions**

#### **Subsidiary's Active Role for Knowledge Spillovers**

With the survey evidence from 424 foreign subsidiaries based in transition economies, Jindura, Giroud and Scott-Kenel (2008) researched the influence of subsidiaries' autonomy, initiative, technological capability, internal and external technological embeddedness on the extent and intensity of forward and backward vertical linkages. The evidence supports the argument that the potential of technology diffusion via vertical linkages relies on the nature of subsidiary roles. Subsidiary roles and technological competences influence the extent of vertical linkages as well as their potential for technological spillovers (Jindura, Giroud & Scott-Kenel, 2008).

Specifically, a subsidiary can also be recognized as a semiautonomous unit that exercises entrepreneurial or independent initiative. A subsidiary advances the internal market efficiency of the MNC. External or market oriented initiatives try to discover new customer needs, develop new suppliers or build new alliance relationships. Internal initiatives try to make the existing set

of relationships within the MNC network more efficient. These initiatives can change the value-adding scope of the subsidiary or switch from an internal to an outside supplier (Birkinshaw, 1998). So, according to their research, the foreign subsidiary initiative is positively related to the extent and intensity of vertical linkages with domestic firms (Jindura, Giroud & Scott-Kenel, 2008).

Matin and Bell (2006) explore empirically the effects of subsidiary's activities on technology spillovers from FDI using data for industrial firms in Argentina from 1992-1996. Significant results can be obtained when subsidiaries' own technological activities are used as an explanatory variable of the spillover process. In the traditional pipeline model, technology spillovers from FDI recognize the MNC subsidiary as a passive actor. However, a different model is suggested. A substantial part of the potential for spillover is created within local subsidiaries because of their own knowledge-creating and accumulating activities in the host economy (Cantwell & Mudambi, 2000; Giroud & Mirza, 2006; Matin & Bell, 2006).

### **Entrepreneurship and Learning in Supply Chain**

The relationship between MNC subsidiaries and local suppliers is a kind of network and supply chain, especially composed of buyers and suppliers. Recently, for many firms, using their supply chains as competitive weapons has been recognized as a central element of the strategic management process.

Hult, Ketchen and Arrfelt (2007) examined the influence of a culture of competitiveness and knowledge development on supply chain performance in varied market turbulence conditions with a sample of 201 firms. As a result, synergies existed between a culture of competitiveness and knowledge development. Their interaction has had a positive relationship with performance.

Cultural orientations are composed of three distinct sets - entrepreneurial, innovative, and learning (Hult, Ketchen & Arrfelt, 2007). These factors enable supply chains to fill gaps strategically between customers' future desires and what is currently offered. Three orientations are related to supply chain members' – buyers and suppliers – values. Entrepreneurial orientation is associated with the pursuit of new market opportunities and the renewal of existing areas of supply chain activities (Naman & Sleven, 1993). An innovativeness orientation is associated with new idea generation (i.e. openness to new ideas) (Hurley & Hult, 1998). A learning orientation is associated with the generation of new insights that have the potential to shape supply chain activities (Huber, 1991).

Strategic supply chains contribute as a potential source of competitive advantage for firms. The ability of a strategic supply chain to produce cultural competitiveness or joint entrepreneurship and learning aimed to fill market gaps is a key path for a competitive advantage (Ireland & Webb, 2006). In this aspect, entrepreneurship and learning in a supply chain jointly create a competitive advantage.

### **Learning Local Markets and Institutional Relationships from Local Partners - Reverse Knowledge Spillovers**

Emerging markets offer attractive opportunities for developed market firms. In detail, there are growth opportunities to expand the sales revenues in most emerging markets. Also, the emerging market countries often have the potential for economic growth (i.e. wealth increase in their population) (Hitt, Hoskisson & Kim, 1997; Hoskisson, Eden, Lau & Wright, 2000; Li & Atuahene-Gima, 2002). Specifically, foreign firms from developed countries enter emerging markets primarily because of resource seeking and opportunity exploring purposes. However, in emerging markets, formal institutional constraints exist (e.g. inefficient legal frameworks and

weak intellectual property rights). Foreign entrants are difficult to adapt to the emerging market country's institutional environment because of these constraints. Though the foreign entrants have superior resources and capabilities, they still need to learn about local markets, especially institutional arrangements and social connections (Hitt, Li & Worthington, 2005; Steensma & Lyles, 2000; Tsang, 2002).

Local market partners understand the culture of the local market. Also local market partners know how the culture relates to the customers and others with whom the foreign entrants must interact. Local partners understand how the distribution networks operate. Also, local partners have connections with important government entities (Zahra, Ireland, Gutierrez & Hitt, 2000). Foreign entrants must learn the culture and the informal institutions in local markets particularly from their local partners. Foreign entrants need to learn to build social capital in the local market. Finally, foreign entrants primarily seek to learn about the local markets and institutional relationships from their local partners (Hitt, Li & Worthington, 2005). This phenomenon is recognized as reverse knowledge spillovers (Feinberg & Gupta, 2004).

In addition, international strategies of foreign entrants are usually based on their valuable resources. That is, foreign entrants may be more successful in the new markets entered when they exploit their core skills for the purpose (Pennings, Barkema & Douma, 1994; Chang & Rosenzweig, 2001). Therefore, foreign market entrants try to utilize their superior resources in the emerging markets. However, diffusion of knowledge within multinational firms is difficult and often incomplete (Monteiro, Arvidsson & Birkinshaw, 2004). The reason is partly due to idiosyncratic characteristics of each market and country. These distinct characteristics include the following factors; unique distribution processes and customer needs, and distinct cultural values and institutions. Thus, the foreign firm must learn how to exploit its superior knowledge



in distinctly different market contexts through cooperation with their local partners (Hitt, Li & Worthington, 2005).

### **Continuous Innovation through Collaboration in Supply Chain – Collaborative Entrepreneurship**

As the extent of global competitiveness increases, the demands in supply chain (i.e. cost reduction, high quality, improved customer service and continuity of supply) also increase. That is, organizations in supply chain need continuously to increase their effectiveness and satisfy customers. So, firms look beyond their organizational boundaries and assess how the resources and capabilities of suppliers and customers can be utilized to create the value (Soosay, Hyland & Ferrer, 2008).

There are several reasons that support why co-operative buyer-seller relationships are strategically more important in today's industrial marketplace (Håkansson, 1987). First, the product frequently follows quite complex chains of production. Second, customers often have specific requirements that need the strong commitment of a specific supplier. Third, modern technical exchange has the characteristic of two-way. Buyers and suppliers who interact frequently can learn from each other, if not more than they ever could, by keeping all of their actions internal. Finally, an interactive relationship strengthens each organization spanning its boundaries to "learn to learn more" (Cohen & Levinthal, 1990). The organization also increases its capacity to learn from its interaction with other firms and other organizations (e.g. research and regulatory institutions), and with the larger industrial and marketing networks in which it participates (Fynes & Ainamo, 1998)

Specifically, supplier collaboration is positively related to buyer performance. Suppliers may promote firm innovation by performing R&D of its own and absorbing some of the R&D costs

incurred in the buying firm. Moreover, suppliers often have valuable knowledge of production that affects a firm's performance. Finally, suppliers can transfer valuable ideas such as improvement for products to buying firms. Supplier collaboration promotes the sharing of tacit and explicit knowledge and strengthens knowledge creation and innovation spillovers from the supplier (Soosay, Hyland & Ferrer, 2008).

Firms pursue superior performance by seeking opportunity and advantage simultaneously. These activities are strategic entrepreneurship. Both small and large firms can pursue strategic entrepreneurship. However, small and large firms may confront different impediments. Small firms have strong opportunity-seeking skills. However, small firms have the limited knowledge stocks and market power. These limitations hinder their ability to create values from opportunities that the firms choose to pursue. On the contrary, large firms have skills to establish competitive advantages. However, large firms emphasize with the efficiency of their existing businesses. This characteristic often undermines their ability to explore continuously for additional opportunities (Ketchen, Ireland & Snow, 2007).

Firms pursue innovations across firm boundaries by sharing ideas, knowledge, expertise, and opportunities. These activities are collaborative innovation. Collaborative innovation enables small and large firms to overcome their respective challenges. These collaborative and innovative activities refer to collaborative entrepreneurship. Collaborative entrepreneurship creates something of economic value, which is based on new, jointly created ideas that originate from the sharing of information and knowledge.

That is, pursuing entrepreneurship collaboratively provides benefits to both small firms and large firms. Small firms can preserve their creativity and flexibility while diminishing the inherent liabilities of smallness. Also, large firms can utilize their advantage-creating skills while

simultaneously exploring for opportunities outside their current business domain. Finally, small and large firms can create wealth by learning how by integrating strategic entrepreneurship and collaborative innovation (Ketchen, Ireland & Snow, 2007; Miles, Miles & Snow, 2006).

Learning is best conceived as a process, not in terms of outcomes. Learning is a continuous process grounded in experience. Learning is also a cycling process (Kolb, 1984; Argyris & Schon, 1974 ; Lewin, 1948). In addition, for the strategic characteristics of the supply chain, the strategic management process - developing strategic vision, setting objectives, designing a strategy, implementing the strategy, and evaluating performance- is an ongoing, never-ending process and not a start-stop event. That is, firms continue to detect when new developments require a strategic response. Therefore, the task of evaluating performance and starting corrective adjustments is both the end and the beginning of the strategic management cycle (Thompson & Strickland, 2003).

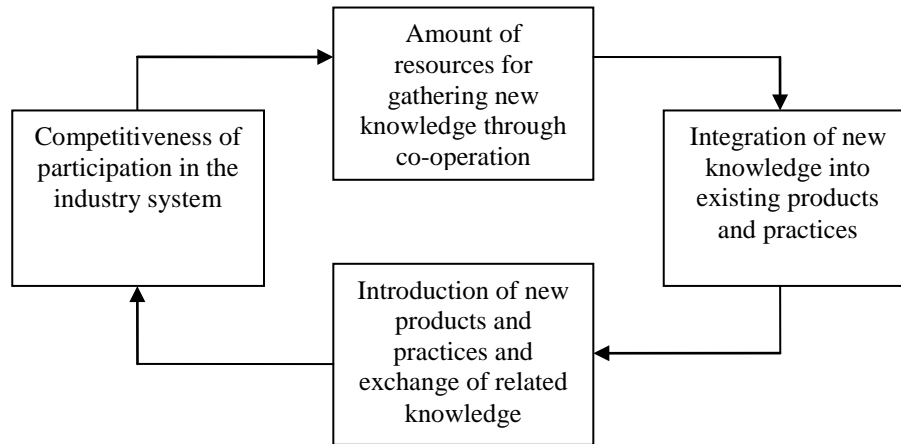
Specifically in the case study of the buyer-supplier relationships between the Irish subsidiary Apple Computer and two of its local suppliers, Fynes and Ainamo (1998) show how and why the multinational firms and their local suppliers interact and obtain knowledge from each other. They show the continuous learning process in lean supply arrangement between a multinational buyer and its local suppliers (Figure 6).

### **Governance Structure and Local Embeddedness as Source of Social Divide**

Hierarchical coordinating mechanisms coupled with a lack of embeddedness in the region potentially results in social divides. Social divides increase inequality. Inequality is an important indicator of regional development in Latin American countries, the most inequitable in the world. This increases growth but hinders economic, socio-institutional, and human development.

Figure 6

The Cycle of Organizational Learning in an Effective Relationship  
(Fynes & Ainamo, 1998)



It is because they negatively affect the formation of capabilities and the formation of a stronger socio-economic and institutional organization (Rocha, 2004). In addition, with the survey evidence from 424 foreign subsidiaries based on transition economies, Jindura, Giroud and Scott-Kenel (2008) show that external technological embeddedness by the foreign subsidiary is positively associated with the extent and intensity of vertical linkages with domestic firms. In this context, hierarchical governance structure between local suppliers and MNC, and low local embeddedness of MNC can be expected to have a negative effect on the learning process of local suppliers.

From the above statements and literatures in the previous sections, the following research model (Figure 7) and research propositions are suggested.

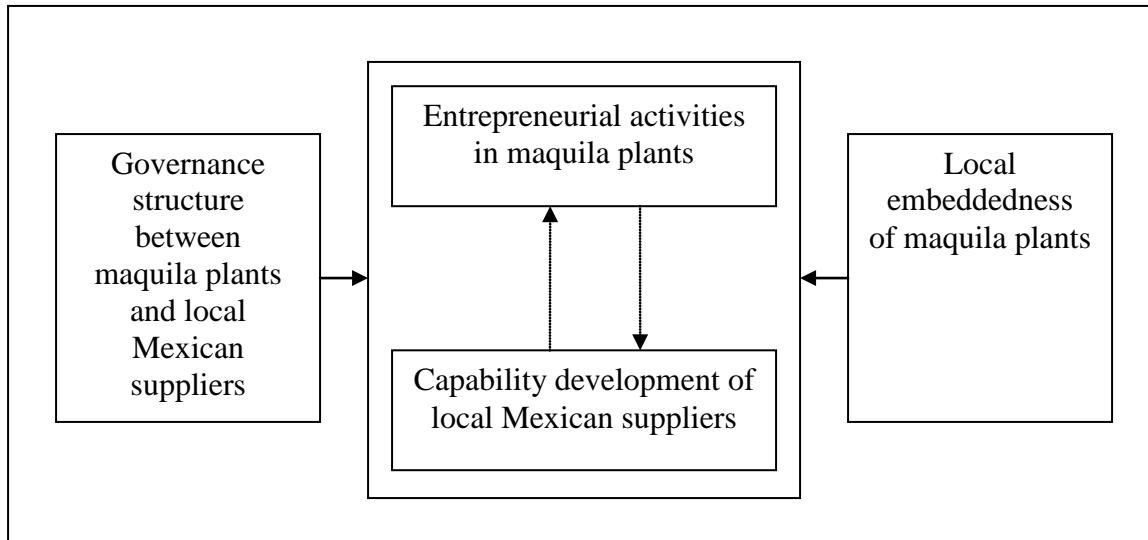
Research propositions

Proposition 1 Entrepreneurial activities in maquila plants have a positive effect on the capability development of local Mexican suppliers

Proposition 2 Capability development of local Mexican suppliers has a positive effect on entrepreneurial activities in maquila plants

Figure 7

Research Model



Proposition 3 Governance structure between maquila plants and local Mexican suppliers and local embeddedness of maquila plants moderate the relationship among entrepreneurial activities in maquila plants and capability development of local Mexican suppliers

-Proposition 3-1 Hierarchical governance structure between maquila plants and local Mexican suppliers coupled with low local embeddedness of maquila plants has a negative effect on the relationship among entrepreneurial activities in maquila plants and capability development of local Mexican suppliers

## CHAPTER III

### RESEARCH METHOD

#### **Sample**

##### **Reynosa City**

Reynosa city is an interesting location in which to conduct a study on recent maquiladora dynamics. While little research has examined the operation of EPZ firms along this region of the U.S.-Mexico border, in December, 2006, the number of Reynosa maquila workers (96,105) was ranked third behind Cd.Juarez (236, 293) and Tijuana (164,880) as the Mexican city with the largest number of maquila employees (Maquila on-line directory, 2008). In the maquila contraction - the October 2000 to August 2002 period, compared to the other maquila regions, there was no significant drop in employment in Reynosa. Reynosa maquilas are well diversified in various industries that include electronics and automotive as primary industries. The country of origin of Reynosa maquilas is also various such as U.S., Europe and Asia (Sargent & Matthews, 2004).

Reynosa is now one of the fastest growing cities in the global economic scene. Experts and the media have labeled it one of the ten best places to invest in Mexico. At the same time, important organizations like the World Bank have named Reynosa one of the sixteen best cities for international business. The manufacturing industry is the largest primary sector (i.e., by sales volume). The rest is divided among the commercial sector and financial services. Important

countries doing business in Reynosa are the United States, Canada, Spain, Holland, Germany, Korea, France, China, and the Virgin Islands (Mexico Industrial Maps 2007).

Reynosa has a leading role to create jobs in Tamaulipas because a third of the economic activity in Tamaulipas occurs here. In the year 2006, 21,969 new jobs were created. This number is a 6.56% increase compared to the previous year. Also, 72% of the total population is the economically active population. The export maquiladora sector is the principal economic activity in Reynosa. This sector represents almost 50% of all economic activity. The commercial sector takes second place because of retail chains, shopping centers, restaurants, and entertainment centers (Mexico Industrial Maps, 2007). In Reynosa, there are ten industrial parks and three more in progress. Currently, two ambitious projects will increase economic and commercial development in the U.S.-Mexico border zone and convert this area into a strategic space for communication and the transportation of goods. The projects include a new logistics route, Asia-Pacific, Multimodal Terminal, Interstate 69, and Reynosa-Mission International Bridge (Mexico Industrial Maps 2007). In these aspects, Reynosa city can be considered more innovative and entrepreneurial.

### **Supplier Development Program in Reynosa**

In order to optimize quality, volume, and price, the Mexican state identifies, evaluates, and supports the development of suppliers. These programs are to assist the local industrial sector and as a result meet the international quality standards and requirements of the leading foreign industry. Furthermore, the purpose is the identification, approach and integration of the supply chain for foreign and national companies, allowing the increase of direct and indirect local exports by SMEs (Twin Plant News, 2005).

Three programs primarily comprise the supplier development program in Reynosa. The programs are as follows: Reynosa Asociación de Maquiladoras y Manufactureras, A.C. (RAMMAC)'s supplier development program (supplier database), electric-electronics cluster program and government support program.

**RAMMAC supplier development program (supplier database program).** RAMMAC has created and managed a database to connect maquila plants and local Mexican suppliers. The mission is to provide support to the maquiladora industry in the supply chain improvement process, integrating local Mexican suppliers and generating new growth opportunities for the community. The vision is to become the best option for the maquiladora industry in supplier development for productive, indirect material and services (RAMMAC, 2008).

Industry benefits are the following: (1) supply chain logistics optimization for parts and services, (2) plant inventory reduction by applying just in time (JIT) concept, (3) higher flexibility to changes, (4) access to more competitive prices. The primary service is potential supplier identification based on company requirements. The primary service coordinates supplier and customer business meetings oriented to a specific industrial sector or commodity (RAMMAC, 2008).

As a part of RAMMAC membership, local Mexican suppliers can search commodities for processes, including indirect material and different maquiladora services. If buyers want a part of supplier directory, buyers can search and validate the providers who fulfill the necessities of the maquiladora industries at Reynosa and Rio Bravo, Tamaulipas. RAMMAC acts as a business encounter- supplier validation, business between maquiladoras and suppliers (RAMMAC, 2008). As of 2008, the RAMMAC local supplier database includes 110 local suppliers.



A RAMMAC specialist in supplier development explains that there are some benefits to join the supplier database program for maquila plants and local Mexican suppliers. For maquila plants, the benefits are the following: connection (or familiarity) to government, commitment to society, low logistics cost and emergent materials or back-up supply. For local Mexican suppliers, the benefits are the following: promotion or merchandising, receiving consulting, etc.

**Electric-electronics cluster program of Reynosa.** Following the purpose of the supplier development, in Reynosa, a cluster program is implemented in the composition of primary sectors such as maquila plant, local government, local university, coordinating organization (i.e. RAMMAC) and local Mexican supplier.

The cluster is defined as “a geographically proximate group of firms and associated institutions in related industries, linked by economic and social interdependencies” (Rocha, 2006, p.119). The cluster is also a production network of highly interdependent businesses. It specializes the supplier’s link in a value-adding chain. The cluster’s goal is to find alternatives to make the maquiladora industry of the region competitive.

Reynosa is the city that has the greatest number of companies in the electric-electronic sector in Tamaulipas. The development of clusters means that Tamaulipas becomes to be an industrial area with specialized activities and services for the electric and electronic sector. As a result, Tamaulipas attracts investment and at the same time creates jobs for the sector. There are 54 firms dedicated to the electric-electronic sector in Reynosa. These firms have created about 48,790 jobs in a total floor area of 6,773,773 square feet. The electric-electronics cluster of Reynosa, Tamaulipas is the first created cluster in Tamaulipas. This cluster program started about ten years ago (one local university interviewee who participates in cluster program, personal communication, Aug, 2009). The cluster program is conceived as part of the proactive

state government policy of the department of economic development and employment (Maquila Reynosa, 2009).

Currently ten maquila plants, two government organizations, three universities, and one coordinating organization (RAMMAC) are members of electric and electronics cluster program. Local Mexican suppliers join various events of this cluster program.

**Government support program.** The Mexican government implements the support program for local Mexican suppliers. Because of recession, local Mexican suppliers, especially small suppliers do not have enough credits. It is not easy for them to get support from banks. They may go bankrupt because maquilas delay payments to them. At the same time, they need to pay the salary to employees or to related companies (i.e. to continue to run the business). For these difficulties, Mexican government's support programs are implemented. First, when a maquila delays the payment to local Mexican suppliers, especially during recession, local Mexican suppliers can first receive the payment from the government; later, a maquila can pay the government. This program is called "Nacional Financiera." It is a kind of development banking institution (Nacional Financiera, 2008). Second, local Mexican suppliers can get funds from the government to improve or start their small business. For the start of the business, the government supports new business in Reynosa and gives the information about new facilities, maquiladoras and supplier databases. The primary qualification for the benefits of these programs is to be ready to register or to be registered in the government tax department and keep tax requirements (One local government interviewee, personal communication, Aug, 2009).

In conclusion, the supplier development program in Reynosa means primarily the electric-electronics cluster program. For this cluster program, maquila plants, local government, local universities and RAMMAC are members. Local Mexican suppliers join events or programs of

the cluster program. Specifically, RAMMAC implements the supplier database program. Also, local governments give various support programs (especially in finance) to local Mexican suppliers. Therefore, supplier development programs in Reynosa can totally be thought of as electric-electronics cluster program, RAMMAC supplier database program and government support program for local Mexican suppliers.

With this characteristic of a supplier development program in Reynosa, sample organizations in this research are (1) members of an electric-electronics cluster program - maquila plants, local government, local university and RAMMAC - and (2) local Mexican suppliers included in RAMMAC supplier database.

### **Sample of Local Mexican Suppliers**

Maquila suppliers have traditionally been defined as Mexican owned companies that are providing something other than simply acting as distributors for U.S. firms (Brannon & Lucker, 1994; Carrillo, 2004 ; Fawcett, 1993; Dutrenit & Vera-Cruz, 2005a). Therefore, 110 suppliers in the RAMMAC supplier database were classified with three dimensions: (1) supplier group/service category in the maquila online directory 2008 (2) local ownership; (3) manufacturing (or engineering) process. Internet information (e.g. internet websites of supplier company and private call contact) was used for the classification (Figure 8).

Additionally, local ownership means domestic suppliers. There are foreign suppliers that enter in locally and provide the materials to maquila plants. These foreign suppliers are not included in the sample. On the other hand, on the U.S. side of the border, there are suppliers that do business with maquilas, but the owner is a U.S. citizen. These suppliers are domestic suppliers and are included in the sample. That is, in this research, local Mexican suppliers mean local domestic suppliers exactly. Overall, for the research region, Mexicans dominate

demographically. Therefore, local domestic suppliers are named as local Mexican suppliers. In the interview process, all supplier interviewees understood this concept and answered the questions. This research extends the traditional maquila suppliers' concept from the research purpose (relationship between MNCs and domestic firms) and research results.

Figure 8

Classification of 110 Suppliers in RAMMAC Supplier Database

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Local ownership (44)

- *Manufacturing (or engineering) process* (23)

*Primary and Fabricated Steel Products* (5)

*Chemicals* (2)

*Environmental* (4)

*Primary and Fabricated Steel Products / Plastics and Rubber Products* (3)

*Plastics and Rubber Products* (2)

*Electrical Equipment, Appliances and Components* (1)

*Construction* (1)

*Apparel, Textiles and Leather* (1)

*Warehousing* (1)

*Furniture and Related Products / Warehousing* (1)

*Packaging* (1)

*Printing and related support activities* (1)

- *Non-manufacturing process* (21)

Non-Local ownership (66)

Multinational firm (51)

US owned firm (15)

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In the classification, many multinational firms and Mexican distributors exist as suppliers in the RAMMAC supplier database. Twenty three suppliers that have local ownership and manufacturing (or engineering) processes are the target sample of local Mexican suppliers. These local Mexican suppliers show various sub-categories. Three local Mexican suppliers who are located far from Reynosa (e.g. Mexico City 1, Chihuahua 2) are excluded. One local Mexican supplier could not be found because of bankruptcy or moving. One local Mexican supplier was closed. For the remaining eighteen suppliers, sixteen suppliers agreed to be interviewed. One of the sixteen local Mexican suppliers was recently acquired by a foreign

multinational automotive parts manufacturing company. However, this supplier company manufactures and provides the components to the maquila plant. The interviewee is a Mexican purchasing manager and understands local Mexican suppliers very well. This company is the only supplier sample in the Nuevo Laredo region. So, this interview was not excluded in the analysis.

Finally, 16 local Mexican suppliers were interviewed and analyzed. They are located in Texas (McAllen, Brownsville), Tamaulipas (Reynosa, Matamoros, Nuevo Laredo) and Nuevo Leon (Monterrey). Interviewees were CEOs (3), a director of advanced purchasing (1), plant managers (2), general managers (3), an office manager (1), purchasing managers (2), a quality manager (1), and a sales manager (1) etc. Thus, interviewees were overall CEOs or managers. They dealt with maquilas or knew the relationship with maquilas well.

The sample local Mexican suppliers provide their products or services to various industries. Automotive and electronics are primary industries. Their business categories are also various. Steel, plastics and environmental categories are relatively more frequent. The regions are various around the eastern U.S.-Mexico border area, although industrial cities in Mexico, Reynosa and Monterrey are more frequent. The most frequent years of establishment are 1990 and 2000. The remaining year periods are equally distributed. For the size or number of employees, the most frequent amounts are below 50 and 100 to 150. Therefore, local small and medium sized firms are the most frequent. However, other types of firms (i.e. the branch of Mexican company or the branch of Mexican multinational company and the branch of Mexican company acquired by foreign multinational company) also exist. This shows variety (various types) of local Mexican suppliers. As the related issue, Mexican owners are the most frequent as the nationality of owner but the foreign nationality (especially U.S.) exists. For customers, maquila plants are absolutely

primary customers. Sample local Mexican suppliers who do not have any maquila customers do not exist. Although there is not much information, for the competitors of local Mexican suppliers, Mexican competitors are the most frequent, especially suppliers in the Monterrey region, and as foreign suppliers, U.S. suppliers are primary competitors. Table 2 and Table 3 show characteristics of sample local Mexican suppliers.

Table 2  
Characteristics of Sample Local Mexican Suppliers 1

<b>Primary industry sector (Highest percentage of sales)</b>	<b>Percentage</b>
Automotive	2 (12.5%)
Electronics	2 (12.5%)
Various industries	12 (75%)
<b>Primary product or services (Highest percentage of sales)</b>	<b>Percentage</b>
Primary and Fabricated Steel Products	3 (18.75%)
Primary and Fabricated Steel Products / Plastics and Rubber Products	3 (18.75%)
Environmental	3 (18.75%)
Plastics and Rubber Products	1 (6.25%)
Electrical Equipment, Appliances and Components	1 (6.25%)
Chemicals	1 (6.25%)
Construction	1 (6.25%)
Apparel, Textiles and Leather	1 (6.25%)
Warehousing	1 (6.25%)
Printing and related support activities	1 (6.25%)
<b>Location</b>	<b>Percentage</b>
McAllen	1 (6.6%)
Brownsville	1 (6.6%)
Reynosa	5 (31.25%)
Monterrey	6 (37.5%)
Matamoros	1 (6.25%)
Nuevo Laredo	1 (6.25%)
<b>Year of establishment</b>	<b>Percentage</b>
Before 1980	3 (18.75%)
1980 – 1990	3 (18.75%)
1990 – 2000	6 (37.5%)
2000 – 2009	4 (25%)
<b>Number of employees</b>	<b>Percentage</b>
Below 50	10 (62.5%)
50 – 100	1 (6.25%)
100 - 150	3 (18.75%)
150 -200	1 (6.25%)
Above 200	1 (6.25%)

Table 3

## Characteristics of Sample Local Mexican Suppliers 2

<b>Nationality of Owner</b>	<b>Percentage</b>
Mexican	11 (68.75%)
Non-Mexican	5 (31.25%)
-US Citizen	3 (18.75%)
-US Citizen and Mexican Citizen (Dual nationality)	1 (6.25%)
-Others	1 (6.25%)
<b>Types of Local Mexican Supplier</b>	<b>Percentage</b>
Local small and medium sized company	10 (62.5%)
One branch of Mexican company (Including Grupo)	2 (12.5%)
One branch of Mexican international company	2 (18.75%)
One branch of Mexican company acquired by foreign multinational company	1 (6.25%)
<b>Types of Customer</b>	<b>Percentage</b>
Only maquila	6 (37.5%)
Maquila (major customer) and others (minor customer)	6 (37.55%)
Maquila (minor customer) and others (major customer)	2 (25%)
No Maquila	0
<b>Types of Competitor</b>	<b>Percentage</b>
Mexican	8 (42.10%)
US	4 (21.05%)
Asia	1 (5.26%)
Other country	1 (5.26%)
No information	5 (26.31%)

**Sample of Maquila Plant**

Ten maquila plants are members of electric-electronics cluster program. Eight member maquila plants agreed to be interviewed. One sample maquila plant is not a member of the cluster program but has the business with one cluster member maquila plant (supplier). The cluster member maquila interviewee introduced the maquila additionally to the author, and the

national origin of the maquila is the same as the author's origin. Finally, nine maquila plants were interviewed. Interviewees were purchasing managers (or supervisors) (3), material managers (2), director of advance purchasing (1), supply chain manager (1), supplier quality manager (1) and program manager (1). Overall, all interviewees dealt with or knew local Mexican suppliers well.

Eight sample maquilas are members of an electric-electronics cluster program and one sample maquila does business with one member maquila (supplier). The primary industries are automotive and electronics. The primary business varies but automotive parts are the more frequent business category. All sample maquila plants are located in Reynosa. Between 1990 and 2000, more sample maquila plants were established. The size (the number of employees) is almost equally distributed, between less than 500 and more than 5,000. Especially less than 500, 1,000 to 2,000 and 2,000 to 3,000 are relatively more frequent. The total average number of employees is 1,987. Maquila plants purchase indirect materials frequently, but they also purchase direct materials from local Mexican suppliers. However, direct materials comprise a smaller percentage from local Mexican suppliers. There is a sample maquila plant to purchase raw materials from local Mexican suppliers. For its business characteristic, the total percentage of the purchase of local Mexican suppliers is case by case in the sample maquila plants ; the extreme cases are less than 1% and over 90%. However, most maquila plants in the sample purchase between 20% to 50% of the total percentage of the purchase from local Mexican suppliers.

In addition, one sample maquila plant that is not the member of electric-electronics cluster is a subsidiary of a small and medium sized multinational company and works in the molding business. The number of employees is small. This maquila started up within five years. Compared to the other sample maquila plants, this maquila plant has different sample



characteristics. However, the maquila plant interviewee deals with and knows local Mexican suppliers well. The interviewee also gave useful information about the transaction with local Mexican suppliers. So, this maquila plant interview was not excluded in the analysis. Table 4 and Table 5 show characteristics of sample maquila plants.

Table 4

Characteristics of Sample Maquila Plants 1

<b>Primary Industrial Sector (Highest Percentage of Sales)</b>	<b>Percentage</b>
Automotive	4 (44.44%)
Electronics	5 (55.55%)
<b>Primary Business (Highest Percentage of Sales)</b>	<b>Percentage</b>
Cell phone	1 (11.11%)
Household audio and video equipment (e.g. television sets)	1 (11.11%)
Domestic vacuums	1 (11.11%)
Automotive part	4 (44.44%)
Consumer product (primary electronics) contract repair manufacturing	1 (11.11%)
Metallic mould/injection molding/mould decoration/coating/painting/assembly	1 (11.11%)
<b>Location</b>	<b>Percentage</b>
Reynosa	9 (100%)
<b>Year of Establishment</b>	<b>Percentage</b>
Before 1990	1 (11.11%)
1990-2000	6 (66.66%)
After 2000	2 (22.22%)
<b>Number of Employees</b>	<b>Percentage</b>
Less than 500	2 (22.22%)
500 – 1000	1 (11.11%)
1000 – 2000	2 (22.22%)
2000 – 3000	2 (22.22%)
3000 – 4000	1 (11.11%)
More than 5000	1 (11.11%)

Table 5  
 Characteristics of Sample Maquila Plants 2

<b>The Purchase from Local Mexican Suppliers</b>	<b>Percentage</b>
Part of product (e.g. molded plastics, metal stampings)	5(41.66%)
Raw material of product (e.g. resin for plastic injection molding)	1 (8.33%)
MRO (Maintenance, Repair and Operations) items (e.g. packaging, pallet wood, tool equipment, construction)	6 (50%)
<b>Percentage of the Purchase from Local Mexican Suppliers</b>	<b>Percentage</b>
Missing	3 (21.42%)
Less than 1%	1 (7.14%)
10% -19%	2 (14.28%)
20%-29%	2 (14.28%)
30%-39%	2 (14.28%)
40%-49%	2 (14.28%)
20%-50%	1 (7.14%)
90%-100%	1 (7.14%)
<b>Change of the Percentage of the Purchase of Local Mexican Suppliers</b>	<b>Percentage</b>
Increase	5 (55.55%)
Decrease	
No information	4 (44.44%)

**Sample of Local Government, Local University and Coordinating Organization**

The local government, local university and coordinating organization (RAMMAC) are members of electric-electronics cluster. These member organizations were interviewed. Table 6 shows sample organizations and interviewees of local government, local university and coordinating organization.

As for local government, two government officers were interviewed. For the government of Tamaulipas, the director of the electric-electronics cluster program of Reynosa, who is the officer in the department of economic development and employment, was interviewed. For the government of Reynosa, the industry director was interviewed. These two local government organizations and interviewees are deeply involved in the electric-electronics cluster program.

Table 6

Sample Organizations and Interviewees of Local Government, Local University and Coordinating Organization

<b>Local Government</b>	<b>Interviewee</b>
Government of Tamaulipas	Director of electric-electronics cluster program of Reynosa, who is an officer in the department of the economic development and employment (SEDEEM, Secretaria de Desarrollo Economico y Del Empleo)
Government of Reynosa	Director of industry
<b>Local University</b>	<b>Interviewee</b>
One technical university (public) in Reynosa	Director de vinculación (Director of partnerships)
One private university located in an maquiladora industrial park in Reynosa	Graduate academic coordinator
<b>Coordinating Organization</b>	<b>Interviewee</b>
Reynosa Asociación de Maquiladoras y Manufactureras, A.C. (RAMMAC)	Director

For the local university, the director of partnerships (director de vinculación, the one responsible for recruitment to the industry) of the public technical university in Reynosa was interviewed. This university is a public, government-financed university. The primary goal of the university is to educate and train students for technical fields, which the industry needs. The main degrees offered include business administration, electronics, automotive, maintenance and industrial processing. Overall, students or graduates have maquiladora internships or jobs.

Also, a graduate academic coordinator of the private local university in Reynosa was interviewed. This university is the first university located in the industrial park of the maquiladoras in Mexico. In other words, the focus of this university is also to provide people who the maquiladora industry needs. The degree program is more various, and the focus is about engineering and business administration.

These universities and the interviewees are deeply involved in the electric-electronics cluster program, especially the education program of people (e.g. technicians) which maquilas need. Finally, for the coordinating organization, the RAMMAC director was interviewed.

Overall, these local governments, local university and RAMMAC interviews were used as supportive data for interviews of maquila plants and local Mexican suppliers. All these organizations and interviewees are deeply related to and do the activities for the electric-electronics cluster program. They know local Mexican suppliers and maquila plants well.

## **Method**

### **Unexamined Areas: Research Voids**

Learning of emerging market firms from foreign entrants has been recognized as being important. However, there is a research void in the literature. First, there is little research on learning behaviors by local emerging market firms. Domestic firms have a strong desire and need to learn new capabilities, especially managerial and technological capabilities. The purpose is to develop their abilities to compete and obtain competitive advantages. However, there is little knowledge about how these firms learn (Hitt, Li & Worthington, 2005).

There are many published literatures on the technological capability accumulation of firms in developing countries and emerging markets. However, the issue about the effects of technological spillovers on these capabilities has rarely been explored (Dutrenit & Vera-Cruz, 2005a).

In this aspect, the learning process of local Mexican suppliers from maquila plants and entrepreneurial activities in maquila plants are underdeveloped research topics.

## **Qualitative and Exploratory Research**

Sometimes the purpose of qualitative research is to gain an understanding of the problem and its underlying factors. Qualitative research is unstructured and exploratory in nature. Popular qualitative techniques are in depth interviews (one-on-one interviews that explore the respondents' thoughts in detail) and pilot surveys with small samples of respondents (Malhotra, 1996 ; Kerlinger & Lee, 2000 ; Pedhazur & Schmelkin, 1991; Zikmund, 2003).

A qualitative research method is appropriate and essential for the following: (1) where either theory does not yet exist or is unlikely to apply; (2) where theory exists but the environmental context is different; (3) where cause and effect are doubtful or involve time lags. A qualitative research method also gives an outstanding vehicle for other research roles such as developing understanding, especially a role that may have particular significance in a field where the subject matter is very complex (Stuart, McCutcheon, Handfield, McLachlin & Samson, 2002)

In addition, one of the primary purposes of exploratory research is to provide insights into an understanding of the problem confronting the researcher. In exploratory research, the researcher must define the problem more precisely, identify relevant courses of action, or gain additional insights before an approach can be advanced. At this stage, the information needed is only loosely defined. The characteristics of the research process that is adapted are flexible and unstructured. Generally, the sample is small and non-representative. The primary data are naturally qualitative and are analyzed. Given these characteristics of the research process, the findings of exploratory research should be recognized as tentative or as input to further research (Malhotra, 1996; Pedhazur & Schmelkin, 1991; Zikmund, 2003).

In these aspects, the topic of the present study is proper for a qualitative and exploratory research method. First, for the topic, there are few studies in the existing literature. Either theory

does not yet exist or is unlikely to apply, or where theory exists the environmental context is different. Second, cause and effect among variables are doubtful or involve time lags. The learning process includes time-dependent relationships. Furthermore, Meyer and Sinani (2005) indicate that cross-sectional surveys for technology spillover research tend to systematically overestimate productivity spillovers. Therefore, a study on learning in technology spillover processes must consider time lags or time-dependent relationships.

### **Data Collection**

**Semi-structured interviews.** The research design of the present study emphasizes semi-structured interviews utilizing nondirective questions (Patton, 1990; Sargent, 1994). In the semi-structured interview process, the researchers ask each interviewee essentially the same set of questions. At the same time, the interviewer can share insights on topics or issues that would never come up using only surveys (Peterson, 2004). The conversation is allowed to proceed at its own pace; the interviewer simply has the responsibility to confirm that all the questions on the interview tool are addressed. Repeat visits may be made to finish the interview with the same person or to pick up additional interviewees (Choi & Hong, 2002).

**Data collection process.** First, the author visited RAMMAC and interviewed the specialist in the supplier development. She explained and gave useful information about supplier development programs in Reynosa, especially the RAMMAC supplier database and electric-electronics cluster program.

After interviewing the RAMMAC specialist in supplier development, the author selected the sample of local Mexican suppliers from the list of RAMMAC supplier database. Also, the author selected sample maquila plants, local governments and local universities in the member list of the electric-electronics cluster program of Reynosa.

In the U.S., that is, the McAllen, Brownsville regions, interviews were conducted first. After that, interviews were done in Mexico: Reynosa, Matamoros, Rio Bravo, Monterrey and Nuevo Laredo regions. Interestingly, many interviewees in Mexico were bilingual (English and Spanish). All maquila plant interviewees were bilingual. Local Mexican supplier interviewees in Monterrey were also bilingual. However, three local Mexican suppliers in Reynosa and one local Mexican supplier in Rio Bravo were not fluent in English. The author interviewed them with a Spanish translator. One local university interviewee was not fluent in English. The university officer asked other bilingual university staff to join the interview and help with the interview. The RAMMAC director was bilingual but she asked the Spanish translator complementarily. So, the author interviewed the RAMMAC director with a Spanish translator.

Three Spanish translators joined this research project. The author searched for all Spanish translators through organizations at the University of Texas-Pan American. The author conducted an orientation about the interview questions and presented an introduction to the research project to them. Additionally, two Spanish translators have the job or the extensive experience of Spanish translator in the maquiladora industry. The remaining translator was a master's program student in the college of business and was also familiar with Reynosa. Overall, Spanish translators were all familiar with the maquiladora industry.

For most interviews, the author visited the organization and explained the research methods and objectives of the project. After making an interview appointment, the author revisited and interviewed. For the remaining interviews, when the author visited the organization, without an interview appointment, interviews were done on the same day. Also, there was an international cluster conference in McAllen and Reynosa. In this conference, primary members of the electric-electronics cluster program joined. In this conference, in McAllen, the author interviewed the

director of the electric-electronics cluster program, and the author received much useful information. For one local Mexican supplier in Nuevo Laredo, the author conducted interviews by email twice because of the busy plant schedule. For additional information after interviews, the author revisited the organizations and interviewed additionally. Also, if necessary, the author conducted an email interview for additional information.

After interviews, in the same day, the author wrote memos and kept the recorded tapes. Except for the written answers, all interviews were recorded and all recording tapes were transcribed into English.

### **Interview Questions and Interview Analysis**

Interview guides and questions were developed to be used in the semi-structured interviews. The development of interview questions was based on the literature review of the related areas. The literatures for interview questions are primarily as follows: entrepreneurship in MNC; learning process of domestic firms from foreign firms such as technology spillover and technology transfer; supplier capability; governance structure; local embeddedness; maquiladora industry.

With this literature review, factors related to propositions were categorized

1. Entrepreneurial activities in the maquila plants
2. Learning of local Mexican suppliers and maquila plants
3. Capabilities of local Mexican suppliers
4. Governance structure between maquila plants and local Mexican suppliers
5. Local embeddedness of maquila plants

Proposition one and two are related to first, second and third factor categories. Proposition three is fourth and fifth factor categories. For the factors in the interview questions, as well as



these factors related to propositions, the other important factors related to the capability development of local Mexican suppliers were added in the interview questions. These additional factors for interview questions are primarily for the policy implication and supportive data for the test of the propositions. The additional factors for the interview questions are as follows:

6. The motive of transacting with local Mexican suppliers  
(The strength and weakness of local Mexican suppliers)
7. Capability development of local Mexican suppliers with the upgrading of maquiladora industry and opportunities and threats to local Mexican suppliers
8. The absorptive capacity of local Mexican suppliers
9. Border environment
10. Recession
11. Corruption
12. RAMMAC supplier develop program (supplier database) and Cluster program
13. Overall solution for capability development of local Mexican suppliers and the sector of the initiative role

Interview questions address each of these factors. Table 7 contains an outline of the interview questions. The Appendix contains the full text of the interview questions and other field materials. In table 7, the abbreviations indicate if the question was asked to local Mexican suppliers, maquila plants, local governments and local universities and RAMMAC.

The development of the interview questions proceeded in the following sequence: first, an initial set of questions were generated based on the literature reviews. After developing interview questions, one maquila in the city of Pharr (near McAllen) and one supplier in McAllen were contacted. The author pretested the interview questions and interviewed them. The pretest

interviewees were a logistics manager for a maquila and a sales manager for a supplier. They have all the job experience in maquila plants and understand the maquila industry and local Mexican suppliers well. They gave good comments for the interview questions and other good information.

After pretesting interview questions, the interview questions were clearly modified. The modified interview questions were translated into Spanish by one bilingual person. The person is fluent in Spanish and has the job of guiding the academic writing. After that, the first Spanish translator checked the Spanish version interview questions compared with the English interview questions. The translator has the extensive Spanish translator experience in the maquiladora industry. With these procedures, English and Spanish interview questions were finalized and completed.

Table 7

Measures

Variable	Measure
<b>Proposition Interview Questions</b>	
Entrepreneurial activities in the maquila plants	<p>The existence of entrepreneurial activities in the maquila plants (S, M, R)</p> <p>The reason for entrepreneurial activities in the maquila plants (S, M, R)</p> <p>Any important factors (e.g. border environment) that affect entrepreneurial activities in the maquila plants (S, M, R)</p> <p>Effect of entrepreneurial activities in the maquila plants on the capability development of local Mexican suppliers (S, M, R)</p> <p>Moderating effect of transactional characteristics between maquila plants and local Mexican suppliers on the relationship between entrepreneurial activities in the maquila plant and capability development of local Mexican suppliers (S, M, R)</p>

Table 7 (Continued)

Variable	Measure
	Moderating effect of the commitment of the maquila plants to the local community on the relationship between entrepreneurial activities in the maquila plants and capability development of local Mexican suppliers (S, M, R)
Learning of local Mexican suppliers and maquila plants	The extent of learning of local Mexican suppliers from maquila plants (or reverse question) (S, M)
	The content of learning of local Mexican suppliers from maquila plants (or reverse question) (S, M)
Capability of local Mexican suppliers	Capabilities that are necessary (or important) to the product or service of local Mexican suppliers (S)
	The way to obtain the capabilities that are necessary (or important) to the product or service of local Mexican suppliers (S)
	Assistance or interaction for the capabilities that are necessary (or important) to the product or service of local Mexican suppliers from the maquila plants (S, M)
	Evaluation of capabilities of local Mexican suppliers (M, G, U, R)
Governance structure between maquila plants and local Mexican suppliers	Transaction type between maquila plants and local Mexican suppliers (S, M)
	The effect of transaction type on the capability of local Mexican suppliers (S, M)
	The effect of transaction type on the business of the maquila plants (M)
Local embeddedness of maquila plants	The extent that maquila plants commit to the local community or contribute to the development of the local community (S, M)
	The effect of the commitment of maquila plants to the local community (or contribution to the development of local community) on the business of maquila plants (M)
	The effect of the commitment of maquila plants to the local community (or contribution to the development of local community) on capability development of local Mexican suppliers (S, M)
<b>Additional Interview Questions</b>	
The motive of transacting with local Mexican suppliers (The strength and weakness of local Mexican suppliers)	The motive to transact with local Mexican suppliers (S, M)
	Strength and weakness of local Mexican suppliers (S, M)

Table 7 (Continued)

Variable	Measure
Capability development of local Mexican suppliers with the upgrading of maquiladora industry and opportunities and threats to local Mexican suppliers	Capability development of local Mexican suppliers with the upgrading of maquiladora industry (S, M, G, U, R)
The absorptive capacity of local Mexican suppliers	Opportunities and threats to local Mexican suppliers with the upgrading of maquiladora industry (S, M, U, R) The extent of absorptive capacity of local Mexican suppliers (S, M, G, U, R) The way to increase the absorptive capacity of local Mexican suppliers (S, M, G, U, R)
Border environment	Other important factors (e.g. border environment) for capability development of local Mexican suppliers (S, M, G, U, R)
Recession	The effect of recession (S, M, G, U, R)
Corruption	The difference of supplier relations (e.g. transaction type etc) between local Mexican suppliers and maquila plants in the good and the bad economy (S, M, G, R) The sourcing strategy of maquila plants in the recession (M) The survival strategy of local Mexican suppliers in the recession (S, M, U, R)
RAMMAC supplier development program (supplier database)	Difficulties in the transaction between maquila plants and local Mexican suppliers (S, M) Corruption - problem and solution (S, M, R) Recognition of RAMMAC (S, M) Recognition of RAMMAC supplier development program (supplier database) (S, M) Participation to RAMMAC supplier development program (supplier database) (S) Participation of customer maquila plant to RAMMAC supplier development program (supplier database) (S) Satisfaction with RAMMAC supplier development program (supplier database) (M) Problems and developmental direction of RAMMAC supplier development program (supplier database) (S,M)
Cluster program	Recognition of cluster program (S, M, G, U, R) Participation to cluster program (S, M,G,U,R)

Table 7 (Continued)

Variable	Measure
	Participation of partner local Mexican supplier or maquila plant to cluster program (S, M)
	Benefits of cluster program (S, M, G, U, R)
	Problems and developmental direction of cluster program (S, M, G, U, R)
Overall solution for capability development of local Mexican suppliers and the sector of initiative role	Overall solution to increase the capability of local Mexican suppliers (S, M, G, U, R)
	The sector of initiative role for capability development of local Mexican suppliers – government, maquila plant, educational institute and local Mexican supplier (S, M, G, U, R)

The interviewer actively encouraged local Mexican suppliers, maquila plants, local governments, local universities and RAMMAC interviewees to add their own opinions or experiences. Also, the interviewer kept the active attitudes such as asking additional questions and investigating interesting responses. The length of the interviews varied greatly according to the attitude (talkativeness) or schedule of the person interviewed. The normal interview was approximately 45 to 120 minutes.

As will become clear in the results chapters, 30 organizations and 34 interviewees were interviewed. One organization’s interview was implemented by e-mails two times because of the busy plant situation. For additional or lost information, the author did additional interviews primarily by e-mail and partly by revisit. All interviewees provided usable information to each question.

Except for the written answers, all interviews were tape-recorded and transcribed into English. A content analysis of the interviews was done. The content analysis procedures in Bretz, Rynes and Gerhart (1993), Rynes, Bretz and Gerhart (1991) and Sargent and Matthews (1999) were similarly used. The author and a colleague read the transcripts. Both people then

independently designed alternative coding schemes. The coding schemes are to summarize quantitatively the response to each interview question. Both people then compared the coding schemes and developed a consensual coding scheme. The two people who had developed the coding scheme then completed the actual coding. The two coders agreed on 95% of the cases, and the final 5% were resolved by another person (doctoral student) who had knowledge of the study. Coding schemes for each question and representative answers are included in the result chapters.

The content analysis provides much information about study variables. Primarily, it is for the descriptive statistics related to specific questions. Furthermore, additional analysis (simple statistics like t-test) can be done to find relationships between responses to the questions and other characteristics such as participant characteristics and industry affiliation (Sargent, 1994). However, in this study, content analysis is primarily used for simple descriptive statistics related to specific questions.

## CHAPTER IV

### RESULTS

#### **Proposition Results**

The results section is directly related to the research propositions. The first part is about capability of local Mexican suppliers. This part is the base to understand the result about propositions. This part gives the basic understanding (or knowledge) of the capability concept in the capability development of local Mexican suppliers. The second part presents the results related to the propositions one through three. That is, it is about the relationship between entrepreneurial activities in the maquila plants and capability development of local Mexican suppliers.

#### **Capability of Local Mexican Supplier**

**Local Mexican supplier responses.** For the question, “What capabilities are necessary (or important) to the product or service of your company,” fourteen local Mexican suppliers (48%) answered technological capability. Nine local Mexican suppliers (31%) answered managerial capability. Six local Mexican suppliers (21%) answered financial capability. Local Mexican suppliers indicate the importance of their products or services in the order of technological capability, managerial capability and financial capability. Therefore, technological capability is the most frequent answer as the capability that is necessary (or important) to the product or service of local Mexican suppliers. The exhibit below (1) shows the items that local Mexican suppliers answered as those of each capability.

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(1) Technological capability

- Technology related to product
- Technology related to primary work
- Knowledge (or expertise) about processes related to the service
- Material technology related to product
- Equipment
- Technology / technical skills
- Communication for customer's requirements between local Mexican suppliers and the maquila plant through internet
- Best quality of product

(2) Managerial capability

- Employees' experiences or skills
- Ability of small business management
- People who work with common sense (or honesty)
- Capable people to manage technology
- Knowledge (or expertise) about Mexican regulation
- Documentation and (managing) statistics about operation of what local Mexican suppliers need and do to satisfy customers' needs

(3) Financial capability

- Financial safety in the border business (especially in a recession)
- Finance - something the local Mexican supplier always has

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Exhibit 1 Response to the question : What capabilities are necessary (or important) to the product or the service of your company?

Purpose : To determine the items of the necessary (or important) capabilities to the product or service of local Mexican suppliers (Local Mexican supplier)

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For the question, "How does your company obtain those capabilities," fifteen local Mexican suppliers (60%) answered internal education and training. Seven local Mexican suppliers (28%) answered external education and training. Three local Mexican suppliers (12%) answered government program education and training. To obtain the necessary (or important) capabilities, local Mexican suppliers use internal education and training most frequently. External education



and training, as well as government education and training, are the second and third most frequent answers. Exhibit 2, below, summarizes responses from local Mexican suppliers for items related to education and training.

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(1) Internal education and training

- On the job training
- Owner's industrial experience
- Processing of ISO certification
- Training through internal improvement (production line etc)
- Information acquisition through the internet
- Training in headquarters (e.g. R&D department)
- Vendors' visits and training
- Informal learning (e.g. Observing and benchmarking maquila)

(2) External education and training

- Maquila workshop participation
- Specific school program training
- Expo or conference information
- Industrial association training
- University program training
- University seminar or degree education
- Consultation from a local bank

(3) Government program education and training

- Government organization seminar or program training  
(Chamber, Cluster program etc)
- 

Exhibit 2 Response to the question : How does your company obtain the necessary (or important) capabilities?

Purpose : To determine the source for obtaining the necessary (or important) capabilities (Local Mexican supplier)

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Also, for the source of education and training of each capability, local Mexican suppliers answered that all three sources of education and training are used for technological and

managerial capability. For financial capability, local Mexican suppliers primarily use external education and training and government education and training.

For the question, “Is there any assistance for, or interaction with/from, those capabilities from maquila plants,” eight local Mexican suppliers (50%) answered that there is assistance or interaction for those necessary (or important) capabilities from maquila plants. On the other hand, seven other suppliers (44%) answered that there is no assistance or interaction from maquila plants. About half the sample of local Mexican suppliers answered that there is assistance or interaction from maquila plants for necessary (or important) capabilities. Also, for the content of assistance or interaction from maquila plants, most answers are related to technological capabilities. The answers of managerial and financial supports from maquila plants are not frequent. Exhibit 3 is representative of the answers of local Mexican suppliers.

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(1) Yes, we do definitely interact with design engineers; we most definitely work with the customers. We work very closely with engineers. As far as labels, we have been, you know, every maquila design engineer, I guess you can say ... back to design labels, says, you know, we do most definitely interact to get assistance from customers for free with every project we do. So, our company employees visit the maquila plant. People who work in maquila plants together do something, yes, a project... most definitely we visit them, they visit us, both. We go over there.

(2) For technological capability, we learn by joining maquila workshops. These workshops take about one week. Maquilas provide information (e.g. raw material). Also suppliers join and provide information and therefore maquilas learn. Suppliers compete for the lowest price in these workshops. Overall, these workshops can be thought of as a kind of assistance or support for suppliers.

(3) Feedback, yes. How to handle products or materials recycle process etc. No training program from maquila plants.

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Exhibit 3 Response to the question : Is there any assistance or interaction for those capabilities from the maquila plant?

Purpose : To determine the extent and the content of assistance or interaction for capabilities of local Mexican suppliers (Local Mexican supplier).

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(4) No we usually do training for them. We, actually I am responsible for the area in the training of several companies on waste management, safety... for them. *There is no assistance from maquila plant (Interviewer):* we don't get ...we give them.

(5) There is no specific assistance from customer plant, just provide them products.

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Exhibit 3 (continued)

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**Maquila plant responses.** For the question, “To what extent do you evaluate capabilities of local Mexican suppliers,” in terms of technological capability, two maquila plants (40%) answered high, two maquila plants (40%) low, one maquila plant (20%) middle. For managerial capability, two maquila plants were questioned and both (100%) answered middle. For financial capability, all three maquila plants questioned (100%) answered low. Overall, for technological capability of local Mexican suppliers, maquila plants show mixed evaluation; for managerial capability of local Mexican suppliers, the evaluation is middle. For financial capability of local Mexican suppliers, the evaluation is low. Below, Exhibit 4 demonstrates the answers of maquila plants.

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(1) *Compared to the other foreign suppliers, South Korea, or the other foreign suppliers, how about capability of local suppliers?(Interviewer):* Well, capability, we don't have any problems with the capability of Asian suppliers, Mexican suppliers, Local US suppliers ... I don't see any difference between Asian suppliers. So, US suppliers and Mexican suppliers ...

(2) The local suppliers have cheap resources. They satisfied our minimum requirements, ISO certification. For technology, the level of technology is generally low, but sometimes the technology of some suppliers is high.

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Exhibit 4 Response to the question : To what extent do you evaluate capabilities of local Mexican suppliers?

Purpose : To find the evaluation of capabilities of local Mexican suppliers (Maquila plant).

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For management, they don't bring the best for leaders of the company; in other words, there are able managers and incapable managers, and therefore it is mixed. For financial management, the market is sensitive to economic conditions not only in Mexico, but everywhere. Last year many suppliers were impacted by an economic downturn from Asia to U.S.. Most molding suppliers were bankrupted.

(3) I'm going to say, still in the learning stage of automotive.

(4) *My question is, from your experience, with the local Mexican suppliers, you think their capability is low or high?*(Interviewer): I would say it's probably... it depends on what area you're in. *First of all, the technology capability* (Interviewer): Technology capability, technical capability has come a long way in the last 5 years. I would say it's probably up in the... from a 1 to 10 range, it's probably into the 7. There are several good universities in Reynosa now, technical universities, and some outstanding universities in Monterrey. We have a lot of graduates from Monterrey. The technical level is coming up quite a bit. *And the managerial type?*(Interviewer): Actually, it's come up also. Just from our plant experience when we first started here in 98 -97 all of the managers were U.S. managers and over the years, 80% of our managers are Mexican nationals, so the managerial experience has come a long way also. *And the managerial performance is not bad, good?*(Interviewer): Yes its good. *Financial capabilities from the suppliers?*(Interviewer): I would say that's probably one of their weaknesses because a lot of the suppliers don't have a established banking and its difficult to get that so. They're operating on, I mean, they have to have, the payment terms in Mexico are usually 10 days. So, 10 days from the day you receive and you sign the invoice they expect the payment. We were able to negotiate with our suppliers primarily because we choose sound suppliers. We negotiated terms up to 45 days with our suppliers.

(5) Nothing much, pretty much they have trade shares. Once in a while, the plastic companies, we go visit them and we come away with here's maybe a candidate; that's maybe occasionally once or twice a year we're doing that, but we don't really spend too much time doing it. Generally, the best case is that we don't have to change suppliers, but you know, but plastic companies usually seem to have issues, especially with this current recession many plastic companies have gone bankrupt; you know we've had two suppliers for us that have gone bankrupt, a third one was dangerous so we stopped doing business with them, one wanted to move business away from a factory they had in McAllen to move up North, so because of the current recession we've had more opportunities to move parts, but there's such a limited number of qualified Mexican suppliers, we move most of our business in house to .... as opposed to local Mexican suppliers. But, anyways, occasionally you know basically trade shows, if we find something we like, we'll go visit. But many of those companies, too, though, have foreign parents, they're in Mexico but their parent company is foreign.

(6) We purchase raw materials from local suppliers, so it is difficult to develop suppliers' technology capability. We inform suppliers of our weekly demands. Also we have regular suppliers meeting primarily for their production schedule and sales plan.

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Exhibit 4 (continued)

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When asked, “Is there any assistance or interaction for capabilities of local Mexican suppliers from your plant,” seven maquila plants (77%) answered that there is the assistance or interaction for capabilities of local Mexican suppliers from maquila plants. Two maquila plants (22%) answered that there is no assistance or interaction. Overall, the sample maquila plants answered in higher percentages of assistance or interaction than the answer of local Mexican suppliers. Exhibit 5 below shows the responses of maquila plants.

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(1) Yes. First, we select, develop and continue to evaluate suppliers and therefore we assist suppliers. We improve the process and the technology of suppliers. Also for suppliers, we solve (or improve) efficiency issues and anything related to the manufacturing process. We have engineers and assign them to each line or commodity. We make them work on the improvement with suppliers. We also assist the suppliers by looking for the waste and improving things related to quality and delivery. ....

(2) We interact very frequently with local suppliers regarding our production because their materials are importantly used and affect our production. We assist local suppliers technologically. For example, when local suppliers have some problems with manufacturing or quality, we go to supplier plants and solve the problems. However, we don't assist financially. For example, we don't give money to suppliers that have financial problems. Only sometimes do we give the payment earlier.

(3) We have training programs for suppliers by off-line and on-line. The program includes a quality expectation, quality tools and so on.

(4) We provide Lean. We teach Six Sigma. These types of activities we will share with the suppliers. *This plant teaches these techniques?(Interviewer): Yes.*

(5) We partner with good suppliers from Reynosa and we do that for a reason and that's because they can assist us in helping solve our issues. I refer to the machine shops, we have very good local machine shops in Reynosa that we're partnered with and we can provide them, in some cases, we can provide them, hand drawn steps and 'I need the tool do to this this and this,'

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Exhibit 5 Response to the question : Is there any assistance or interaction for capabilities of local Mexican suppliers from your plant?

Purpose : To determine the extent and the content of assistance or interaction for capabilities of local Mexican suppliers (Maquila plant).

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on this piece of equipment and they are very careful about going in and designing that and coming back and saying, 'Here is what we came up with, and we think it'll work,' and it does work. So we do leverage off of that.

(6) Yes it is. From our side? We have, as I said, most of our suppliers are tooling, I mean molded parts, so we support them, we visit them, we see what kind of improvements they have done, what they need to do. In case of any issues that they cannot find a way to fix it, we send someone from our tooling department to support them. In case that they have issues or to support delivery, if they inform us on time, we can support them. We can evaluate what the impact is going to be. We give them minimum requirements. We always support our suppliers, even if it is local or wherever, US, Japan or wherever, but when it's local it's easier. Let's say a tool breaks with our supplier that is here in Reynosa, we can go and in 10 minutes be there and see what we can do to support, to help them, to fix the problem, what suggestions we can offer.

(7) Not really, realistically no.

(8) We purchase raw materials from local suppliers, so it is difficult to develop suppliers' technology capability. We inform suppliers of our weekly demands. Also we have regular suppliers meeting primarily for a production schedule that reflects a sales plan. No technical and financial support for suppliers. Also, we don't receive any technical assistance from suppliers.

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Exhibit 5 (continued)

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For the capability type of assistance or interaction, most sample maquila plants answered that there is the assistance or interaction for technological capability of local Mexican suppliers. Managerial and financial capability of local Mexican suppliers, the assistance or interaction seems to be infrequent.

**Local government, local university and RAMMAC responses.** For the question, "To what extent do you evaluate capabilities of local Mexican suppliers," local government, local university and RAMMAC gave mixed answers.

One government officer evaluated the capabilities of local Mexican suppliers as high evaluation for technological and managerial capability and low evaluation for financial capability. One local university officer evaluated the capabilities of local Mexican suppliers as high evaluation for technological and financial capability. The director of RAMMAC evaluated

the capabilities of local Mexican suppliers as low evaluation for technological, managerial and financial capability. The exhibit below (6) provides the answers of local government, local university and RAMMAC.

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#### Local government

Mexican suppliers can do as well as the American suppliers. They need the trust of the maquiladoras. Some of the local Mexican suppliers are better than American suppliers, because of the product quality and the logistics. They don't have to cross the border and pay the taxes related to importation or exportation. Logistics are an important point. In that way, local Mexican suppliers can be more competitive.

For technology, sometimes, or not always, local Mexican suppliers have the same technology as American suppliers. If they don't didn't, they couldn't be as competitive as American suppliers.

For finance, Mexico is experiencing a very big crisis right now. The United States is also in a crisis. What happens? Small suppliers, they don't have credit, or enough money. It is difficult for them to have the support of a bank. They are broke or are closing because the customers (industries or facilities) delay their payments to them (e.g., by fifteen days, one month, or three months), because they need to pay salaries to their own employees or other associated companies.

#### Local university

Very good. Reynosa, the industry has high technology. Financial capacity is good.

#### RAMMAC

For technological capability, most of the local suppliers in the Reynosa region are related with indirect materials; that is, not directly related to the quality process of the company. Most of these services don't include technological capability because the kinds of equipment are more with direction or support from maquila industry

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Exhibit 6 Response to the question: How do you evaluate the level of capabilities of local Mexican suppliers?

Purpose : To find the evaluation of capabilities of local Mexican suppliers  
(Local government, Local university and RAMMAC).

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For managerial capability, local suppliers still need the support of government. There is a government program which supports the maquilas in getting people, high level people to provide good service.

For financial capability, the practice of maquilas of paying local suppliers is characterized by delays of one week, in some cases delays of up to two months. So, local suppliers don't have enough financial support; government's support is necessary. There are government financial support programs for local suppliers.

For this, there is a cluster program for local suppliers.

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Exhibit 6 (continued)

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In total, there were eight respondents for technological capabilities. Four respondents (50%) answered high, one respondent (12.5%) answered middle and three respondents (37.5%) answered low. There were four respondents for managerial capability. Two respondents (50%) answered middle, and two other respondents (25%) answered high and low. There were six respondents for financial capability. Five respondents (83%) answered low, and one respondent (16.66%) answered high. In summary, for technological capability, high and low evaluations, the mixed result; for managerial capability, middle evaluation is more prevalent than high or low evaluations, but, overall there are mixed results. For financial capability, low evaluation is the more frequent answer.

**Proposition One:**

**Entrepreneurial activities in maquila plants have a positive effect on capability development of local Mexican suppliers**

Proposition one examines whether there are entrepreneurial activities in maquila plants and their impacts on the capability development of local Mexican suppliers. Interview questions related to this proposition were asked to maquila plants and local Mexican suppliers, especially as seen in the capability of the local Mexican suppliers section. Capability concept in capability



development of local Mexican suppliers means primarily technological capability and partly managerial capability. In the actual interview process, respondents understood the capability according to this concept.

### **Maquila plant responses**

*Entrepreneurial activities in the maquila plant.* Entrepreneurial activities were explained to respondents as three types of activities - (1) new products developed in the plant (2) enhancements to product lines in the plant (3) new corporate investments in research and development (R&D) or manufacturing attracted by plant management. These items were revised from the items of subsidiary initiative in previous literature (Birkinshaw, Hood & Jonsson, 1998).

Eight maquila plants (89%) answered that there are entrepreneurial activities in the plant. Exhibit 7 presents the entrepreneurial activities that respondents cited. First, for the entrepreneurial activities, most answers are related to enhancements to production lines in the plant. Second, almost all answers are unrelated to new product development. Primarily, then, enhancements to production lines and partly new corporate investments in R&D or manufacturing (by plant management) are strong, but product development is weak. For the product development, one maquila interviewee answered that there is the same company's design center in Mexico. Another maquila plant interviewee answered that the headquarters in the U.S. do the product development or design. For new product development, a few maquila interviewees answered, "Not yet in our plant."

One sample maquila plant shows slightly different characteristics compared to the other sample maquila plant. This maquila plant is a subsidiary of a small and medium sized multinational corporation. The number of employees is relatively small. Before five years this maquila started up. This maquila plant does the injection molding service. This maquila plant

entered Reynosa and originally started the business to provide cell phone components to a primary customer, another maquila plant in Reynosa. However, the situation was not good. The primary business changed into auto components because of new market opportunities; many U.S. suppliers in the auto industry went bankrupt. This maquila tried to change its main business and implement continuous investment. Also, the headquarters in the home country offered support primarily for technical parts. Interestingly, this maquila does not conduct business with the same home country's large maquila plant in the same region (included in the maquila sample) and has tried to start up an independent business or localization. Overall, in relation to entrepreneurial activity, this maquila plant seems to be somewhat different from the other sample maquila plants; this means, the subsidiary of a large multinational company.

For the maquila plant that answered no, the maquila plant answered that they get a repair line. Customers ask them to repair their products. They go to the customers and suggest changes in efficiency - cost, function, but there is not an entrepreneurial effort.

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(1) There is no product development. Our plant makes much effort in the recession. Especially our plant improves about the waste, sometimes improve time waste. *(In other words, this plant seeks to cut down on waste and the wasting of time).*

(2) It is the improvement of manufacturing. That is, we invest in how the line is running and then propose ways to improve the cycle of the production line by modifying the manufacturing structure. Additionally there is a team of people in charge of that, called MS (Manufacturing System) Team.

(3) Not here, not really. About every 4 or 5 years, the design of the seatbelts changes. So, the change of the seatbelt brings in a change of the supply base also. I look at entrepreneurial activities, also, probably as continuous improvement, right? Do you agree? Do you know what continuous improvement is? Change is always required to survive.

(Continued on next page)

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Exhibit 7 Response to the question : Are there entrepreneurial activities in the plant?

Purpose : To determine whether entrepreneurial activities in the maquila plants exist, and what the entrepreneurial activities are (Maquila plant).

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(4) Yes, we have some new models coming in January, we are sending more during the year. *Please explain in detail. So, a new model means this plant developed a new model?(Interviewer):* Here, in this plant, we don't have design but we do the introduction of the model, we run the new model. It's not designed here in this plant, but it's a new product that we are releasing, I think one of them is BMW, Ford and Honda. *So, first new product development, second enhancements to product line, third R&D. Then, second and third sometimes in this plant right?(Interviewer):* Yes we do enhancements, we improve the lines, we try to reduce people and we try to increase production outputs. What does R&D mean? *Research and development. This means in this plant, management suggests new research and development in manufacturing from headquarters pointed to new corporate investment in this plant, sometimes?(Interviewer):* Yes, much of the time. When a new product comes we have to install more equipment, more lines, so they have to invest of course. *So product design is no, but second and third yes (Interviewer).*

(5) You say enhancements to product line, what do you mean by that? By enhancements to product, you mean improvement of the product itself? *Yes, yes...(Interviewer)* See our company is basically, we got a maquila, so their job is to receive parts, and assemble them, so enhancement of the product is very limited, but what they're focusing on right now is enhancing their processes...their manufacturing process, you know, how to assemble more efficiently and how to keep a clean environment as well; they're kind of growing technology, we have a injection molding operation, and painting operation, laser etching operation, so they are kind of vertically integrating the manufacturing process and trying to improve the manufacturing process, but in terms of the product, it's very limited.

(6) We changed the original business. Because of customer or market changes, we produce from items from a cell phone case to the most recent auto product case. We plan no retrenchment or divestment. So we do the continuous investment. There is support from the home country headquarters.

(7) Not at this time. Not at this time. *Why?(Interviewer):* I mean, we are generally, we are a repair house. We do provide solutions to our customers. We will get a repair line, we will repair and as we gain experience on that repair line we will go to our customers and suggest changes in efficiencies that will reduce cost, some functional enhancements, but, primarily, I wouldn't say there's any entrepreneurial endeavors.

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Exhibit 7 (continued)

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***The reason for entrepreneurial activities in the maquila plant.*** For the reason for entrepreneurial activities in the maquila plants, five maquila plants (55.55%) answered this question. First, four maquila plants (57.14%) answered the improvement in the manufacturing process. This is the most frequent answer. Second, two maquila plants (28.57%) answered getting third party business (i.e., attracting more customer product into the plant). Third, one

maquila plant (14.28%) answered that local settlement (no entrenchment or no divestment). For this particular maquila plant, the CEO planned to settle locally in the United States. Therefore, this maquila plant continues to find new business (i.e. new customers or industries) for its survival and maintains continuous investment. Exhibit 8 presents the reasons for the entrepreneurial activities in the maquila plants.

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(1) It is to improve flow and cost and it is for the competitiveness of the plant. Additionally, this plant is the manufacture site, so we do not develop any product. We have a Mexico technical center which develops products.

(2) We need entrepreneurial activities to survive (continuous improvement).

(3) Why, because of course we want to increase our capabilities. We want to be a better plant so more products can come to this facility. So we can be able to produce more products here. We want to show them that we can do it, that we have the capability, that we have the creativity and we can manage the business.

(4) *Yes, but anyways, the production line continues to be developed or enhanced because of the efficiency issue something... (Interviewer):* Yes, the efficiency and quality. How to improve quality and minimize cost and, as I said, increasing the vertical integration of the plant... and laser etch operation as well as surface mount technology, so all those areas are more sophisticated and require improvements. Also, material handling. You know how to raise parts in a more efficient manner to help reduce inventory. Minimize inventory losses, those kinds of things are all areas that they focus a significant amount of time on to improve. But in terms of the product itself and designing the product, no. *So why are there are entrepreneurial activities in the plant? (Interviewer):* I said to improve the entrepreneurial aspect maybe that's how it can be used, the manufacturing process I think, but not for the developing part. Also they want to, the goal is eventually getting third party business. You know, not just manufacture for our outside.... But the manufacture for other companies, but that's a little bit different, I think, newer than the entrepreneurial.

(5) We plan no divestment and retrenchment regardless of poor or good performance. Additionally, the CEO personally plans to live in the United States, which will strengthen our companies plan. So, we try new business (according to customer and market changes) and continuous investment.

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Exhibit 8 Response to the question : Why are there entrepreneurial activities in the plant?  
Purpose : To determine the reason for entrepreneurial activities in the maquila plants (Maquila plant)

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Overall, the improvement in the manufacturing process is the most frequent answer. It is primarily for efficiency (e.g. cost reduction) and quality. Furthermore, it seems to be for competitiveness or the capability of the plant. This is especially true if the maquila plant's business is to manufacture and provide the parts or components fitting new customer product models. The competitiveness or the capability of the plant is to attract more customers' products or to get the third party business into the plant. This type of maquila plant answers that this point is a little bit different from the improvement in terms of their own manufacturing.

For one maquila plant, the maquila is a subsidiary of small and medium sized multinational companies, compared to the other sample maquila plants. The survival after the entrance is an important issue. That is, no plan of retrenchment or divestment, especially a CEO's plan of local settlement in the U.S., is an important issue. Thus, the business, when entering the market, may be changed and try to find new business, especially new industry customers. Headquarters' support is primarily technical. In the same region this trend is strong because they try an independent business without the business with the same home country's large maquila plant. This case is a bit different when compared to a maquila plant of larger size that is part of a multinational corporation which produces the same product designed in headquarters.

***Any important factors (e.g. border environment) that affect entrepreneurial activities in the maquila plant.*** For any important factors that affect entrepreneurial activities in the maquila plants, only two maquila plants (22%) answered the factors. The other maquila plants answered that there are no other factors. Response rate is low. Overall, for this question, there is no strong answer. One maquila interviewee answered the lower labor rate. That is, in the same company's many plants, his plant is low cost. Therefore, whenever there's something new, such as new design or a new product, they look at his plant first. This manager thinks that lower labor rates

make his plant first choice. The other maquila plant answered local culture, such as social connection. This maquila plant tries to do new business and continuous investment to settle in this region. The local culture has a big impact on the business for this maquila.

***Effect of entrepreneurial activities in the maquila plant on the capability development of local Mexican suppliers.*** For the question, “Do the entrepreneurial activities in the plant affect capabilities of local Mexican suppliers,” three maquila plants (33%) answered yes. Three maquila plants (33%) answered potentially yes. Two maquila (22%) plants said no. One maquila plant (11%) skipped the question.

Overall, maquilas recognize that more business in maquilas translates to more business opportunities for local Mexican suppliers. In this aspect, maquila plants think of the positive effect of entrepreneurial activities in the maquila plants on capabilities of local Mexican suppliers. For a maquila manager who answered no, the manager comments that the impact on local Mexican suppliers is in the supply chain, based on buy and sell operations. It has no relation with entrepreneurial activity, new business or manufacturing business. Exhibit 9 shows the answers of maquila plants.

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Yes

(1) As we progress, they progress. Our plant provides growth to local suppliers as our product evolves.

(2) Yes. As our business grows, local suppliers' size or knowhow will increase. There will be impact.

(Continued on next page)

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Exhibit 9 Response to the question: Do the entrepreneurial activities in the plant affect capabilities of local Mexican suppliers?

Purpose : To determine the effect of the entrepreneurial activities in the maquila plants on capabilities of local Mexican suppliers (Maquila plant).

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Potentially yes

(1) Yea, probably we can. We might need something in the past, we needed more effective way... But I'm not in charge of that...also, we have services for suppliers.... So we may affect the local suppliers.

(2) I don't think it affects them. It may even be a good chance for them to expand. As long as we get more business, we will be able to give more business to our suppliers, to our local suppliers.

(3) I don't think so, you know we do have suppliers that make... equipment for us that you know, you know working with... in terms of building equipment, you know, might help improve Mexican companies, we have engineers that work with Mexican equipment makers and I'm sure there's some amount of innovation regarding that but I'm not the right person to discuss that, our engineering department handles that.

No

I mean the only way that our activities impact the local suppliers is obviously is, if I mean, from a supply chain. That's, currently that's all it does. It doesn't add any new business, manufacturing business, into the local supply chain. That's basically just a buy and sell operation. The activities, I mean, we have no entrepreneurial activities that will impact. Other than tooling and fixturing where we have to build new tooling. And yes, that would impact then but it's not really an entrepreneurial type situation.

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Exhibit 9 (continued)

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**Local Mexican supplier responses**

*Entrepreneurial activities in the maquila plant.* For the question, "Are there entrepreneurial activities in the maquila plant," local Mexican suppliers' answer is a rather indirect sort of information. However, because they do business with maquila plants, this information from local Mexican suppliers is additional, complementary to the information from maquila plants.

Eight local Mexican suppliers (50%) answered that there are entrepreneurial activities in the maquila plant. Two local Mexican suppliers (13%) answered that there are no entrepreneurial activities in the maquila plant. The remaining six local Mexican suppliers (37%) did not answer,

or answered “I do not know,” or misunderstood that this question is about their own plants (missing data).

Almost all local Mexican suppliers who answered entrepreneurial activities in the maquila plant did not give clear information about the concrete entrepreneurial activities taking place in the maquila plant. Overall, the entrepreneurial activities in the maquila plant that local Mexican suppliers answered are new manufacturing processes in the plant.

For example, one local Mexican supplier observes that in the label applicator of electronics, the automatic lines were established for the manpower in that maquila plant. Below, Exhibit 10 gives the responses of local Mexican suppliers.

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(1) Customer plant? You know, I am not sure. I mean I have seen I guess I can say that probably won't come ... Label applications, label applicator, automatic label applicators, ... are no longer used in individual manpower, it's a machine that actually puts the labels on the product. So, it means, one example, it's just as far as one example, product lines that I have seen. *Ok. So, customer plant (Interviewer): Yes. Customer plant. New product, new product lines. You have seen (Interviewer): Electronics plant. Yes. What do you think, this entrepreneurial activity in the maquila plant is a recent and strong phenomenon? (Interviewer): No, not necessarily no, not relation, no. Not necessary strong, but appears. This entrepreneurial activity appears, this entrepreneurial activity appears in the plant? (Interviewer): Yes, But not strong (Interviewer): No.*

(2) My question is about, well, we get involved in new processes, every time all customers bring new process we have to get involved, because they involved new products, new documentation, new reports, things of that nature. We get very involved in them. We also get to come and to discuss certain aspects of environmental safety. We get involved with all them, so we get to learn the new process with them, that's how we develop the relationship. *You mean for the customer maquila plants, there are those activities in the plant (Interviewer): Yes.*

(3) There are entrepreneurial activities in the maquila plant. However, we do not have many opportunities to join or get involved with those activities because we need many certification processes or capability development processes. (Continued on next page)

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Exhibit 10 Responses to the question: Are there entrepreneurial activities in the maquila plant?  
Purpose : To determine whether entrepreneurial activities in the maquila plants exist, and what the entrepreneurial activities are (Local Mexican supplier).

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Overall, it takes a long time for us to prepare.

(4) *Maquiladora plant (Interviewer)*: I don't know.

(5) No, they are centrally-controlled through their corporate office in the US.

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Exhibit 10 (continued)

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***The reason for entrepreneurial activities in the maquila plant.*** For the question, “Why are there entrepreneurial activities in the maquila plant,” six local Mexican suppliers who answered those entrepreneurial activities in the maquila plant indicated various reasons. Two local Mexican suppliers (25%) answered to reduce cost (efficiency), this being the most frequent answer. The remaining suppliers answered (12.5% per answer) as follows : to be competitive in the market, to maximize the cost benefit for external customers and internal customers (e.g. investors), quality improvement, higher demand, learning from machinery or workshop and problem solving through exchanging ideas. Exhibit 11 is one representative answer of local Mexican suppliers.

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(1) To reduce cost, to be more efficient. That is efficiency, it is something that we have seen in the past year, so increase drastically. You know, from automatic applicators to reducing manpower. To going with cheaper materials, all of that, we have seen in the past years. Right now the primary goal that we have seen in the manufacturing industry in the custom border is efficiency, becoming as efficient as possible. *Because of the primary efficiency issue, there are these entrepreneurial activities in the customer plant?(Interviewer): Yes. But, because of new market opportunities in the borders, Mexico, so is there this entrepreneurial activity in the plant? Independently?(Interviewer): Independently no. In the plant, because of new market opportunity, the border, new product development in the customer plant?(Interviewer): No. Not necessarily. No.*

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Exhibit 11 Response to the question : Why are there entrepreneurial activities in the maquila plant?

Purpose : To determine the reason for entrepreneurial activities in the maquila plants (Local Mexican supplier).

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***Any important factors (e.g. border environment) that affect entrepreneurial activities in the maquila plant.*** For the question about any important factors, especially the border environment that affects entrepreneurial activities in maquila plants, three local Mexican suppliers (37.5%) who answered entrepreneurial activities in the maquila plant commented on the factors. The remaining local Mexican suppliers (62.5%) are missing data or provided no information. Response rate is low. Two local Mexican suppliers (66.6%) answered the economic situation (economic crisis). The other one supplier (33.3%) answered the environment of research and development.

***Effect of entrepreneurial activities in the maquila plant on the capability development of local Mexican suppliers.*** For the effect of entrepreneurial activities in maquila plant on the capability development of local Mexican suppliers, of eight suppliers who answered entrepreneurial activities in the maquila plant, five suppliers (62.5%) answered no. Only one supplier (12.5%) answered yes.

For the local Mexican suppliers who answered yes, they commented that sometimes, customer maquila plants required new services to this supplier for some entrepreneurial activities in their plants. For these new projects in maquila plants, the local Mexican supplier has the opportunity to develop capability. The local Mexican supplier comments that the service may be different for customers; however, almost the same capabilities are used. Exhibit 12 below is representative of the answers of local Mexican suppliers.

***Learning from maquila plants.*** Answers about learning from maquila plants explain the proposition results supplementary, because learning of local Mexican suppliers may play a moderating role.

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(1) Well, I know, entrepreneurial, but all of this production I mention this half year they do affect ... a little bit. Yes.

(2) I don't know, I mean, I guess it is a good help but right now I haven't seen much change. Good help. But, I haven't seen much change. I think, most of the entrepreneurial stuff it's technical it doesn't go too much to supply chain, they keep using the same supply chain they used over time, and I don't know that's what I see.

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Exhibit 12 Response to the question : Do the entrepreneurial activities in the maquila plant affect capabilities of your company?

Purpose : To determine the effect of the entrepreneurial activities in the maquila plants on capabilities of local Mexican suppliers (Local Mexican supplier).

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For the question about the learning from maquila plants, thirteen local Mexican suppliers (81%) answered that they learn from maquila plants. Two local Mexican suppliers (13%) stated no learning was gained from maquila plants.

As to the extent of learning, seven suppliers (43%) answered strong learning. Five suppliers (31%) answered no extent of learning at all, but that they learn from maquila plants. Three local Mexican suppliers (18%) answered no learning or very limited learning.

For the contents of learning, suppliers answered the various learning contents. Twelve suppliers (75%) answered the contents of the learning. Below, exhibit 13 demonstrates the attitudes of local Mexican suppliers. Among the contents of learning, eight suppliers (36.36%) answered process in the plant. This is the most frequent answer. Three suppliers (13.63%) answered product and plant management, which is the second frequency. Each of the two remaining suppliers (9.09%) answered managing people, technology, self-learning for customer satisfaction, etc.

Overall, almost all local Mexican suppliers answer that they learn from maquila plants. The related capability of local Mexican suppliers is primarily in technological capability. The

manufacturing process in the plant seems to be the most frequent answer relevant to the learning process of local Mexican suppliers. This characteristic of learning may be one potential proof of the effect of entrepreneurial activities in the maquila plants on capability development of local Mexican suppliers.

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(1) Efficiency. Running and operation, lean manufacturing type. Try to spend less time wasting time, which means focusing on doing your product activity, trying to get out as much product as we can, you know, being efficient. You know, not wasting time. *Your customers' maquila plant educates your company. Educate or training (Interviewer)?*: They don't train or educate. I guess, just by what we see. *Through transactions with customers, naturally, learning... (Interviewer):* Right, yes. *Your company try to accept or do management technique or something, sure, similar to maquila plant or customers? (Interviewer):* Yes, we definitely do. We look at how to become efficient. You know, I mean, like go back to set up computer system equipment, we purchased job management software last year for how operation makes things more efficient. This software makes work easier, and makes work more productive. *Kind of copy, benchmark? (Interviewer):* Sure, sure, benchmark. *Maquila plants don't educate officially, through long transaction, your company try or benchmark the advantage? Advance?(Interviewer):* Exactly. *Right. I know, Reynosa regions, some maquila plants, world top-class company (Interviewer):* Yes.

(2) We learn policy from the client, how to do recycling process.

(3) Great thing. We learn a lot regarding organization safety, business practices, and environmental policies.

(4) We learn from the customers, the only learning we face is new process, we get a new experience, new process, something like that.

(5) Every company requires a different capacity from us to provide the service, so we are involved to try to keep up with technology on the product to be able... company... you know it's gonna be better quality and better price so we do that.  
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Exhibit 13 Response to the question : To what extent does your company learn from the maquila plant? And what does your company learn from the maquila plant?

Purpose : To determine the extent and the content of learning of local Mexican suppliers from maquila plants (Local Mexican supplier)

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- (6) We learn a lot from various customers, especially the issues related to technology and people.
- (7) We learn a lot. First, we learn the best practices like some processes of customer plants about environmental issues. Second, we send people to the customer plant and learn about running the machine or process (for a difficult situation).
- (8) We Learn about the products that customers use for some applications (probably the products are related to our products). This learning about customer products is related to sales (That is, sales of our applied product to the other customers)
- (9) We learn a lot from customer plant. Customer plant requires us to be more green. *“Green” being related to cost reduction, being familiar with environmental issues? (Interviewer):* Yes. This supplier plant learns how the customer plant deals with the green issue (i.e quality inspection with green related problem).
- (10) In the transaction of maquilas, we respond to (or solve) individual requirements and as a result we learn about our products. Also, because maquilas are larger-sized and management is more systematic, when we visit maquilas because of the transaction, we learn about procedures such as security, safety, etc., or ISO certification.
- (11) We learn, technological capabilities, etc.
- (12) Learn a lot from maquiladoras such as quality, security and presentation. We grow with maquiladoras.
- (13) Very limited. Just the overall approach to problem solving if problems arise.

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Exhibit 13 (continued)

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As supportive interview data, RAMMAC director comments that there are entrepreneurial activities in the maquila plants. Maquila plants consolidate operations (or processes) in separate regions (for example, Mexicali and Reynosa) into one place (for example, Reynosa) because of economy (or cost reduction). In this aspect, RAMMAC director also indicates cost reduction as the important motive of entrepreneurial activities in the maquila plants. Also, RAMMAC director commented these entrepreneurial activities affect the capability development of local Mexican suppliers because they increase the service of local Mexican suppliers. This seems similar to most maquila plants’ answer which was yes, or, potentially yes.

In the summary of the results about proposition one, there appears to be only mixed or partial support for proposition one. Overall, maquila plant managers say that there are entrepreneurial activities in the maquila plants. These activities are primarily for improvement in the manufacturing process. The primary goal is efficiency and quality. Also, these activities are potentially the opportunities for capabilities of local Mexican suppliers. Though there is lack of a direct link now, potentially it may be more business opportunity. For local Mexican suppliers, there is the limitation of information (as indirect information), though there is interaction between local Mexican suppliers and maquila plants. So, for local Mexican suppliers who answered those activities, they didn't give the contents of the clear activities; however, their answers are new manufacturing processes in the maquila plants. For the reason of those activities, numerous reasons were suggested including efficiency which means cost reduction. This is a somewhat frequent answer among local Mexican suppliers who provide those activities as answers. For the effect of entrepreneurial activities of maquila plants on the capability development of local Mexican suppliers, only one local Mexican supplier answered the effect. That is, when the local Mexican suppliers are involved in the new process of maquila plant, learning takes place, and it may be the opportunity to build the capability. However, most of the remaining local Mexican suppliers do not recognize the effect. Considering maquila plants', local Mexican suppliers' and RAMMAC's answers, entrepreneurship in the supply chain or continuous innovation through collaboration in supply chain - Collaborative entrepreneurship - these logics are not strong in the sample of maquila plants and local Mexican suppliers. Also, the entrepreneurial activities in the maquila plants now show the lack of direct linkage with the capability of local Mexican suppliers. However, there may be an opportunity to develop the capability of local Mexican suppliers. Therefore, proposition one is partially or mixed supported.

## **Proposition Two :**

### **Capability development of local Mexican suppliers has a positive effect on entrepreneurial activities in maquila plants**

**Maquila plant responses.** For this proposition, learning of a maquila plant from local Mexican suppliers can be a mediating role. Therefore, the learning of a maquila plant needs to be considered in this proposition section.

For the question, “Does your plant learn from local Mexican suppliers,” eight maquila plants (88%) answered yes. One maquila plant’s (11%) answer is missing. Almost all maquila plants answered that they learn from local Mexican suppliers.

Concerning the extent of the learning, five maquila plants (55%) didn’t suggest the clear extent. One maquila plant (11%) answered a lot of learning. One maquila plant (11%) answered not much learning, and one maquila plant (11%) answered fairly low learning. Overall, the extent of learning is not clearly answered.

For the content of learning of maquila plant from local Mexican suppliers, maquila manager answered various learning contents. First, three maquila plants (23%) answered to learn local adaptability. That is, maquila plants learn the local culture from local Mexican suppliers. This is related to doing business with social connections. Two maquila plants (15.38%) said to learn how to improve the process. Probably, in reference to the manufacturing process, maquila plants learn about potential improvements in the process. Two maquila plants (15.38%) answered to gain product expertise or knowledge. Three answers are relatively more frequent ones. Each of the remaining maquila plants answered various learning contents such as flexibility,

innovativeness, problem solving for customer plants' tooling requirements with new ideas, and seeing suppliers' mistakes and fixing or avoiding them. Exhibit 14 gives the views of maquila plants.

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(1) There is a shared learning. *Learning from local Mexican suppliers?* (Interviewer): Right. We, even though we are a global company, don't know everything. We go in learning about how to improve our processes with local culture ... we learn a lot from local suppliers. We are learning to manage people, we learn how to process.

(2) We do so many benchmarking. Some suppliers' local adaptability, flexibility, innovativeness. Yes, we learn from some suppliers. Our plant and suppliers learn from each other.

(3) Mostly our suppliers would learn from us, rather than we learning from them. We did the benchmarking. We had visited all our company plants as well as ones in this region to see what they were doing, how they were doing. Right now, we are also visiting our company plants because of the economy. Additionally, we visit not only suppliers, but also competitors (For example, companies in Monterrey).

(4) What we do is, the Mexico suppliers, obviously they visit our plant more often so they're able to look at the assembly process, their parts, how they're put together. So they have a better opportunity to bring us potential savings. Other suppliers that are in Europe, in Asia, wherever, they don't visit too much. So, really they only know their part, they don't know the rest of the facility. So, I think, by having them come here, we learn from them. .... Well, again, the local Mexican supplier is the expert in their product. If they make plastic parts, they make plastic parts.

So they are the best at that and that's what we learn from them. So I'd say we learn from their product knowledge.

(5) Of course we learn, we learn from their mistakes so we see how to avoid them, because we all have suppliers; to them we are customers, to someone else we are also customers. So, we see what kind of mistakes they are doing, we try to fix them, but we also learn what not to do. We also learn from the good things; I mean, like they implement something in their process, that's why we visit them, we want to see what kind of improvement they're making so we can maybe take a ....

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Exhibit 14 Response to the question : To what extent does your plant learn from local Mexican suppliers? And what does your plant learn from local Mexican suppliers?

Purpose: To determine the extent of learning and the content of learning of maquila plants from local Mexican suppliers (Maquila plant).

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*People commonly think local Mexican suppliers learn from maquiladora plants, but your opinion is, maquiladora plants also learn from local Mexican suppliers? (Interviewer):* We also learn from them. *What does your plant learn from local Mexican suppliers? (Interviewer):* Nothing specific comes to mind but we do learn something specific. *The technology, management, financial, primarily? No? (Interviewer):* Maybe in technology and management. Looking at their processes, there are some processes that we have implemented here, like laser .... So looking at them, looking at their capabilities, we now also have those types of properties here.

(6) Zero, ha... I mean I think there is one company, this packaging company you know; they help us, so I think to some extent we learn from them, but fairly low. *What does your plant learn from local Mexican suppliers?(Interviewer):* Well I think packaging techniques and things like that, they help us with how to package some things, that's pretty much it.

(7) This plant learns social networking for more business from local suppliers. This characteristic – social networking is very strong here, a kind of culture in this region. In the early days of the business, sales were difficult because we were not familiar with local culture. Additionally, the technical side is weak for learning from local suppliers.

(8)At this time, I'm going to have to say we have not really learned a lot from our local suppliers because we are considered a high tech business. We have clean rooms which require a lot of technical items. So, our suppliers, from a high level, have not been able to come in and help us. They are able to give us the basic needs we have, you know, fulfill our basic needs, from that standpoint. There are some that are starting to elevate themselves to where they can be an asset to us as a supplier, but right now....We are pulling our suppliers, rather than pushing us, right, we are pulling them. We are trying to help them become, come out of a lower level supplier into a preferred supplier, an excellent supplier, a world class supplier. *Next question, what have you learned from local Mexican suppliers? (Interviewer):* As I stated earlier, our tooling machine shops in Reynosa have come up. *What is the reason, the specific reason? (Interviewer):* For machine shops? I mean everybody needs expert tooling, primarily tooling. So with the assistance of our plant we've been able to elevate them to a higher level, which, in turn, they have more knowledge and understanding of the higher tech industry. So they're able to come to us with new ideas and help us solve our tooling requirements. Other than that, it's more of just a buyer-seller relationship with our suppliers.

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Exhibit 14 (continued)

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For the learning of maquila plants, there is an interesting point. Overall, maquila plants transact with various sized and types of suppliers. In this research, as presented in the previous chapter, the sample of local Mexican suppliers also shows this varietal characteristic. Though a local, small sized Mexican company, its percentage is the highest, but there are various types and

sizes of companies. In regards to the comments about the size of local Mexican suppliers, maquila managers commented on doing business with various sizes of local Mexican supply plants as well as local small Mexican suppliers. Similarly, maquila plants do business with various types, various sizes of local Mexican companies, as well as smaller local companies. Therefore, maquila plants may have the opportunities to learn from these various sized or types of local Mexican suppliers. Exhibit 15 presents the variety of characteristics of local Mexican suppliers to transact with maquila plants.

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(1)*You mean, your local Mexican suppliers vary in size, right?* (Interviewer): Local suppliers are sometimes very big, and sometimes small size company, right. .... big one, I mean they invest I think ... really committed to capability and their training ... they also invest in R&D and they invest in technology ...

(2)*My question is the local Mexican suppliers, various sizes, types. I mean, actually, small local companies where the other local Mexican suppliers are big Mexican companies. Having some ranges in Mexico, big Mexican companies and local ...*

(Interviewer): Yes, our plant has 9 or 10. In Mexico City, Queretaro, Chihuahua, Reynosa, we are big, right. *So are local Mexican suppliers various sizes and various types?* (Interviewer): Yes.

(3)*How about the percentage of local Mexican suppliers, big Mexican companies, small Mexican companies?* (Interviewer): What about them? I'm not sure I understand the question. *So, local Mexican suppliers are equal, famous Mexican companies? And some companies are small sized companies?* (Interviewer): Yeah, we try to partner with established companies. There will be times when we need to partner with a smaller supplier, but we generally try to stay with the well established companies that have been in Reynosa for a period of time.

(4) I understand suppliers, various types of suppliers, so local small companies, and big Mexican companies. So, various suppliers, various Mexican companies. Maybe in technology and management. Looking at their processes, there are some processes that we have implemented here like laser .... So looking at them, looking at their capabilities we now also have those types of properties here. *I guess those Mexican suppliers are big Mexican companies right?*

(Interviewer): No, one of them is already gone. *So local small companies?* (Interviewer): Yes. (Continued on next page)

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Exhibit 15 Maquila respondent's comments about the size and the type of local Mexican suppliers (Maquila plant)

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*(5) Yes, so the local Mexican suppliers are commonly small size companies?*

*(Interviewer):* Well the ones for Reynosa, it's hard for us to say, I think relatively speaking are small and the ones we've met in Monterrey, relatively speaking are smaller companies. I'm sure Mexico has bigger companies; you know where the automotive center is closer to Mexico City, but in Reynosa and Monterrey, there are not so many big companies.

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Exhibit 15 (continued)

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Maquila plants learn various factors from local Mexican suppliers. Especially local adaptability, improvement of the process and product knowledge (or expertise) are relatively more frequent answers. Local adaptability is related to reverse knowledge spillovers; this means learning local markets and institutional relationships from local partners. This content of learning is applied in the sample of local Mexican suppliers and maquila plants, especially as maquila plants' entrepreneurial activity is primarily the improvement in the manufacturing process. Therefore, for the existence of learning of maquila plants and the learning content of the improvement of the process from local Mexican suppliers, the capability development of local Mexican suppliers can be thought of as being related to the entrepreneurial activities in the maquila plants.

In this research, though there are no direct interview questions about the second proposition, with the interview data from this research - especially for the learning extent and contents of maquila plants - the capability development of local Mexican suppliers can affect the entrepreneurial activities in the maquila plants positively. However, comparing the extent of learning with that of local Mexican suppliers, the strength of the effect seems to be weaker than the reverse case. Overall, in this aspect the second proposition is but partially supported.

**Proposition Three :**

**Governance structure between maquila plants and local Mexican suppliers and local embeddedness of maquila plants moderate the relationship among entrepreneurial activities in maquila plants and capability development of local Mexican suppliers**

This proposition is related to test the moderating role of (1) governance structure between maquila plants and local Mexican suppliers and (2) local embeddedness of maquila plants for the relationship between the entrepreneurial activity in the maquila plants and the capability development of local Mexican suppliers.

**The effect of transactional characteristics between maquila plants and local Mexican suppliers on the relationship among entrepreneurial activities in the maquila plants and capability development of local Mexican suppliers**

*Maquila plant responses.* For the question, “Is the transactional characteristic between your plant and local Mexican suppliers related to the effects,” two maquila plants (22%) answered yes. Four maquila plants (44%) answered no. Two maquila plants (22%) answered that they are not sure. Therefore, maquila plants that answered no are more frequent than maquila plants that answered yes. However, the answer no is difficult to be considered a strong answer. Overall, it is a mixed result.

*Local Mexican supplier responses.* For the question, “Is the transactional characteristic between the maquila plant and your company related to the effects,” among eight suppliers who answered that there are entrepreneurial activities in the maquila plant, only one supplier (12.5%) answered yes. Two suppliers (25%) answered no. The remaining suppliers (62.5%) skipped the question or expressed I do not know. Response rate is low. For this question, the interviewees

did not suggest the exact the reasons. The “No effect” answer is a little more frequent than the “effect” answer. However, it is the mixed result.

Additionally, RAMMAC director comments that transaction types between maquila and local Mexican suppliers has a positive effect on the relationship between the entrepreneurial activities in the maquila plants and the capability development of local Mexican suppliers, because inventory or technology increases the operation.

**The transaction type between maquila plants and local Mexican suppliers.** For the effect of transaction type between maquila plants and local Mexican suppliers on the relationship between entrepreneurial activities in the maquila plants and capability development of local Mexican suppliers, general transaction type characteristics and its impact is necessary to be explained for the understanding of the proposition result.

To determine the transaction type between maquila plants and local Mexican suppliers, the items of governance structure (Gereffi, Humphrey & Sturgeon, 2005) were revised and tested. The interviewer asked the interviewee to select one among five transaction types that is the most similar to that of the company.

- (a) Our company and the plant sell and purchase products or services by price in market. There is little interaction beyond transacting products or services for money.*
- (b) Our company tends to take full responsibility for process technology and often uses generic machinery that applies investments to a wide customer base. Our company satisfies with specific demands of the plant through codificative schemes in design and production. The cost of changing suppliers is low. There is little asset-specific investment that our company and the plant can use just for each other.*
- (c) Our company and the plant have a mutually dependent relationship based on trust. This mutually dependent relationship took a long time to be formed. The cost of changing suppliers or rebuilding trustworthy suppliers is high. There is relatively much asset-specific investment that our company and the plant can use just for each other.*

*(d) Our company depends on the plant. There is an unbalanced power relationship between our company and the plant. The plant monitors and controls the operations in our company. The cost of changing suppliers is high. Our company is specific by or to the plant.*

*(e) Our company and the plant transact inside a single firm. Our company is managerially controlled.*

Market is operationalized (a), modular is (b) relational is (c) captive is (d) and hierarchy is (e).

**Maquila plant responses.** For the question of transaction type between maquila plants and local Mexican suppliers, (C) relational governance structure or transaction type is the most frequent. Six maquila plants (46%) answered as relational governance structure. The second frequency is (B) modular governance structure, three maquila plants (23%) answered. The third frequency is (A) market governance structure, two maquila plants (15%) answered. The fourth frequency is (D) captive and (E) hierarchy governance structures, in each, one maquila plant (7.7%) answered. Especially in (E) hierarchy governance structure, the answer seems not clear, and the interviewee seemed to have misunderstood. Exhibit 16 is the answers of maquila plants.

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(1) I guess a combination. Our plant and local Mexican suppliers sell and purchase products or services based on the price in the market. The price in the market is an important part. But, also, we don't necessarily buy because of the best price. After the process of selection of our plant suppliers, then price is not key and flexibility becomes important. Also, Local Mexican suppliers take full responsibility for process technology. I have some examples of special materials. Furthermore, the cost of changing suppliers is very costly, not necessarily in the money but in the process of selecting, developing and transacting (totally establishing) with suppliers. So, we don't change suppliers, we don't change asset-specific investment, again, local suppliers are special investments for the purpose of local suppliers satisfying the demands of our plants production. Most of the skills that suppliers need, our plant provides, and what is required is primarily based on the customers' needs. Our plant and local Mexican suppliers have a mutually dependant relationship based on trust. Mutual dependence is developed over time. (Continued on next page)

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Exhibit 16 Response to the question : What is the transaction type between your plant and local Mexican suppliers?

Purpose : To determine transaction type or governance structure between maquila plants and local Mexican suppliers (Maquila plant).

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This needs a processing period like the certification of our plant suppliers and includes a lot of trust. This is related to high supplier development.

Local Mexican suppliers depend on our plant. For the unbalanced power relationship, our plant takes very good care of suppliers who invest a lot technology in the supplier base.

I don't understand this question exactly. *I mean, suppliers can be a division in your company (Interviewer)* No. *Suppliers may be internal division (Interviewer)*: No. Local suppliers, are, *Different company (Interviewer)*: Correct.

(2) Because some of our suppliers, company, some dependent and some are completely independent. So I cannot say that all are. It's like A, it's C. I think B and C. I say there are two. *You mean, characteristics of transaction or transactional type or transactional characteristics, B and C both, right? (Interviewer)*: Some suppliers are completely dependent on us because they manufacture only for us. *Very dependent (Interviewer)*: If we go bankrupt they go bankrupt with us. *It is like a family (Interviewer)*: Right. They are completely independent (They had all the side, R&D, production line, everything they cost inside plant). They have capability by themselves or independently because it is a big cooperation. So, I think two.

(3) C or E. Once this plant purchases the materials, the transaction must continue. Characteristics of the auto industry support this transaction. For E, after the choice of supplier, the change is difficult. So, the suppliers try to have the power for the transaction. The reaction of the plant is weaker. However, suppliers are still under control.

(4) I'd say B. Well basically, if I understand it here correctly, our purchasing group selects a supplier from a ... process. So once the supplier is producing products for us, they run their own business and they take full responsibility. The plant here doesn't interact really closely with the supplier after production begins. They manage their own business. Hopefully, they'll have many other customers, not just our plant. So, our plant is a piece of their business.

(5) I'll say we are more at B. In most of the cases with the Mexican suppliers that we're working with we offer them the ..., we give them the support, we supply the ... to make our parts. So, I haven't heard of any specific machine that the supplier needs to buy to support our operation. There may be some chips or small ... needed to support us but not like a whole investment based just on our operations. So they can always support more customers, not necessarily automotive, maybe another area. So machinery is not specific for us, or maybe it is, but it's not like the whole investment of the plant is not based on our department.

(6) Well we only have one supplier right now, so our packaging supplier is close to B because they do a lot of unique stuff for us, you know, because packaging requirements change or you try to improve it, so they do a lot of modifications for us and you know... It's for process technology & they use.... There's little asset specific investments, that's true. They take responsibility for the technology... I mean that's pretty much what we're using them for.

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Exhibit 16 (continued)

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And they supply specific demands about plans to scheme and design. I mean that's basically what they're doing for us. I still say b so...

(7) Probably C. In the transaction with local Mexican suppliers such as stampings or tools, the work process is long and hard. So, it is based primarily on trust.

(8) Mostly C. Suppliers are like special parts of maquilas, big company. It can be similar to twins.

(9) I would say letter A. *Explain in detail, why number A is most close? (Interviewer):* 90% of our business is buy and sell. They offer a service and we buy it; they offer a product and we buy it. So that's 90% of the business. *But I know some plants emphasize long close relations with suppliers? So some plants they.... Letter ( c ) Our plant and local Mexican suppliers have a mutually dependent relationship based on trust. But yours is number a? (Interviewer):* Yes. I mean we have the mutual relationship with our suppliers. In some cases it's taken a long time to do it but in the economic times that we are in today, cost is a major factor. I can't sit and tell the supplier that I will be obligated to you for the next 10 years, I can't. Even though we've been together for 5 years and we've built this relationship. If I'm able to source the same product for a lower cost, obviously I'm gonna give that supplier a chance to meet or beat that cost. But I have to look at the overall impact to our business in Reynosa. *Number a, is.... Based on market price? (Interviewer):* Yes, unfortunately yes.

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Exhibit 16 (Continued)

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***Local Mexican supplier responses.*** For the question of transaction type between maquila plants and local Mexican suppliers, local Mexican suppliers showed (B) modular governance structure as the most frequent governance structure, that is, six local Mexican suppliers (35%) answered. The second frequency is (C) relational and (A) market governance structure, each three local Mexican suppliers (18%) answered. For the third frequency, two local Mexican suppliers (11%) answered (D) captive governance structure. Also, two local Mexican suppliers (11%) answered no category (i.e. The local Mexican suppliers are not included in any categories). One local Mexican supplier answered that I don't know or didn't answer (no information). Overall, local Mexican suppliers show more various categories of distribution than maquila plants. Exhibit 17 is the answers of local Mexican suppliers.



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(1)A. The relations between us and the maquila are to require and give service. The transacting period is long primarily because we need to follow maquila's requirements or needs. The price is the most important factor for the transaction.

(2) Mostly A. In the past, we sometimes give maquiladoras some technical information about metal, plastic and sometimes steel in order to find the solution for them. They have some requirement. Besides that, just selling them steel. Overall A is the most close though there is an interaction (or support) between us and customers.

(3) The answer is B. The customer develops the project. We will outsource all the materials, all the services, all the equipment requirements for development. Customers check punctuality and quality through meetings or sessions and finally check whether the requirements are achieved well or not through some tests. The customer depends or relies on us to be competent that we will deliver the time, cost and punctuality project.

(4) B. We do consulting services for environmental health and safety. We visit plants and have high responsibility for customers. We don't change customers frequently, and the period is relatively long.

(5) B. Overall when customers ask to set up the RACK for the warehouse, we provide the service to customers with the engineering processes such as the calculation for set-up.

(6) B. We provide services after receiving the specifications about customer needs and do the related investigations (kind of preparation - time or production of product pieces).

(7) B. We worked with maquiladoras for more than eight years. And sometimes we worked with one or two more than anything because we wanted the correct quality. Quality is a good connection. We give one hundred percent of everything. More than that, we don't work with too many companies because we want to finish the work completely and that's fine.

(8) C. The trusted relationship between this local Mexican supplier and maquila plant. If a maquila plant comes to know the benefits of Mexican suppliers rather than a U.S. company or supplier, trust between this supplier and maquila plant occurs like family. The transaction period between this supplier and maquila is long. If maquilas transact with local Mexican suppliers especially located in Monterrey and come to know the benefits of fast service (e.g. delivery), the trust occurs between Mexican suppliers and the maquila.

(Continued on next page)

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Exhibit 17 Response to the question : What is the transaction type between your plant and local Mexican suppliers?

Purpose : To determine transaction type or governance structure between maquila plants and local Mexican suppliers (Local Mexican supplier).

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(9) Probably C, my company and customer have a mutually dependant relationship based on trust. This depends on the length of the relationship. The customer changes the suppliers by rebuilding trust. As a result, my company and the plant make relatively much asset specific investments. Furthermore, the certification (ISO) is required. A relatively long transaction time is general.

For example, we have a ten year transaction with one primary maquila customer.

(10)D. We highly (high percentage) depend on primary maquila plants.

(11) None of the above (questions) is applied to whatever they do. Because of what we do there is lot of communication between us and customers and the company, and that's primarily what we do whenever we need something; the customers come and some you know, and we help each other out.

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Exhibit 17 (continued)

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In summary, for governance structure or transaction type, maquila plants show the relational governance structure as the highest frequency and the modular transaction type as the second frequency. On the other hand, local Mexican suppliers show more various transaction types rather than maquila plants. However, the modular transaction type is the most frequent governance structure and relational and market type is the next level of frequency. Captive transaction type is the fourth frequency. For maquila and local Mexican suppliers, modular and relational are the strongest governance structure. Market and captive governance structures are the weaker type. In other words, network governance structure is a stronger phenomenon than market or hierarchy.

#### **The effect of transaction type on maquila plants and local Mexican suppliers**

*Maquila plant responses.* For the question, “Does this transactional characteristic affect the business of your plant”, four maquila plants (44%) answered yes and four maquila plants (44%) answered no. For sample maquilas, the effect of the transaction type or governance

structure in the business of maquila plants is the mixed result. Exhibit 18 is the answers of maquila plants.

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No

(1) Investment self. Our growth is primarily related to the investment and transaction of ourselves.

(2) No, it doesn't because as long as they support me and they don't leave me behind because they have another customer, it doesn't affect me.

(3) I don't think so, the only thing is that, since they are responsible for the process, it's one less thing we have to worry about right? I mean for us it's good, it's been a beneficial relationship for the company. They're very professional about it; they take care of our needs so it's one less thing we have to worry about. Packaging is very important because you have to ship it correctly.

Yes

(1) Yes. Sometimes. Let me tell you one example. And now our sales went two double. We have a hundred percent increase in our sales and we didn't expect to have so many sales in this area specially because of the recession. .... situation of the market. And what happens is that all the plants are dependent on us. They are unique for our plant that only one let them supply materials to us. They don't have enough capacity. I mean double the sales, what happened? We need to join developing working suppliers to support the sales increase and I think I mean that kind of transaction where we have to think of the vendor... I think that kind of transaction is... really good. No when you don't know their future. what has happened in maquilas this year in the economy is that we expected a 30% decrease in sales and what happened? So, what happened? ... we don't have capability or capacity to support the suppliers that we had so I don't think it is a good idea how people choose just one big corporation. I think that transaction ... probably not so good to have.

(2) Yes. if there are no materials from suppliers, business may not be possible.

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Exhibit 18 Response to the question : Does this transactional characteristic affect the business of your plant?

Purpose : To determine the effect of transaction type on maquila plant business (Maquila plant).

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For the question, "Does this transactional characteristic affect capabilities of local Mexican suppliers," also three maquilas (33%) answered yes. Three maquilas (33%) answered no. The

remaining maquilas (33%) didn't answer or they expressed I don't know. In the similar context of transaction type or governance structure, it is the mixed result. Exhibit 19 is the answers of maquila plants.

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### Yes

(1) Obviously so. I mean if I'm doing business with a supplier today and somebody comes in and offers me the same product for a lower price obviously I have to look at that. And so if my current supplier cannot match or beat that price then I have to make a decision on whether or not to transfer to the new supplier. And if I transfer to the new supplier, obviously its gonna have an impact on local suppliers. And the same thing, if I'm able to source a product, maybe not in Reynosa, but in McAllen, and its cheap enough so I can move it across the border and still save money, then that is going to impact the local people. *So those local Mexican suppliers make efforts for low price right?(Interviewer):* Yeah, I mean, we work with our suppliers and, again, we've established relationships with a lot of our key suppliers but in establishing a relationship we have to work with them to continually have cost reduction. I don't prefer a supplier that says "Today I'm gonna sell you this product for X amount of dollars" and expect us to be happy with that forever. I expect suppliers to come to me with solutions that will lower our cost but still provide me the same quality and product functionality.

### No

(1) I don't think it affects them. It gives them more chances to get more customers. Being someone who has engineering equipment gives them more chance to expand to other areas, to have more customers. And that's good for us because as long as they get bigger they get more financial resources and everything so that gives us more support, more confidence in the supplier.

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Exhibit 19 Response to the question : Does this transactional characteristic affect capabilities of local Mexican suppliers?

Purpose : To determine the effect of transactional type on capabilities of local Mexican suppliers (Maquila plant).

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***Local Mexican supplier responses.*** For the question, "Does this transactional characteristic affect capabilities of your company," six local Mexican suppliers (37%) answered yes. Seven local Mexican suppliers (43%) answered no. Three local Mexican suppliers (18%) didn't answer

or they expressed I don't know. It is a mixed result. Exhibit 20 is the representative answers of local Mexican suppliers.

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Yes

(1) Transaction type positively affects the capability of our company in a positive way. Get motivated to (or pushes us to) increase capabilities, and it makes us more efficient.

(2) Yes, close relationship with client.

No

(1) No. The relationship with many customers is primarily about the payment (or the ability of payment)

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Exhibit 20 Response to the question : Does this transactional characteristic affect capabilities of local Mexican suppliers?

Purpose : To determine the effect of transactional type on capabilities of local Mexican suppliers (Local Mexican supplier).

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Overall, the effect of transaction type between maquila plants and local Mexican suppliers on the business of maquila plants and the capability development of local Mexican suppliers is a mixed result in the sample maquila plants and local Mexican suppliers.

For proposition 3-1, hierarchical governance structure is (E) in this research, but no local Mexican suppliers answered (E) hierarchical category. Only one maquila plant answered (C) or (E) as the transaction type. This maquila plant answered that this transactional characteristic affects the capabilities of local Mexican suppliers. However, the (E) hierarchy governance structure answer seems not clear; the interviewee seemed to have misunderstood. Finally, for the sample, hierarchical governance structure is not a strong phenomenon for the local Mexican suppliers or maquila plants that answered hierarchical (furthermore captive) governance structure; the effect on capability of local Mexican suppliers is not clear.

**The effect of the commitment of maquila plants to local community on the relationship among entrepreneurial activities in the maquila plants and capability development of local Mexican suppliers**

*Maquila plant responses.* For the question, “Is the commitment of your plant to the local community related to the effects?”, three maquila plants (33%) answered no information or that they are not sure. Only one maquila plant (11%) answered yes. The maquila comments that they try to provide the best environment for their workforces. However, it is doubtful that this maquila interviewee understands the question exactly. The interview question is related to entrepreneurial activities in the maquila plants and capability development of local Mexican suppliers. His answer seems to be a general comment about the maquila employees. On the other hand, five maquila plants (55%) answered no. Overall, maquila plants answered that the commitment of the maquila to local community is not related to capability development of local Mexican suppliers.

*Local Mexican supplier responses.* For the question, “Is the commitment of the maquila plant to local community related to the effects?”, among eight local Mexican suppliers who answered that there are entrepreneurial activities in the maquila plant, four local Mexican suppliers (50%) answered the question. The response rate is not high. Just one local Mexican supplier (12.5%) answered yes. The local Mexican supplier comments that sometimes this local Mexican supplier sponsors the maquila’s commitment to the local community (e.g. football team). However, it is also doubtful that this maquila interviewee understands the question exactly. This question is related to entrepreneurial activities in the maquila plants and capability development of local Mexican suppliers. Three suppliers (37.5%) answered no. Overall, local

Mexican suppliers also show no effect of the commitment of maquila plants to the local community related to capability development through entrepreneurial activity.

**Commitment of maquila plant to local community (or contribution to the development of local community).** For the effect of the commitment of maquila plants to the local community on the relationship between the entrepreneurial activities in the maquila plants and the capability development of local Mexican suppliers, general information about the commitment of maquila plants to the local community and its effect on the capability of local Mexican suppliers or the business of maquila plants is necessary to be explained for the understanding of the proposition result.

*Maquila plant responses.* For the question, “To what extent does your plant commit to the local community or contribute to the development of the local community?,” one maquila (11%) answered very committed. The remaining eight maquilas (89%) answered committed but no comment of the extent. Overall, all maquila plants answered that they are committed to the local community.

The primary contents of commitment to local community are school donation, environmental event, medical services and other social activities. Six maquila plants answered that they donated to schools and two maquila plants answered job creation (local employment). These are frequent contents of commitment to local communities. Exhibit 21 presents the contents of commitment to the local communities of maquila plants.

For the question, “Does the commitment of your plant to the local community affect the business of your plant?,” four maquilas (44.44%) answered no, two maquilas (22.22%) answered that it had a positive effect, three maquilas (33.33%)’ answers are no information or missing data.

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(1)Developing regional industry and regional suppliers is an important part for the development of local community. In our plant, there are the related committees and programs. We donate funds, give workshops and technology to schools (including universities).

(2) This question is a really good question. Our plant is very committed. Our plant is participating in every single event from government. Here people created a lot of jobs.

(3)The plant is committed to a community. This plant does various programs for the school for local people. This plant supports the school and has to get chairs for kids, to get the bathroom. This plant has them build a fence around school... So this plant has the community of the employee for a special day like an 'environmental day'. They plan the donation for the city. They plant trees...Also, there is a scholarship program for resources and employees.

(4)I cannot answer that question because it is for the lady of human resources. We have some plans for human resources and community but I'm not really sure what they are.

(5)Our plant provides funding for local schools, mainly public schools, elementary and preschool. And, does the commitment of your plant to local community affect..... We also fund medical centers so that people from our plant with a badge can go and buy medicine for less money and their families can also. And I think this commitment to help the employees be more careful will make them more dedicated to our plant. So that's what we think happens.

(6) We have several ways that we contribute to the community. We primarily focus on schools that are in need, and children who are in need. We made several equipment donations, to some of the local schools. We have made donations to the universities in Reynosa. We had charity drives to raise money for underprivileged children. We do volunteer work. Several years ago, there was a school that was pretty close to our facility and we went out on a weekend and we cleaned it up and we donated money to install bathrooms. We painted the school and painted the interior. So, those are the types of things. We have showrooms where the parents can bring their children and we'll give gifts and those types of things.

(7) We have some programs in the company like there are some committees and subcommittees that support the community, they donate things like old equipment to the schools, to the universities, and they donate money to some local schools. They collect things when catastrophes like floods or whatever happens in Mexico; we support the community. We have external associations to support the community. (Continued on next page)

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Exhibit 21 Response to the question : To what extent does your plant commit to local community or contribute to the development of local community?

Purpose : To determine the extent and the content of the commitment of maquila plants to local community (Maquila plant).

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(8)I maybe not be the right person to answer that because we have an HR, Manager, and our Mexican Plants can answer better. We may have activities involving the community, like sponsoring a garden and sponsoring activities for school children, but I'm not really involved personally so...

(9) Local employment.

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Exhibit 21 (continued)

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Overall, the commitment of maquila plants to the local community seems not directly related to the business of maquila plants (e.g. sales). The effect is primarily employee benefits, reputation and community development. Indirectly, this may affect the maquila business positively. However, the direct goal is not the business - like sales. Exhibit 22 presents the answers of maquila plant.

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(1)No. Sales increase is not related. Different interests. Those are the support of community and the protection of environment.

(2) Probably not. I don't think so. But in a positive way.

(3) I think it is affected positively. Our plant has a good reputation from it. I like the program of scholarship for resources and employees.

(4) *So, many local people want to work at your plant. How about sales? Sales is not related right? Local communities...* (Interviewer): In local communities, no. It does not impact sales because we have dedicated workforce. Partly, because of community involvement.

Not from a sales standpoint but from a workforce standpoint.

(5) It could impact the increase in sales but not really. If anything, it would have an impact of our plant being a preferred employer because people understand that we are trying to help the community. *Image?* (Interviewer): Right, image is it. (Continued on next page)

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Exhibit 22 Response to the question : Does the commitment of your plant to local community affect the business of your plant?

Purpose : To determine the effect of the commitment of maquila plants to local community on the business of maquila plants (Maquila plant).

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Because, people see our plant out in the community trying to help the community and then it makes people want to be part of that image. It's a good and strong image.

(6) It's just respect.

(7) I can't, I'm not the right person, If you really want to find out, you would have to talk to our Human Resource Manager at our plant.

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Exhibit 22 (Continued)

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For the question, "Does the commitment of your plant to the local community affect the capabilities of local Mexican suppliers?," eight maquila plants (88.88%) answered no. One maquila plant (11.11%) did not answer or skipped the question. No maquila plant answered yes. Therefore, maquila plants show that these commitments to local communities do not affect the capability development of local Mexican suppliers. Exhibit 23 presents the answers of maquila plants.

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(1) Not at all.

(2) I don't think so.

(3) Our plant does best for the local community so I guess the local community is also affected positively. At the question of the impact to local suppliers, I answer, 'No.'

(4) We promote it, we want Mexican suppliers. So, I would say that yes, our plant will support the Mexican suppliers wherever they can. I don't know that our commitment to the community is gonna help the supplier. So I'm gonna put no effect.

(5) I don't think it affects, maybe it doesn't do any better for them but it doesn't do anything.

(Continued on next page)

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Exhibit 23 Response to the question : Does the commitment of your plant to local community affect capabilities of local Mexican suppliers?

Purpose : To determine the effect of the commitment of maquila plants to local community to the capability of local Mexican suppliers (Maquila plant)

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(6) No, I think the activities of the companies, at least the one's I know about might have had a stronger impact with direct labor, Because, right now, employee turnover is really low, because of the economy, but up until a year ago, employee turnover was fairly high, 10 percent, 15 percent, you know maybe even higher, so you try to do things for the community that helps attract the employee, so most of our activity was to try and keep that nice environment for direct labor so that they don't quit, as opposed to, for example, I think we're thinking about the supply base.

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Exhibit 23 (Continued)

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*Local Mexican supplier responses.* For the question, "To what extent does the maquila plant commit to the local community or contribute to the development of local community," the remaining ten local Mexican suppliers (62.5%) did not answer or skipped the question. The response rate is not high. Six local Mexican suppliers (38%) answered yes or strong; that is, maquila plants are committed to the local community. Overall, the information from local Mexican suppliers is limited or indirect, but some local Mexican suppliers answered that their customer maquila plants are committed to the local community. The contents of customer maquila plants are similar to the answers of maquila plants. That is, they are school donations, medical services and social activities, etc. Exhibit 24 presents the answers of local Mexican suppliers.

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(1)Strong commit to local community; customer maquila provides medical service or food etc.

(2)Locally we have 29 customers. I can remember only three of them who committed to the community and the maquiladora plant, yes, only three of them. I remember, they committed themselves to having some ... external ... community social activity....

(Continued on next page)

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Exhibit 24 Response to the question : To what extent does the maquila plant commit to local community or contribute to the development of local community?

Purpose : To determine the extent of maquila plants' commitment to local community (Local Mexican supplier).

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*Small percentage (Interviewer):* Yes, I guess, famous company, right, world wide global company (Interviewer) yes.

(3) They do help people; they give food to people in the street, sometimes a special lunch or special breakfast for kids, or they let you know something about environment ...

(4) They usually have a lot of names on the company website because they have open tops. So pretty much before working here like local people, they give them jobs.

(5) Customer maquila plants also give many contributions, especially donations to local schools or universities (educational institutions).

(6) I know that the maquiladoras that I work for have older people, and they help them.

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Exhibit 24 (Continued)

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For the question, “Does the commitment of the maquila plant to the local community affect the capabilities of your company,” ten local Mexican suppliers (63%) answered no effect. The remaining six local Mexican suppliers (37%) did not answer or skipped the question. No local Mexican suppliers answered yes. Therefore, for local Mexican suppliers, the commitment of maquila plants to the local community is not related to capability development of local Mexican suppliers.

Overall, the local embeddedness of maquila plants is primarily for the benefits of employees. It seems to be originally because of lowering the turnover rate (especially for the effect of recession). Employees in maquila plants are primarily industrial people or employed in the local region. The benefit of maquila plants for employees is actually to lower the turnover rate but the effect is broader. That is, reputation or respect increases, job applications increase, and a better relationship with local government results. In particular, maquila plants participate in the local government’s regional (or economic) development programs. For example, maquila plants donate to universities. The direct effect on business (e.g. sales) is not the main goal, but this

commitment can be recognized as localization and bring benefits to the maquila. This characteristic of local embeddedness is currently not related to the capability development of local Mexican suppliers.

In conclusion, proposition 3, especially the governance structure part is not clearly decided as a yes or no result but a mixed result. The local embeddedness part is rejected (no relation). Proposition 3-1, hierarchical governance structure is not a strong phenomenon. Moreover, in the sample, hierarchical governance structure does not show the clear relationship for capability development of local Mexican suppliers. The commitment to the local community of the maquila plant is primarily for employee benefits. Currently the local embeddedness of the maquila plant as the commitment to the local community is not related to the capability development of local Mexican suppliers.

### **Additional Results**

In this dissertation research, except for the questions related to propositions, for the capability development of local Mexican suppliers, various questions were additionally asked. These results are related to the test of the propositions and give many other policy implications to capability development of local Mexican suppliers. Here, the results of other interview questions are summarized and presented.

#### **The Motive of Transacting with Local Mexican Suppliers**

**Maquila plant responses.** For the question, “Why does your plant transact with local Mexican suppliers,” nine maquila plants (75%) answered proximity and each maquila plant (8.33%) answered regional economic development, price and quality. Overall, maquila plants recognize proximity as the most important reason of transacting with local Mexican suppliers.

Furthermore, proximity seems to be a stronger motive than cheap price. Exhibit 25 presents the motives (or benefits) of transacting with local Mexican suppliers (including proximity).

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(1) First, because we are an important company, we are very interested in regional economic development. Second, as our strategy of becoming flexible, suppliers must satisfy customer's needs in the backdoor of supply chain.

(2) Overall transportation cost minimization.

(3) There is a localization Policy. This is a policy of our plant and it aims to do the sourcing near the manufacturing site. Electronics parts are delivered from Asia and Europe, but, for materials like metal stamping parts, we do the sourcing in this region. Localization means to be a part of region, nation and manufacturing plant.

(4) We have a price opportunity service, and because they are local.

(5) Obviously, the benefit of being localized is that they are near to us. *But many people thought the benefit is the proximity and low price (Interviewer):* More proximity than low price because a lot of our products are high automation, so there is little labor involved. So advantage per labor is now too significant. So really it's a proximity to suppliers.

(6) One is quality, two support, three we can reduce our inventory by having someone local. Also, the flexibility to make changes in the schedules since they are closer to our facility, we can change more. We can do more things, like I said, reduce inventory, do more .... Many things related to inventory and the flexibility and support from someone local.

(7) Well from the perspective of a packaging company, it's very good for us because it's close by our plant and they deliver their goods on a regular basis; they come several times a day and if there's an issue, we can go visit them or they can come to our plant very quickly, that's the big advantage. It's a real advantage to have that for packaging; it would be a real advantage for plastics too because you know somebody close by would be good, but you have to be qualified, you have to be willing to work in an automotive environment which some companies are not willing to do.

(8) Inventory management is very important to us. In detail, it is flexible management of inventory for adjusting the requirements of customers minimizing transportation cost. On the other hand, Asia or Korean suppliers are better priced.

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Exhibit 25 Response to the question : Why does your plant transact with local Mexican suppliers?

Purpose : To determine maquila plants' motive to transact with local Mexican supplies (Maquila plant).

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**Local Mexican supplier responses.** For the question, “Why does the maquila plant transact with local Mexican suppliers,” ten local Mexican suppliers (52.63%) answered proximity. Six local Mexican suppliers (31.57%) answered cheap price. Two local Mexican suppliers (10.52%) answered specialty in Mexican regulation. One local Mexican supplier (5.26%) answered good quality of product or service.

Overall, local Mexican suppliers also think of proximity as the most important motive for a maquila plant to transact with them. However, compared to maquila plants, local Mexican suppliers consider more various motives as important, such as cheap price and specialty in Mexican regulation. Exhibit 26 presents the answers of local Mexican suppliers.

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(1) Shorter lead time, lower freight cost, better response time.

(2) I guess the factor is convenient. You know, shorter turnaround time. Around the corner we're local, you know. We're a manufacturing industry we know don't lose money. You lose money when you have line go down .... So instead of, you know, having to wait for suppliers to ship you supplies in three, four, and five days or two or three weeks they got somebody local who says now, I got a number today, OK, we can put it in the machine, so I can have ... this afternoon or I can have ... single in the morning. It's more convenient, you know, it's right here. And of course, we take into consideration certain requirements based on the customers. Cause you know, what the customers know ... they can get labels cheap in Mexico because labels cost less but it's ... say goes we get ... So you know, a lot of factors it considers are quality, service, turnaround time. Those things they look at and so I mean as far as representative questions about why the plant transacts with local suppliers, it's just convenient. It's the manufacturing purpose.

(3) Well mostly it's because the expert about Mexican regulation that basically why do maquiladoras hire local companies. For federal purchase, what they pay that purchase is a very complicated issue.

(4) Benefits of cheaper price. (Continued on next page)

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Exhibit 26 Response to the question : Why does the maquila plant transact with local Mexican suppliers?

Purpose : To determine maquila plants' motive of transacting with local Mexican suppliers (Local Mexican supplier)

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(5) Because our principal material is that chemical... they have good quality and a good price.

(6) They work in Mexican maquiladoras because of the cost; they were really good in Mexican maquiladoras because of the cost.

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Exhibit 26 (continued)

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In summary, for both maquila plants and local Mexican suppliers, the reason both maquila plants and local Mexican suppliers transact is proximity. However, compared to maquila plants, local Mexican suppliers recognize more various reasons, especially cheap price and specialty in Mexican regulation. Maquila plants seem to consider proximity as more important than cheap price.

### **The Strength and Weakness of Local Mexican Suppliers**

In the similar context of the motive to transact with local Mexican suppliers, the interviewer asked the strength and the weakness of local Mexican suppliers.

**Maquila plant responses.** For the question, “What is the strength and the weakness of local Mexican suppliers,” for the strength, seven maquila plants (58.33%) answered proximity. This is the most frequent answer. Two maquila plants (16.6%) indicated strong commitment (partnership). The other maquila plant (8.33%) answered various reasons such as good technical ability, a high desire to succeed, and creative problem solving abilities (e.g. tool breaking issue in the maquila plant). Overall, proximity is recognized as the most important strength.

For the weakness, maquila plants answered various reasons. Two maquila plants (20%) answered limited selection - industry variety, lack of various industrial experiences and the other two maquila plants (20%) answered cultural factors (e.g. appointment delay or late response etc). The remaining maquila plant (10%) answered various weaknesses; limited selection - product variety - lack of technical capability for various products in the same industry, low level of



technology, quality, financial fragility, integrity and ethics, and communication failure. Overall, for the weakness of local Mexican suppliers, the first primary part is limited selection - lack of industry and product variety (technology and quality), the second primary part is culture and ethics. The remaining weakness is financial fragility. Exhibit 27 presents the answers of maquila plants.

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### Strength

(1) This plant is a lot more flexible for customers and a lot of times we have changed customers. It happened very often, but we can react very fast with local suppliers.

(2) When interviewee visited local Mexican suppliers, they had a pride that they are part of our maquila plant and had a fantasy that they could gross as much as a U.S. company because they supplied cheaper merchandise than Japan, Australia, and Europe.

(3) They seem to have good technical abilities.

(4) The desire to succeed is very high.

(5) Mexicans are very creative, and this creativity can help us mold the parts of our local suppliers in helpful way. For example, if a tool breaks they find a way to fix it and make it work, thereby avoiding downtime and issues with our customers.

### Weakness

(1) This region has not developed yet technologically in the level of providing all components. It focused on the components for specific products

(For example, our cell phone product was difficult because we had a hard time acquiring the components for a special phone type from local Mexican suppliers).

(2) Weakness, I would say that their automotive experience is low; they are more experienced with appliances and fabric. So I'd say less automotive experience. *So you say the automotive industry is not strong, I mean compared to Detroit (Interviewer): Yes.*

(Continued on next page)

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Exhibit 27 Response to the question : What is strength and weakness of local Mexican suppliers?

Purpose: To determine the strength and the weakness of local Mexican suppliers (Maquila plant)

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(3) Low level of technology. Most technologic parts are imported from overseas.

(4)The weakness can sometimes be quality, not all the time.

(5) And weakness. It's probably also related to supplier flexibility. It's really Mexican suppliers. They are not really committed. I think it is the culture. Mexican culture is the kind of person who would say, "we are going to have this material ready" but something happens and they don't deliver on time.... some, not all.

I cannot say that is a kind of weakness of commitment. I guess in some suppliers not all kinds of suppliers are related. We want deep suppliers committed with us to be one long relationship with us.

(6) I hate to use this word but, integrity and ethics. There needs to be ethics involved in the partnerships and honesty in the partnerships and no back door for business.

(7) Sometimes (Not all the times) a failure in communication. Very few times this maquila plant finds local Mexican suppliers available when this plant has an issue where it's hard to communication with them.

(8) Because of the financial fragility that a small company has, for the financial difficulties that maquila plants have in the economic crisis (or recession), local Mexican suppliers are difficult to endure and may go bankrupt.

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Exhibit 27 (continued)

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**Local Mexican supplier responses.** For the question, "What is the strength and the weakness of local Mexican suppliers," for the strength, seven local Mexican suppliers (35%) answered proximity and four suppliers (20%) answered cheap price. Three suppliers (15%) answered low cost for foreign company's investment. Two suppliers (10%) answered specialty in Mexican regulation and knowledge of their own country. The remaining suppliers showed various reasons.

For the weakness, three suppliers (17.64%) answered technology, two suppliers (11.76%) answered human resources (trained people), quality of product or service, price of product or service, limited selection / product variety, and delay of delivery. For the remaining suppliers, each supplier (5.88%) shows various weaknesses. Exhibit 28 presents the answers of local

Mexican suppliers.

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Strength

- (1) The advantage is close ... better service, lower inventory levels, transaction cost.
- (2) The product price is lower than U.S. compared to quality.
- (3) One strength is the peso lately versus the dollar and Euro. I would say that the strategic leveling of the peso makes Mexico very attractive to foreign companies who want to invest. Mexico has an advantage because of low cost. Mexico is logistically and globally positioned near the United States, one of the main markets in the world.
- (4) Knowledge of own country and Mexican regulations (or Mexican regulatory requirement or agency).
- (5) Strength is cheaper, we have high quality, with no cost of labor.
- (6) Update of the latest technology or processes to follow new investment of maquilas.

Weakness

- (1) Maybe we have no technology that we use. Other companies of other countries (e.g. the United States and Europe) have technologies. *Technology is low (Interviewer)*: In some cases, and talking generally, and because we do have some suppliers that have a lot of technology.
- (2) Employees' personnel experience, it is not easy to hire new employees for manufacturing or handling label machines.
- (3) Another weakness is that they don't have the product quality certified.
- (4) Weakness is the expensive price compared to service. When the customer's needs are not implemented or they need different things, later they come to recognize that they paid more compared to the received service.
- (5) Local suppliers in Mexico are small compared to the U.S.. So, inventory synergy is weak. That is, if customers want special types of products (raw materials), local suppliers in Mexico find it difficult to satisfy the requirements of customers.
- (6) Maybe they don't have good delivery time. This is a weakness. (Continued on next page)

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Exhibit 28 Response to the question :What is strength and weakness of local Mexican suppliers?  
Purpose : To determine the strength and the weakness of local Mexican suppliers  
(Local Mexican supplier).

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(7) Weaknesses in infrastructure like buildings, roads etc.

(8) One of their weaknesses is the Mexican government doesn't give support to Mexican product development. *Mexican government doesn't support (Interviewer):* They don't support but instead give more credibility to American products than Mexican products. Here it's been getting better, but you know we are so corruption in Mexico. It's actually not everything in the government. However, there is the atmosphere to give and receive the bribe type money as commission.

(9) Competition among suppliers increases because of the customer's cost reduction effort in recession.

(10) I would mean ten different taxes that we pay and about six of them are something you would not find in another country.

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Exhibit 28 (continued)

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In summary, for maquila plants and local Mexican suppliers, as a strength, proximity is both the highest and the most frequent. Cheap price or low cost to foreign company investors is the primary answer, just from local Mexican suppliers. As a weakness, maquila plants first answered on the technical side and second on the cultural and ethical side and the third on financial fragility. However, most answers about weakness are common or duplicated compared to maquila plant's answers but local Mexican suppliers answered more various weaknesses such as human resources (trained people) and quality or price of product (or service) etc.

### **Capability Development of Local Mexican Suppliers and Opportunity and Threat to Local Mexican Suppliers with the Upgrading of Maquiladora Industry**

This part is about the capability development of local Mexican suppliers with the upgrading of the maquiladora industry. The upgrading of the maquila industry means the increase in technical intensity and capital intensity for that time. Also, capability in the capability development of local Mexican suppliers means primarily technological capability and partly managerial capability. Financial capability is not strong.

**Maquila plant responses.** For the question, “There has been a large amount of investment in the maquiladora industry. Do you think the capabilities of local Mexican suppliers have actually increased with the investment?”, eight maquila plants (88%) answered yes. One maquila plant (11.11%) answered not sure. According to up and down investment and employment resulted from economic cycle in the United States or on the border, the maquila interviewee is not sure that local Mexican suppliers have developed their capabilities. However, overall almost all maquila plants answered that the capabilities of local Mexican suppliers have actually increased with the investment in the maquiladora industry (i.e. the upgrading of the maquiladora industry). Exhibit 29 presents the answers of maquila plants.

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(1) Absolutely Yes. Yes. Capabilities of investment of local suppliers are increasing as business continues to grow.

(2) Yes. Absolutely. .... I think so. (There are a lot, I mean suppliers, of course)

(3) 4 years ago, there was a huge economic boom in this area. For example, there is an industrial park across the streets that was developed around that time and there were a lot of investments by then and actually a lot of people who worked ... left seeking opportunity to work in a new company in Reynosa. 4-5 years ago, we had a lot of new investments; we hired people from a lot of places. We were bringing people from 50 miles away because we could not find people here. Currently I would say every local plant in the city is reducing ... So I'm not sure if some Mexican suppliers have the opportunity to increase their capabilities with investment because from last year to today the economic situation has impacted everybody in this region, in my opinion.

(4) Yeah I think so. I mean, there are many ways to invest. One is the people and one is equipment and the facility. So, as people invest in automation, then yeah they are gonna become more technical. (Continued on next page)

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Exhibit 29 Response to the question : There has been a large amount of investment in the maquiladora industry. Do you think that capabilities of local Mexican suppliers have actually increased with the investment?

Purpose : To determine the capability development of local Mexican suppliers with the upgrading of maquiladora industry (Maquila plant).

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(5) Yes, I have to say there have been some developments. I would assume, that in the automotive industry there has been more investment, better absorption, as we discussed earlier and technology improvements from that side. But still, I'm just basing the information on the suppliers that I'm dealing with.

(6) As long as there's more investment in the maquilas, it's more beneficial for them because they will be able to send more parts.

(7) I think so, I mean not related to suppliers the city of Reynosa in general if you look at it now versus 10 years ago, there are many improvements right? The roads are better, the stores are better. It seems like the whole city is affected by the maquila industry, how it really affects the specific supply base, it's hard for me to say since we don't have any Mexican suppliers. People I talk to all work for U.S. based companies.

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Exhibit 29 (continued)

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For the question, "What are opportunities and threats to local Mexican suppliers," all nine maquila plants answered there is opportunity. Eight maquila plants (61.53%) answered more business with maquila. Five maquila plants (38.46%) answered increasing capabilities (or investment) opportunity. For the threats, four maquila plants (44%) answered and five maquila plants (55%) didn't answer or skipped the question (no information). For the threats, the response rate is not high. Two maquila plants (40%) answered the economic crisis and the each other maquila plant (20%) answered various reasons - corruption, foreign supplier, and difficulty deciding the contract period resulted from the lack of the business experience. Exhibit 30 presents the answers of maquila plants.

**Local Mexican supplier responses.** For the question, "There has been a large amount of investment in the maquiladora industry. Do you think the capabilities of local Mexican suppliers have actually increased with the investment," eleven local Mexican suppliers (68.75%) answered yes. Two local Mexican suppliers (12.5%) answered no. For the local Mexican suppliers who answered no, one local Mexican supplier answered that because of a lot of corruption,

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### Opportunity

(1) Local suppliers can do more business and grow through investing.

(2) Because of high production costs, plants move to Mexico (Reducing their manufacturing cost) and bring those processes to Mexico.

Therefore, they may find local suppliers related to low cost or low production cost.

-Starting to see a trend back- a few years ago, trend to go to China. Now, stopped or slowed down. Some are coming back. Mexico is a good strategic position. The labor force is dedicated, educated and cheap. In Mexico, there are many automotive agreements with other countries around the world for trade. If Mexico produces their parts in Mexico, it gives the opportunity to the local suppliers.

### Threat

(1) The unsecure economic environment from the global economic crisis. Companies may have to cancel investments or lose business opportunities for the lack of capital.

(2) The primary threat is an economic downturn. Furthermore, local suppliers' financial ability is low (that is, they survive with a limited cash flow). They don't have any financial backing to get them through an economic downturn. Also, related issues are industry knowledge and keeping up with technology. But for this capability, financial ability is important or key.

(3) There is another threat. It is related to local people in Reynosa. There is corruption there that is starting to impact the suppliers because they are having to pay money to stay ahead. So that is a constant threat, not only to the small people but to the large people also. Interviewee hates to mention that but it's a fact of life.

(4) However, foreign suppliers are a threat to local suppliers. For example, Motorola extends their business here and consolidates the plant. Motorola suppliers like the U.S. may enter and do business in this region. Some foreign companies that produce in China may be threats.

(5) The difficulty is to decide on a contract period because of a lack of investment experience for local Mexican suppliers.

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Exhibit 30 Response to the question : There has been a large amount of investment in the maquiladora industry and what are opportunities and threats to local Mexican suppliers?

Purpose : To determine the opportunity and the threat to local Mexican suppliers with the upgrading of maquiladora industry (Maquila plant).

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especially in the department of maquiladoras, the capabilities of local Mexican suppliers did not increase. Three local Mexican suppliers (18.75%) answered that they are not sure. One local Mexican supplier (who answered not sure) answered that the number of local Mexican suppliers increased but their service scopes are limited. The other local Mexican suppliers answered that though opportunities increased, dependence from foreign technology or methods also increase. So, the interviewee is not sure of the capability development of local Mexican suppliers. For example, there were many small grocery stores in Mexico before, but recently most of them were changed into Seven Eleven stores. This means the following: that is, new methods or technologies brought by the international firms may be far more advanced than local suppliers are and as a result inhibit local suppliers to compete in their own local market. Additionally, over reliance on foreign methods and technologies may suppress innovation and creativity of local suppliers (One local Mexican supplier interviewee, personal communication, October, 2009). The other local Mexican supplier interviewee answered he is not sure. That is, the interviewee does not admit the qualitative change with the upgrading of maquiladora industry. Although maquilas brought more technology many are in the assembly stage from his sales experience. So, the interviewee commented that he is not sure of the capability development of local Mexican suppliers. Exhibit 31 presents the answers of local Mexican suppliers.

For the question, “What is the opportunity and the threat to local Mexican suppliers,” thirteen local Mexican suppliers (81.25%) answered there is opportunity, one local Mexican supplier (6.25%) answered there is no opportunity. Two local Mexican suppliers (12.5%) did not answer or the answer is missing data.

For the opportunity, twelve local Mexican suppliers (63%) answered that according to a growing demand by maquilas, additional revenue streams and business opportunities arose.



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(1) Yes. *Can you explain in detail?* (Interviewer): Well. I mean I cannot speak about other Mexican suppliers, but investment in automation and higher technology increased capabilities ... productivity. *Your answer is recently in maquila plant, maquiladora industry is there are much investment, automation, accordingly, as a result, related local suppliers their capabilities increased. This is your answer. Right?* (Interviewer): Oh, do I think that local suppliers increased ... because... Well, yes, to some extent, I mean still lack of supplier base, for sure, but, you know, I mean ... capabilities of suppliers in this area have grown as the maquiladora industry has grown as well. *Accordingly capabilities of local suppliers increased* (Interviewer).

(2) I think, capabilities...investment yeah, I guess, I have. *Yes. can you explain in detail* (Interviewer): You know, they put money into their facilities...push us to upgrade the technology, ... mention as far as work goes I don't see that any increase in business wide But as far as capabilities it has pushed just but I mean I am not sure you know. I am not sure exactly. *This company started in the early 90s. So, about fifteen years ago. So, in the beginning, and fifteen years you are primary maquila plants, increased investment, plant automation ... accordingly the capabilities of your company increased or changed?* (Interviewer): Yes. They have increased yes, I guess you can say over that time frame. Yes, over fifteen years. The investments surely have increased our capabilities. So, yes, it has you know ... for we can only do three colors, three color labels, now we can do ten color labels. You know, before, we would .... printing plate. Now we do ...printing plate we have equipment we buy we offer mix. Yes, we certain things yes have push this. To a maquiladora industry yes have pushed this to increase the capabilities, *suppliers* (Interviewer): yes.

(3) Yes (It's because) the more clients, more maquiladoras, more pesos, more products they have, it's more for them between more clients and more money.

(4) Yes. As the investment increases, the capacity of the services provided to each supplier increases too.

(5) Sometimes, yes, this supplier gets the job from maquilas. It helps this supplier in the investment.

(6) Yes, I believe so, with each new customer, there are always new requirements to comply with and we firmly believe in profitability through compliance. Our capabilities as a company are constantly increasing through continuous improvement initiatives, which in many cases are driven by our customers. (Continued on next page).

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Exhibit 31 Response to the question : There has been a large amount of investment in the maquiladora industry. Do you think that capabilities of local Mexican suppliers have actually increased with the investment?

Purpose : To determine the capability development of local Mexican suppliers with the upgrading of maquiladora industry(Local Mexican supplier).

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(7) Yes, because our company is growing and has more rights.

(8) I am not sure because the number of suppliers increased but there is still limitation of the scope of service.

(9) Negative answer. Because of corruption, we cannot provide to many maquila plants. Because of the corruption in the (purchasing) department of maquilas, we can provide the service to a small number of maquilas.

For example, suppliers suggest 10 pesos about a product, but the maquila said it was too expensive and returned the product. However, the third company comes and buys 10 pesos and sells 20 pesos to the maquila. Why, because the company and maquila are corrupted. If the maquila purchasing people bought in twenty dollars, they might have received 5 dollars as a bribe. This is a system or channel problem.

(10) Though opportunities increased, the interviewee is not sure. I am not sure that with more business opportunity, the capability of local Mexican suppliers actually increased or not. (This is about a kind of system and this is related to maquilas). On one hand, there are local suppliers who receive benefits, and on the other hand, there are suppliers (companies) whose sales decrease. For example, there were small grocery stores before, but recently many seven elevens dominate. In this way there is a disadvantage to local suppliers for this type of investment.

(11) I am not sure. That is, overall I don't admit the qualitative change with the upgrading of the maquiladora industry. Though maquilas brought more technology, many maquilas are still at the assembly stage from his sales experience of maquilas. So, I am not sure of the capability development of local Mexican suppliers.

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Exhibit 31 (continued)

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This is the highest frequency. Next, four local Mexican suppliers (21%) answered knowledge acquisition through maquila plants. Similarly, one local Mexican supplier (5.26%) answered exposure to the latest technology brought by maquilas. Two local Mexican suppliers (10.52%) answered the quality improvement opportunity.

Most local Mexican suppliers recognize the opportunity with the upgrading of the maquiladora industry. This means primarily that the business opportunities increase with the increase of maquilas and the learning of new knowledge from maquilas increases through those opportunities. On the other hand, one local Mexican supplier (6.25%) commented there is no

opportunity because there is no investment in maquila plants because of the recession (economic crisis).

For the threats, ten local Mexican suppliers (62.5%) answered threats and the other six local Mexican suppliers (37.5%) did not answer or missing data. The response rate is not high. There are no prominent threat answers. Two local Mexican suppliers (14.28%) answered continuous maquila's U.S. product preference. One local Mexican supplier (7.14%) answered various threats such as dependence on foreign methods and technology, a lack of financial and personal security, and larger, better funded foreign competitors, corruption and border crimes etc. Exhibit 32 presents the answers of local Mexican suppliers.

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### Opportunity

(1)The opportunities exist while there is foreign investment. The good news is that there are more jobs in Mexico.

(2) As the investment in maquilas increases, this trend pushes local suppliers (including our plant) to upgrade their technology, or equipment etc. Our plant introduces new management systems or new technology, facility and benchmark or lean management techniques of maquilas.

(3) Quality is very important (Quality improvement of local suppliers).

(4)Exposure to the latest technology bought by maquilas.

(5) No opportunity because there is no investment in maquilas because of the recession.

### Threat

(1)Threat is that they go and buy from the U.S. because the company is American. And they usually tell the owners they are American and they say, (Continued on next page)

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Exhibit 32 Response to the question : There has been a large amount of investment in the maquiladora industry. What are opportunities and threats to local Mexican suppliers?

Purpose : To determine the opportunity and the threat of local Mexican suppliers with the upgrading of maquiladora industry (Local Mexican supplier).

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“they buy things from the U.S. because of taxes. It will be better for this company for the maquilas to pay less taxes so that they buy things from the U.S. and not from U.S..I don’t know what their relationship is with the government and all that, but if your question is, what are the opportunities, I would say work, and the threat is that they go and buy from the U.S..

(2)New methods or technologies (that may be far advanced than local suppliers) brought by the international firms and as a result inhibiting local suppliers to compete in their own local market.

(3)Suppressed innovation and creativity of local suppliers due to over reliance on foreign methods and technologies.

(4)The threat is to provoke the maquiladoras to go away or taking them out because of the lack of personal and financial security.

(5)It is larger, better-funded competitors.

(6) Foreign firms come to Mexico and try to find cheaper and cheaper product or service. This results in or is reinforced by corruption. (The bad news is they come to Mexico looking for cheaper and cheaper ... work and pay less than they pay some other countries. They are supporting that corruption ... they are trying to ... it is a way of doing things, they are looking at Mexico like ... opportunity to set up the way to do it).

(7) Also, the border crimes are bad because this affects investors negatively.

(8)Foreign suppliers are the big threat. For example, many companies moved to China from Mexico (local business 40%). As a result, many people have lost their jobs here. Despite cultural conflicts or problems about transportation costs, for the United States, China still is a threat.

(9)As far as threat, I mean, I guess, in sense, you know with the new technology I see that it’s been used more for useless manpower. We have had some customers who care more about automotive systems. 80% of one of new facilities has an automotive robotics assembly line.

(10)The threats will appear depending on the creation of scenarios not optimal for the investors.

(11) We are overburdened with taxes. There are different ways to accomplish cash flows into reserves of government. They are related to how to promote or generate new work and new jobs. However, we just got hit by taxes. This is a new threat that we are facing on the border.

(12) Though foreign companies enter Mexico because of the low cost, there is a bad effect on investment according to strength or weakness of the peso.

(13) We don’t have integrative suppliers that do the injection molding, the electronic parts and the assembly.

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Exhibit 32 (continued)

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**Local government, local university and RAMMAC responses.** For the question, “There has been a large amount of investment in the maquiladora industry, do you think that the capabilities of local Mexican suppliers have actually increased with the investment,” overall, local government, local university and RAMMAC answered positively. Two local government officers answered yes. Two local university officers and RAMMAC director also said yes.

For the question, “What is the opportunity and the threat to local Mexican suppliers,” for the opportunity, one local university officer answered, investment, especially in training (i.e. competitive human resource training), the other local university officer answered, at least around 80% of potential supplies that maquilas need are supplied from local suppliers. RAMMAC director answered technology. For the threat, the other local university officer commented on the threat of external suppliers on this part of the world through globalization and communication. RAMMAC director answered, more suppliers will play. Suppliers will be crowd; there is more competition as a result. Exhibit 33 and 34 present the answers of local government, local university and RAMMAC.

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### Government

(1) Yes, specifically those providers dedicated to the education and training, the rest of the suppliers will receive the benefit as the cluster matures and attracts specialized vendors for both sectors.

(Continued on next page)

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Exhibit 33 Response to the question : There has been a large amount of investment in the maquiladora industry. Do you think that capabilities of local Mexican suppliers have actually increased with the investment?

Purpose : To determine the capability development of local Mexican suppliers with the upgrading of maquiladora industry (Local government and Local university).

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(2) It depends on local suppliers. More business with maquilas and the capability of suppliers will increase.

University

(1)Local suppliers have used the investment to develop skills and products that are used by the maquiladoras established in the region.

(2)Yes, it is true. There has been a large amount of investment in the maquiladora industry, but I think that the development of local suppliers are behind the development of the maquiladora industry.

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Exhibit 33 (continued)

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Opportunity

University

(1)Investment, especially in training and competitive human resource training.

(2)At least around 80% of potential supplies that maquilas need can be supplied from local suppliers.

RAMMAC

They are going on technology.

Threat

University

The threat is from external suppliers from other parts of the world (through globalization and communication).

(Continued on next page)

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Exhibit 34 Response to the question : There has been a large amount of investment in the maquiladora industry. What are opportunities and threats to local Mexican Suppliers?

Purpose : To determine the opportunity and the threat of local Mexican suppliers with the upgrading of maquiladora industry (Local university and RAMMAC).

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RAMMAC

More suppliers will play, suppliers will be crowd. There is more competition as a result.

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Exhibit 34 (continued)

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In summary, for the upgrading of the maquiladora industry, almost all interviewees answered that the capability of local Mexican suppliers increased. Of course, a few interviewees answered no capability development or no opportunity. Nevertheless, most interviewees gave positive answers. Also, for the opportunity, the following answers were the most frequent; more business opportunities from low cost for foreign firm's investment, as a result more business with maquilas and learning from maquilas about new knowledge and more investment opportunities for local Mexican suppliers. For threats, there are not strong answers and various reasons are given.

### **The Absorptive Capacity of Local Mexican Suppliers**

**Maquila plant responses.** For the question, "To what extent is the absorptive capacity of local Mexican suppliers," (\*The explanation of absorptive capacity [i.e. definition of absorptive capacity] was given to interviewee) four maquilas plants (44.44%) answered no extent or did not answer this question. One maquila (11.11%) answered strong, two maquilas (22.22%) answered good, and two maquilas (22.22%) answered low. Overall, the result is mixed.

For the question, "How can local Mexican suppliers increase the absorptive capacity," five maquila plants (55.55%) answered the solutions, four maquila plants (44.44%) did not answer or are missing data. The response rate is not high. For the solution, three maquila plants (33.33%) answered investment in education. This is the most frequent answer. For the remaining plants,

each one maquila plant (11.11%) answered various solutions. Exhibit 35 is the answers of maquila plants.

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(1) Local Mexican suppliers have to raise the level of capability. Once they get to a certain level, that is, they have a basic structure and basic understanding, they are willing to get to the next step (absorb the capacity). Unless they have a basic structure and basic understanding, then it's hard for them.

(2) If this region will be open, business will increase, and absorptive capacity will increase through learning from maquila plants.

(3) I think they must have better training and technology all the time.

(4) Need to interact more with local customer and understand where the market is going. This means to be more involved with local customer (i.e. this plant) closely. Our plant will share information about the market trend with local suppliers. So, local suppliers are the extension of local customers (this plant) and local suppliers can use that knowledge to get more business and grow.

(5) Economic level doesn't match political or cultural level. Politics needs to be stabilized, democratized and open.

(6) Local suppliers need to invest in people (education) and equipment. They need to have the financing to do that (especially go out and get the equipment, the capital equipment or make the capital expenditure). In Mexico, local suppliers still use manual labor to do automated work and it's strictly because of the financing of the company.

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Exhibit 35 Response to the question : How can local Mexican suppliers increase the absorptive capacity?

Purpose : To determine the solution to increase the absorptive capacity of local Mexican suppliers (Maquila plant).

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**Local Mexican supplier responses.** For the question, “ To what extent is the absorptive capacity of your company, ” two local Mexican suppliers (12.5%) answered very strong and eight local Mexican suppliers (50%) answered strong. Three local Mexican suppliers (18.75%) answered no extent, but the positive extent of absorptive capacity. Overall, most local Mexican



suppliers answered positive absorptive capacity (strong, very strong, or good absorptive capacity).

For the question, “How can your company increase the absorptive capacity,” nine local Mexican suppliers (56%) answered the solution. Seven local Mexican suppliers (43%) did not answer or are missing data. The response rate is not high. Three local Mexican suppliers (27.27%) answered training and education. Two local Mexican suppliers (18.18%) answered: do more business with maquilas. The remaining each one maquila answered various solutions. Overall, the solutions for increasing absorptive capacity are similar to the answers of maquila plants. Exhibit 36 is the answers of local Mexican suppliers.

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(1) *I understand, attending the conferences, learning from customer plants (Interviewer): Yes. seminars, conferences etc. The general university is not the primary source (Interviewer): General university? Specific school, training school, seminar, conference ... (Interviewer): Yes.*

(2) The training of employees and motivation for learning are necessary to increase the absorptive capacity.

(3) When we can watch maquila plants more frequently by having more positions and jobs, we can increase the absorptive capacity. In other words, if we do more business with maquila plants, absorptive capacity will increase.

(4) Hiring people is necessary to increase the absorptive capacity, especially people to keep over knowledge (*In other words, especially people who are in charge of knowledge of the business*).

(5) *Your company is strongly motivated to try to learn from maquila plants (Interviewer): Yes.*

(6) (I mean), searching for internet and new technology.

(7) Relationship with equipment vendor. (Continued on next page)

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Exhibit 36 Response to the question : How can your company increase the absorptive capacity?  
Purpose: To determine the solution to increase the absorptive capacity of local Mexican suppliers (Local Mexican supplier).

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(8) Doing best practices.

(9) Through the special departments, from the different operating areas.

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Exhibit 36 (continued)

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**Local government, local university and RAMMAC responses.** For the question, “To what extent is the absorptive capacity of local Mexican suppliers,” one local university officer answered not strong but is in the developing stage. RAMMAC director answered the absorptive capacity of local Mexican suppliers is strong.

For the question, “How can local Mexican suppliers increase the absorptive capacity,” one local government officer answered human capital (e.g. the involvement with the electric electronics cluster program). One local university officer said financial support and people. The other local university officer said education. For education, the first topic is potential opportunity to local Mexican suppliers and the second topic is trained people in the university for maquiladoras and local Mexican suppliers. Overall, trained people are commonly recognized as important. RAMMAC director answered that communication with the government is important. Communication with high level people and financial support, especially from programs or communication between maquilas and governments. This supports (technical) requirement of maquila plants. Exhibit 37 is the answers of local government, local university and RAMMAC.

In summary, for the extent of absorptive capacity of local Mexican suppliers, most local Mexican suppliers answered positively (strong or very strong) but maquila plants, local governments, local universities and RAMMAC show a mixed evaluation overall. For the solution to increase the absorptive capacity of local Mexican suppliers, education (of people),

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## Government

First, for economic crisis, human capital management or, manpower on human capital is important. Rather than fire or lay-off, the salary reduction or overtime reduction is better. Because after layoff, newly hired people cost too much to train and educate. Second, through the Tamaulipas electronics cluster program, suppliers can interact and communicate with maquilas. Then, suppliers can get technology. In the cluster program, maquiladoras show to the local university what maquiladoras will need specifically from new professionals. Now, there are the programs to satisfy these maquilas needs. It's OK. That is the main point in the cluster. That can increase the absorptive capacity because new professionals will work in suppliers and maquiladoras.

## University

(1)Local suppliers need more financial support because many people in this area need the support (for the electronics industry).

(2)Education. Local suppliers don't know the potential opportunities. Also educating people for maquilas and local suppliers in the universities. Our university is in the industrial park and provides people for maquilas.

## RAMMAC

As well as financial side, high-level people are important. In this aspect, communication from the government is important. This is about not only finance but also that, educationally, people support the requirement of maquilas, (especially about how to technically support them).

Local suppliers have a good opportunity. There is program or communication between maquilas and governments. This is helpful to local suppliers about finance and people.

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Exhibit 37 Response to the question : How can local Mexican suppliers increase their absorptive capacity?

Purpose: To determine the solution to increase the absorptive capacity of local Mexican suppliers (Local government, Local university and RAMMAC)

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financial support, and more business with/learning from maquilas are the primary answers.

## **Border Environment**

**Maquila plant responses.** For the question, "Are there any other important factors (e.g. border environment) for the capability development of local Mexican suppliers," eight maquila

plants (88%) answered any other important factors. For those maquilas that answered, three maquila plants (33.33%) answered border security. Each one remaining maquila plant (11.11%) answered various factors. Exhibit 38 presents the answers of maquila plants.

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(1) I don't think so. The border environment? Probably that would be one. You know the situation of the city, like the crimes and all those kind of things. So that might scare them a little to grow, or to have more business because they may be scared to be kidnapped or whatever because there's a lot of crime in Tamaulipas.

So that may be a concern, or something to think about before doing more business.

(2) I don't have any. There is only opportunity for suppliers. The border environment is sometimes also a limitation to local Mexican suppliers, especially the financial side.

(3) Infrastructure will help to develop suppliers. The communication between cities needs to be easier (faster interaction, for example, between Laredo and Reynosa) so I hope there will be more crossing points between Texas and Mexico like a Mission international bridge.

(4) Easier transportation or logistics is important.

(5) There is no other factor, but local Mexican suppliers and maquilas have the border, and the U.S. Here, the newest local Mexican suppliers have the opportunity to get every thing, including technology, from the U.S.

(6) People pay 15% in Mexico, but on the border, people pay 10%. This is an important factor to help the maquila survive and the suppliers grow. If local small firms do business farther in Mexico, they pay a 15% tax, but local small firms that do business on the border (with maquilas) pay a 10% tax (Interviewee agreed with this point).

(7) In the future, economic treaties among Latin American countries (Bolivia etc and Mexico) will be scheduled. ... Because of these economic trade treaties, this region is expected to grow and there is the benefit.

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Exhibit 38 Response to the question : Are there any other important factors (e.g. border environment) for capability development of local Mexican suppliers?

Purpose : To determine any other important factors (e.g. border environment) for the capability development of local Mexican suppliers (Maquila plant).

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**Local Mexican supplier responses.** For the question, “Are there any other important factors (e.g. border environment) for the capability development of local Mexican suppliers,” local Mexican suppliers cited various factors. Two local Mexican suppliers (18.18%) answered access to good financial sources and good insurance. The remaining local Mexican supplier (9.09%) cited various factors. Exhibit 39 presents the answers of local Mexican suppliers.

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(1) One important factor is access to good financial source and good insurance.

(2) *Specially border environment (Interviewer):* Of course, the economy of the country is a very important factor. *The economy of country means US economy or Mexican economy (Interviewer):* Both. ... the border ... especially here Monterrey, the economy during the U.S. recession within the past five years ... really effected because all the industry on the border; the main customers are in the U.S. and that affected a lot.

(3) Yes. The transaction between suppliers and maquiladora plants has take a long time.

(4) There is a partnership among suppliers for forming a supplier base (or integrative or multifunctioning suppliers). That is, suppliers don't only compete (for the sales). Suppliers can help each other and the supplier database, which suppliers need to help each other, is created. As a result, more companies can come to Monterrey. Overall, suppliers don't just compete but through collaboration a supplier base is created, and more companies enter Monterrey and do business.

(5) Truthfully, the thing is corruption. Bribes are given privately.

(6) Government investment in education and technology.

(7) I guess the contribution of the government makes things easier. For the establishment of a firm, government needs to simplify the process. I guess, this is one important factor.

(8) I would say the cost of technology, the cost of assets, the equipment or new technology should be available. The reasonable cost time is a big factor.

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Exhibit 39 Response to the question : Are there any other important factors (e.g. border environment) for capability development of local Mexican suppliers?

Purpose : To determine any other important factors (e.g. border environment) for the capability development of local Mexican suppliers (Local Mexican supplier).

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(9) The supplier should have in mind the constant betterment of company to be able to cover the necessities of their clients.

(10) The local environment that local suppliers do business with does have an effect on how much investment we can attract. Local suppliers need to send the message to the outside world that Matamoros and Northern Mexico is one of the most viable place to do business in the world.

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Exhibit 39 (continued)

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**Local government, local university and RAMMAC responses.** For the question, “Are there any other important factors (e.g. border environment) for the capability development of local Mexican suppliers,” local government, local university and RAMMAC director cited various factors.

One government officer said economic crisis. That is, the supply chain continues despite of border crime, and industrial activity on the border is so dynamic and intense. Local Mexican suppliers are being impacted mostly because of the economic crisis. The other government officer comments that border security or crime on the border is not an issue or problem.

Transportation is also not a problem because a new international bridge will be added.

Overall, the government officer recognizes that border crimes or border security is not an obstacle to economic development. One university officer answered that it is to change the culture of students so they become entrepreneurs. RAMMAC director answered no, but she comments an important border environment may be logistics because if there are Mexican suppliers in Mexico they will cross. Exhibit 40 presents the answers of local government, local university and RAMMAC.

In summary, interviewees answered various factors that may affect the capability development of local Mexican suppliers. For maquila plant interviewees, border security is relatively more frequent but for local Mexican suppliers, local government, local university and

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## Government

(1)The supply chain continues despite crime, and industrial activity on the border is so dynamic and intense. Local suppliers are being impacted mostly because of the economical crisis.

(2)No border security problem. No transportation problem because more international bridges will be scheduled to be completed.

## University

Change the culture of students so they become entrepreneurs.

## RAMMAC

No. Maybe logistics because if there are Mexican suppliers in Mexico, they cross.

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Exhibit 40 Response to the question : Are there any important factors (e.g. border environment) for capability development of local Mexican suppliers?

Purpose : To determine any other important factors (e.g. border environment) for the capability development of local Mexican suppliers (Local government, Local university and RAMMAC).

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RAMMAC, border security is not the most frequent factor. Overall, various factors such as logistics and the economic crisis are suggested. Building more favorable business environments such as access to finance and insurance, technology, asset and equipment etc is answered as one factor.

## **Recession**

**Maquila plant responses.** For the question, “Recession is the current economic situation. Does this economic situation affect the answers to the above questions? If yes, what are the effects,” interviewees answered the effect of the recession on their plants and the suppliers. Eight maquila plants (88.88%) answered yes (i.e. there are effects of recession). One maquila (11.11%)

did not answer. The effect of the recession is suggested variously. Exhibit 41 presents the answers of maquila plants.

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(1) However, in the recession, maquila plants reduce the amount of people working for them. Also, local suppliers are smaller, too.

(2) The economy has an impact on the relationship with suppliers about the sales or the price of maquilas (Inventory management is related).

(3) The economic situation affects this plant's orders. This plant's orders impact the business or quantity of local suppliers.

(4) Also, a procurement cost or spending goes down.

(5) I mean, we are asking them for lower prices.

(6) Some of the suppliers went away.

(7) In theory, during recession, there should be an improved chance of dealing with Mexican suppliers. That is, many U.S. companies went bankrupt. So, the (strong) Mexican suppliers may have an opportunity. However, unfortunately this didn't happen. This plant had many U.S. companies. Many of those companies went bankrupt. This plant needed new companies. But, this plant didn't find those new Mexican suppliers (transactors or partners).

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Exhibit 41 Response to the question : Recession is the current economic situation. Does this economic situation affect the answers to the above questions? If yes, what are the effects?

Purpose : To determine the effect of recession (Maquila plant).

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However, for the question, "Is there any difference for suppliers relations (e.g. transaction type etc) in a good economic situation or a bad economic situation," Seven maquila plants (77.77%) answered no difference and the two remaining maquila plants (22.22%) were not asked or did not answer.

**Local Mexican supplier responses.** For the question, "Recession is the current economic situation. Does this economic situation affect the answers to the above questions? If yes, what



are the effects,” interviewees answered the effect of the recession on them and maquila plants.

Fifteen local Mexican suppliers (93%) answered that there are effects of the recession. One local Mexican supplier (6.25%) was not asked or did not answer. Exhibit 42 presents the answers of local Mexican suppliers.

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(1) Order or transaction quantity (overall volume) is different (In the recession, order or transaction quantity or volume is lower).

(2) Clients or customers require cheaper materials.

(3) Raw materials purchasing is decreasing during recession because of low sales.

(4) Yes. effect. For example, affection on production . Yes, for example, production is affected.

(5) Limited resources to provide additional training, workers, etc.

(6) Local suppliers need to converse with maquiladoras and governments about how to develop or how to suggest things to happen; the economy definitely affects the way that local suppliers are responding.

(7) Recession makes our business slow down.

(8) Yes, it impacts. In the bad economic situation, maquila plants have less produce (or product).

(9) Customer sales are down.

(10) The customer reduces the budget for suppliers – investment or business with suppliers decreases.

(11) There is (small) pressure from the customer because of the customer’s sales decrease.

(12) Government tax decrease.

-Etc (Supplier’s no transaction volume change).

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Exhibit 42 Response to the question : Recession is the current economic situation. Does this economic situation affect the answers to the above questions? If yes, what are the effects?

Purpose : To determine the effect of recession (Local Mexican supplier).

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However, for the question, “ Is there a difference in supplier relations (e.g. transaction type etc) in a good and bad economic situation,” eleven local Mexican suppliers (68.75%) answered no difference, five local Mexican suppliers (31.25%) were not asked or did not answer.

**Local government, local university and RAMMAC responses.** For the question, “Recession is the current economic situation. Does this economic situation affect the answers to the above questions? If yes, what are the effects,” one government officer said yes. The government officer said the auto industry suppliers have serious problems. One university officer said yes. One university officer comments that the global crisis has affected the economy in Reynosa and is reflected in the reduction of jobs. RAMMAC director answers no. RAMMAC director answers that the maquila industry supports local Mexican suppliers and it (recession) is about economy.

For the question, “Is there any difference of supplier relations in the good and bad economic situation.” the other government officer said no difference. For the question, “What is the effect of the recession for your university,” one university officer said that the placement of graduates has been impacted significantly and recruitment has reduced. The university officer also commented that the university’s training courses and services for companies has been reduced because they are giving priority to other activities. The student’s salary also decreases. The other university officer said the university (as a private university) during recession times captures the number of students who cannot go to larger cities due to economic difficulties. Exhibit 43 presents the answers of local government, local university and RAMMAC.

In summary, maquila plants, local Mexican suppliers, local governments and local universities all answer that recession affects their businesses. In particular, maquila plant and

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## Government

(1) Yes, for now one of the most impacted sectors is the automotive sector; many suppliers dedicated to this important sector are having serious problems.

(2) There is no difference of supplier relations (e.g. transaction type etc) in a good and bad economic situation.

## University

Yes. As a global crisis, Reynosa participates directly in the economy and has been affected by the crisis; this is mainly reflected

*What is the effect of the recession for your university?(Interviewer)*

(1) The placement of graduates is significantly impacted and recruitment is reduced. University training courses and services for companies has been reduced because they are giving priority to other activities. Student's salary decreases.

(2) Our university as a private university during recession times captures the number of students who can't go to larger cities due to economic difficulties.

## RAMMAC

No, The maquila industry supports local Mexican suppliers. It (recession) is about the economy.

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Exhibit 43 Response - Recession is the current economic situation. Does this economic situation affect the answers to the above questions? If yes, what are the effects?

Purpose - To determine the effect of recession (Local government, Local university and RAMMAC).

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local Mexican supplier transaction volume and transaction price decrease. Also, production and sales decrease and there is a bankruptcy of local Mexican suppliers. Local universities are impacted by the recruitment of graduates and new student entrances. On the other hand, for the question - is there any difference for the supplier relations in the good and the bad economic situation, almost all interviewees answered there is no difference. That is, supplier relations, such

as transaction type, seem steady during good and bad economic situations. The difference seems to be mainly quantitative volume or price between maquila plants and local Mexican suppliers.

Additionally, sourcing strategies in the recession and the survival strategy of local Mexican suppliers in the recession were asked.

### **Sourcing Strategy of Maquila Plant in the Recession**

**Maquila plant responses.** For the question, “Is there any special sourcing strategy of your plant in the recession,” six maquila plants (66.66%) answered that there is a special sourcing strategy of the plant in the recession. One maquila plant (11.11%) answered no. Two maquila plants (22.22%) did not answer or are missing data.

For the sourcing strategy in the recession, maquila plants answered various sourcing strategies. Specifically, two maquila plants (33.33%) answered increasing local sourcing in Mexico compared to the U.S. side. This appears with the most frequency. Each other (16.66%) maquila plant answered various sourcing strategies in the recession. Exhibit 44 presents the various answers of maquila plants.

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(1) Yes, we truly want to have more sourcing in Mexico. Corporate has to find low cost countries in Asia or Mexico, wherever the cost is low. So, they're looking. The plant also wants low cost suppliers so we want local low cost suppliers. So, when we have discussions with purchasing we make sure that there's always local representation. We make sure that when they quote work, they don't quote Michigan, Germany, Canada and not Mexico. They have to quote Mexico; they have to quote Asia, Thailand, wherever. So we really support the local supplier base. *I understand that during the recession period, all materials are low cost and sourcing is important. So our plant tries to find low cost materials in places like, Asia or Mexico. So anyway, as far as the Mexican side of sourcing is concerned, will the quantity increase in the recession period compared to the U.S. suppliers or will U.S. materials coming from the U.S. decrease?*

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Exhibit 44 Response to the question : Is there any special sourcing strategy of your plant in the recession?

Purpose : To determine the sourcing strategy of maquila plants in the recession  
(Maquila plant)

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*It may decrease during the recession period?(Interviewer):* Yes, correct.

(2) Our plant checks the financial status of local transaction suppliers very closely. The overall meaning is, if committed suppliers go bankrupt, it will be problem to this plant.

(3) The sourcing process in the automotive industry is very tough because of long lead times (12-18 weeks). So, the close contact and monitoring of a customer's requirement to give feedback to suppliers is very important for keeping the proper level material and inventory. There are special teams in this plant for this purpose.

(4) Headquarters in the U.S. decides the sourcing strategy. All negotiations are from the corporate office. I cannot explain.

(5) During the economic downturn, this plant pulls resources from the Chihuahua facility or the Guadalajara facility to fill our supply chain. This may cost this plant a little bit more in the short term until we develop another supplier or find another supplier locally but this plant will survive it.

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Exhibit 44 (continued)

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### **Survival Strategy of Local Mexican Suppliers in the Recession**

**Maquila plant responses.** For the question, "Many local Mexican suppliers may go bankrupt in the recession. How can local Mexican suppliers survive in the recession," seven maquila plants (77.77%) answered the survival strategies. Two maquila plants (22.22%) did not answer or skipped the question (no information). For the survival strategies, two maquila plants (28.57%) answered cutting staff, reducing expenses and doing the business with less resources. Each other maquila plants (14.28%) cited various strategies. Exhibit 45 presents the answers of maquila plants.

**Local Mexican supplier responses.** For the question, "What is the survival strategy of your company in the recession?", twelve local Mexican suppliers (75%) answered the survival strategy. Two local Mexican suppliers (12.5%) answered that they do not have any special

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(1) Unfortunately, the best way is to keep cost down and to maintain the relationship with sales-revenue people as tight as possible to keep the competitive cost of a supplier. For cost cutting, unfortunately by that volume, local suppliers have to reduce people. They have to cut cost. This plant tries to reduce 6 costs to a minimum level, like the type of energy, type of water, maintenance all that stuff, as well as fix cost to a minimum.

(2) I don't know specific recommendations for pure local Mexican suppliers. However, general recommendation for business can be applied to them. They need to know the automotive industry, but the recommendation is to diversify the (customer) industries.

(3) Absolutely; it is to keep the financial point.

(4) Local suppliers need to develop new strategies for sale to lower the price and to have more volume.

(5) Local suppliers need to utilize customers or maquila plants more because of the increased overhead cost that comes with lower capacity and lower sales. They need to recognize that customers or maquila plants don't take advantage of them.

They need to make sure that customers or maquila plants support them through pricing, through initiatives, Six Sigma and Lean. This is the only way they can survive if they continue to do business the same way.

(6) Price competitiveness or quality competitiveness is important in the recession. Before, just order or quantity dependent practice is difficult. No more.

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Exhibit 45 Response to the question : How can local Mexican suppliers survive in the recession?  
Purpose : To determine the survival strategy of local Mexican suppliers in the recession (Maquila plant).

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survival strategy. Two local Mexican suppliers (12.5%) answered they could not answer because of the company security issue. For the survival strategy, local Mexican suppliers answered various reasons. Overall, diversification strategy is the most frequent answer. That is, four local Mexican suppliers (18.18%) answered the diversification of various types of customers and two local Mexican suppliers (9.09%) answered diversification of various regions. Additionally, two local Mexican suppliers (9.09%) answered cost reduction (be more efficient). For the remaining

(4.54%), local Mexican suppliers answered various strategies. Exhibit 46 presents various answers of local Mexican suppliers.

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(1) We were about four clients' primary clients, now we will be very strong in the home appliance industry. So now we are going into the automotive industry so we can expand to the United States. So its a good thing we were not in the automotive business but now we want to be more, how to say, diversified.

(2)A problem in recession is this: we lost this client, all 80% of our production was for this client, so when they decided to close the Monterrey plant and move to China, we had problems because all 80% of our production was for them. We want a lot of clients because we have three principal plants at this moment : we have developed several plants ...sixteen plants...We don't have a safe program at this moment; we implement that program we find to the ... Reynosa to the information to the maquilas. *So, one policy is to conduct business with customers in more areas (Interviewer):* Laredo has new programs, and there is a new state program in Reynosa, Tamaulipas, and Torreon...areas we are very interested in. *One more policy is to start or increase sales in new regions (interviewer):* Yes.

(3)It is cost reduction and to be more efficient.

(4)Scaling back.

(5) Reducing overhead.

(6) This plant depends on the survival strategy of headquarters.

(7) The first goal is to keep quality in the service.

(8)We should be able to adjust to our clients needs.

(9) It means government policy for economic or regional development and has affected the business of customers for local suppliers. That is, new or potential business opportunities for local suppliers. For example, a petroleum company is very strong. This company got more work as a strategy for government where investing in that area is very strong - following the government policy or strategy. This is an option or business opportunity for this supplier. (Continued on next page)

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Exhibit 46 Response to the question : What is the survival strategy of your company in the recession?

Purpose : To determine the survival strategy of local Mexican suppliers in the recession (Local Mexican supplier).

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(10) Actually there is no special survival strategy. This supplier doesn't fire employees. This supplier tries to keep the markets. Be cheaper for clients.

(11) This supplier tries to keep the markets.

(12) We have strong advertising and publicity in telephone books and others.

(13) We are also thinking of making products and integrating the tool shop.

(14) In the recession big companies may have a difficult time because of the size. Because the sales and the production decrease, they may have a large reduction in the use of machine and people etc. However, small companies may be easier to survive because of the small size; they are more flexible, easier to change, more economical, and are a low volume/niche market. There is an advantage. This plant does something in this aspect.

(15) Lean and capable organization.

(16) Ability to react to market conditions and diversification.

(17) We do continuous financial tutoring by former CEO or local banker.

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Exhibit 46 (continued)

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Overall, local Mexican suppliers and maquila plants cited various survival strategies of local Mexican suppliers. Local Mexican suppliers and maquila plants showed diversification and cost reduction as two important strategies. For local Mexican suppliers, diversification is the highest frequency survival strategy in the recession (i.e. diversification - region or customer) - six local Mexican suppliers (27%) answered. Two local Mexican suppliers (9.09%) answered cost reduction. Also, two maquila plants (28.57%) answered cost reduction. The other local Mexican suppliers and maquila plants cited various survival strategies.

**Local university and RAMMAC responses.** For the question, "Many local Mexican suppliers may go bankrupt in the recession. How can local Mexican suppliers survive in the recession," one local university officer commented that maquila plants and local Mexican



suppliers are expected to overcome the crisis together with better products and better prices. The other local university officer said if three different entities (government, maquiladoras and universities) can do the work to support this effort - local Mexican suppliers will survive. RAMMAC director answered it is really up to suppliers. The global economic crisis gives more opportunity to local Mexican suppliers. That is, maquilas find or support local Mexican suppliers locally. Local Mexican suppliers are close with maquilas. In addition supplier development programs will be helpful . Exhibit 47 presents the answers of the local university and RAMMAC.

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#### University

(1)Maquila plants and local Mexican suppliers are expected to overcome the crisis together with better products and better prices.

(2)I think that if the three different entities (government, maquiladoras, and universities) do their work supporting this effort, the impact would not be as bad, and suppliers can survive this difficult period.

#### RAMMAC

This question is really up to suppliers. Local suppliers may go with maquilas in the economic situation. If the maquila industry is good, local suppliers may be good, and vice versa. It's the global opportunity. Maquilas look for support globally. Overall, there are more opportunities for local Mexican suppliers. Maquilas find or support local Mexican suppliers locally. Local Mexican suppliers are close to maquilas.

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Exhibit 47 Response to the question : How can local Mexican suppliers survive in the recession?  
Purpose : To determine the survival strategy of local Mexican suppliers in the recession (Local university and RAMMAC)

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### **Difficulties in the Transaction between Maquila Plants and Local Mexican Suppliers**

**Maquila plant responses.** For the question, “What are the difficulties in transacting with local Mexican suppliers,” two maquila plants (22.22%) answered no difficulty. Six maquila plants (66.66%) answered difficulties. One maquila answer (11.11%) is missing data.

For the difficulties that maquila plants answered, each one maquila plant (16.66%) answered various difficulties. Exhibit 48 presents the answers of maquila plants.

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(1) Communication problems are related to the Mexican culture, including language; an example is appointment delay etc.

(2) The difficulty is to respond to our plant's need for customers. Some Mexican suppliers' low level of supporting technology and reacting quickly to our plant program. Solution : our plant helps or assists (e.g. sending experts to suppliers).

(3) I cannot tell exactly. However, it depends on the capability of suppliers such as finance or location.

(4) The difficulties are customs, duties and paper work when dealing with Mexico to Mexico.

(5) The difficulties are the commitment to deliver and the inability to deliver on time.

(6) No business transaction without cash or check. In Korea, if there is a (long) transaction, a transaction without cash or check is possible.

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Exhibit 48 Response to the question : What are the difficulties in the transaction with local Mexican suppliers?

Purpose : To determine the difficulties in the transaction with local Mexican suppliers (Maquila plant).

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**Local Mexican supplier responses.** For the question, "What are the difficulties in transacting with maquila plants," nine local Mexican suppliers (56.25%) answered the difficulties. Three local Mexican suppliers (18.75%) answered no difficulties. Four local Mexican suppliers (24.95%) did not answer or their answers are missing data. For the difficulties, local Mexican suppliers answered various difficulties. The most frequent answer is the relationship with people in the maquila (63.63%). That is, local Mexican suppliers indicate the relationship with people in the maquila is the most difficult issue. Exhibit 50 shows various difficulties related to people in the maquila plants. Next, each individual local Mexican supplier (9.09%) answers various reasons

such as delivery, payment on time, corruption and reception of invoice. Exhibit 49 presents the answers of local Mexican suppliers.

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(1) Usually the most difficult part for the people of the company who are in charge of buying, which is the most difficult part because sometimes they do get, you know, money (i.e. bribe) from other companies.

(2) I guess, one of the difficulties is delivery, you know. *Delivery of products means that your company delivers products to customer plant directly?* (Interviewer): We cannot do that. We cannot deliver into Mexico. We have to deliver to custom brokers here on the border. Custom brokers have to cross and take it into Mexico.

(3) The problem is timely payment.

(4) People in the company who are in charge of buying the parts. Sometimes corruption is an issue. Receiving money from the company for the purchasing of...

(5) Most of the problems are because of the reception of the invoices. It is one of the most difficult steps in the process, which is giving up the funds or the down payments or the actual project ...

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Exhibit 49 Response to the question : What are the difficulties in transacting with the maquila plant?

Purpose : To determine the difficulties in transacting with maquila plants (Local Mexican supplier).

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(1) The difficulty is dealing with some people in the maquila plants.

(2) Usually, the most difficult part for the company is dealing with people who are in charge of buying because sometimes they get bribed by other companies.

(3) The difficulty is to find the right person who buys something. Interviewee doesn't know why. So, organizationally it is mess.

(4) Sometimes I receive payments late. I don't have a problem with this but when they have new employees I don't have the information or time we need to search the people who give me the information about the employees; it's the only problem. (Continued on next page)

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Exhibit 50 The difficulties of the relationship with people in the maquila plants (Local Mexican supplier)

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(5) When we begin the transaction with maquilas, we have the difficulties if we don't have acquaintances inside the maquila.

(6) Ah, sometimes the owners of the maquilas are U.S. citizens and usually the U.S. citizen wants everything to get repaired in the U.S. or buy things from the U.S., ... *trust the U.S.*  
(Interviewer): yes.

(7) The other thing is the safety permit. For hard work, and work in high prices, we find the right person and get the permits in the organization. This process is a difficult process in the project.

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Exhibit 50 (continued)

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In summary, 66% of maquila plants answered various difficulties in transacting with local Mexican suppliers such as communication problems and a low level supporting or supporting technology to quickly react to the plant's need. 22% of maquila plants answered no difficulties. 18.75% of local Mexican suppliers answered no difficulties. 63.63% of local Mexican suppliers answered that the difficulties, interestingly, for local Mexican suppliers are the relationships with people in maquila plant. For example, they are primarily people in the maquila plant who are in charge of buying the parts. It includes the corruption issue. The other reasons local Mexican suppliers seem to be similar to those of maquila plants.

### **Corruption**

**Maquila plant responses.** For the question, "Many people comment on the corruption in the transaction between maquiladora plants and local Mexican suppliers, especially in the relationship among maquiladora plants, local Mexican suppliers and distributors, (a) What is the problem? (b) How to solve the problem," maquila plants answered these questions.

For the corruption experience, two maquila plants (22%) answered corruption experience, seven maquila plants (77%) answered no corruption experience. Here, corruption experience means that the corruption experience affects the business directly.

For the corruption problem question, two maquila plants (22%) all answered that local Mexican suppliers offer money (or gifts) for purchasing buyers or purchasing managers. For the solution of corruption, three maquila plants (33%) answered the solution. The other 67% is missing data or answered I don't know. Exhibit 51 presents the answers of maquila plants.

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#### Solution of corruption

(1) I believe that adequate cooperative controls can enforce the ethics and responsibility while conducting businesses between companies.

(2) In the past, it is very common to give money to the buyer or purchasing manager or whatever. What I have seen is that employees take money from suppliers, it has to go. They must be punished. But the preventive is training, we work with the ethics code.

(3) This plant developed a conflict of interest between both buyer and supplier. Both buyer and supplier were reported for their corrupted actions. This plant did identify several suppliers and stopped doing business with them.

(4) Now I don't recognize or is not aware of the effort for communication against corruption for local suppliers, maquila and distributors. However, surely, there's some communication of wants going on. RAMMAC and the local government may be involved.

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Exhibit 51 Response to the question : What is the solution of corruption?

Purpose : To determine the solution of corruption (Maquila plant).

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**Local Mexican supplier responses.** For the question, "Many people comment on the corruption in the transaction between maquiladora plants and local Mexican suppliers, especially in the relationship among maquiladora plants, local Mexican suppliers and distributors, (a) What is the problem? (b) How to solve the problem?, local Mexican suppliers answered these questions.

For the corruption experience, eleven local Mexican suppliers (68%) answered no experience, three local Mexican suppliers (18%) answered experience. Two local Mexican suppliers (12.5%) did not answer or their answers were missing data.

For the corruption problem question, both local Mexican suppliers (25%) answered money under the table, and lack of control in human resources. This is a relatively high percentage. The remaining local Mexican suppliers (12.5%) answered various answers. Exhibit 52 presents the answers of local Mexican suppliers.

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### Problem of corruption

(1) Mexican based competitors do corrupt actions like take money under the table. However, this supplier and maquilas have no (business) climate for corruption - long transaction period etc.

(2) The Mexican buddy-buddy system is a problem.

(3) The essential problem is the “Mexico is cheap” mindset when entering or beginning the business in Mexico. So, people go the wrong way and it may be easier to be corrupted. This is an actual problem.

(4) Usually, the most difficult part for the company is dealing with people who are in charge of buying because sometimes they get bribed by other companies. For example, a supplier may charge a maquila 10 pesos for a product. The maquila thinks that the price is expensive and doesn't buy. The other guy, like the thirty party buys the product for 10 pesos. He goes to maquilas and resells the product for 20 pesos. The person who is charge of buying from suppliers may receive 5 pesos (i.e. bribe) for 20 pesos from the guy. This problem faced by maquilas is endemic and systemic.

(5) There is no special regulation or rule about contracts (or transactions ) between local suppliers and maquilas.

(6) Lack of greater control in human resources to classify personal information gives them the proper continuity. I am making reference to the corruption in the supply for the maquiladoras and to keep an eye on them, because if the companies go bankrupt, they do not take in consideration the quality of the product, but the corruption.

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Exhibit 52 Response to the question : What is the problem of corruption?

Purpose : To determine the problem of corruption (Local Mexican supplier).

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For the solution of corruption, seven local Mexican suppliers (43%) answered the solutions. Corporate level policy or control over personnel is a relatively high percentage. Two local Mexican suppliers (20%) answered people and investors in education, and control over the personnel (selection and proper continuity) etc. Exhibit 53 presents the answers of local Mexican suppliers.

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### Solution of corruption

#### (1)Corporate level policy

-The problems can be solved not by the local level but by the corporate level.

Maquilas are far from Headquarter. So, headquarter is not aware of what's going on. In Mexico, there are different types of ethics. The buddy system is stronger in Mexico. For example, they support their Mexican suppliers before considering someone else.

-Control over personnel (e.g. selecting, classifying personal information and giving the proper continuity)

-When we do hire, we select the best person

-They should not have a criminal background, not him, not his family, or the second generation. This will identify the bad elements and avoid godfather and friendship preferences.

-A continuous change of people (throughout the maquila) related to corruption is necessary.

-The other opinion is to explain to investors the damage or disadvantage of corruption related to money or the budget.

#### (2)Communication among maquiladoras,suppliers (and distributors).

(3)Government change (First, government corruption needs to be abolished).  
(Continued on next page)

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Exhibit 53 Response to the question : What is the solution of corruption?

Purpose : To determine the solution of corruption (Local Mexican supplier)

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Generally 60% of Mexican firms are corrupted. I am not sure of the solution. It is a difficult story because government needs to be corrected. First, the corruption related to government needs to be abolished, and the next level is the corporate level.

(4) All Mexicans or the Mexican business style needs to be changed. The corruption needs to be stopped. The market system is necessary for it to work. The Mexican business style focuses on cheap prices and this is related to corruption. For example, when people have heart problems or car tire problems, instead of paying the normal market price, the cheap price is favored. Also, government reform is necessary to resolve corruption.

(5) Government role (e.g. Chamber of industry and transformation).

The secretary of economy needs to support the chamber of industry and transformation which does not even work properly.

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Exhibit 53 (continued)

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**RAMMAC responses.** For the question, “Many people comment on the corruption in the transaction between maquiladora plants and local Mexican suppliers, especially in the relationship among maquiladora plants, local Mexican suppliers and distributors (a) what is the problem? (b) how to be solved”, RAMMAC director answered these questions.

For the corruption problem question, RAMMAC director answers that she does not have any information. In addition, she commented that it is better to hear or get the information from local Mexican suppliers.

For the solution of corruption, RAMMAC director comments that maquilas have an internal process or program regarding political or ethical issues. Maquilas have ethical training programs for employees and suppliers. The RAMMAC director also commented that she does not have the information of the internal information of maquilas

In summary, two maquila plants (22%) indicated that they experienced corruption and corruption affects the business directly. The primary problem is bribes. The solutions are as



follows: corporate control, ethical training of people and communication among maquilas and local Mexican suppliers (and distributor).

For local Mexican suppliers, three (18%) indicated they experienced corruption. For example, money under the table (bribe), Mexican specific buddy-buddy system and cheating about the price in the transactions among suppliers and maquilas, are some of the various forms of corruption local Mexican suppliers faced. For the solutions, more various solutions are suggested. Corporate level control is the most frequent solution such as control over personnel (e.g. selecting, classifying personal information and giving proper continuity) and educating people and investors. This corporate level solution was also suggested in the maquila plant.

### **RAMMAC Supplier Development Program (Supplier Database) <sup>1</sup>/ Cluster Program**

The RAMMAC supplier development program (supplier database) and cluster program are the important supplier development programs in Reynosa. Therefore, the status of these programs was investigated.

**Maquila plant responses.** For the question, “Do you know RAMMAC,” eight maquila plants (88%) answered yes. One maquila plant (11%) answered no. For the question, “Do you know RAMMAC supplier development program or RAMMAC supplier database,” four maquila plants (44%) answered yes, and five maquila plants (55%) answered no. For the question, “Is your plant satisfied with the current RAMMAC supplier development program,” four maquila plants (44%) answered yes, and five maquila plants (55%) did not answer (no information). The response rate is not high. For the question, “How can RAMMAC supplier development programs develop,” six maquila plants (66%) did not answer or skipped the question. The response rate is low. One maquila answer (11%) is missing data. Only two maquila plants (22%) answered the

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<sup>1</sup>Because RAMMAC participates in the cluster program, the RAMMAC supplier development program means broadly cluster program and narrowly RAMMAC supplier database. In this research, RAMMAC supplier development program means its narrow meaning, that is, RAMMAC supplier database.

solutions. One maquila plant answered the implementation of the project like “Development of technological center<sup>2</sup>.” The other maquila plants answered better organization for local business.

For the question, “Have you heard about Cluster,” seven maquila plants (77%) answered yes, and one maquila plant (22%) answered no. For the question, “Has your plant joined to Cluster (e.g. automotive, aerospace, IT cluster etc),” six maquila plants (66%) answered yes. One maquila plant (11%) answered no. Two maquila plants (22%) answered that different plants of the same company in the same region joined the cluster program. The sample maquila plants are participants of the electric-electronics cluster program, so, the recognition of the cluster program and the rate of joining the cluster program seem high. For the question, “Do local Mexican suppliers join the same Cluster,” two maquila plants (22%) answered yes. One maquila plant (11%) answered no. Six maquila plants (66%) did not answer or skipped (no information). The response rate is not high. For the question, “Is there any benefit to your plant from joining the Cluster,” six maquila plants (66%) did not answer (no information). The response rate is not high. One maquila plant (11%) answered yes. Two maquila plants (22%) answered no, not yet. Two maquila plants (22%) answered the benefits. For the benefits, one maquila plant answered collaborative impact, and the other maquila plant answered any improvement in supply chain management. For the question, “What are the problems with the Cluster? How can the Cluster develop,” five maquila plants (55%) did not answer or skipped (no information). The response rate is not high; four maquila plants (44%) answered problems and developmental directions. For the problem or developmental direction, each one maquila plants (25%) answered the following answers - organizing, sharing the information with competitors, negative consecutive effect (if one of the cluster suppliers obviously will run short of material that will impact all of the

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<sup>2</sup> The purpose of this project is to supply technicians to maquilas. Local universities and maquilas collaborate for this project. This project is to the core content of current electric-electronics cluster of Reynosa. A maquila has the initiative.

suppliers, which in turn, supply the end user) and general conversation about the economy or the environment or the state of Texas. It is not actually helpful to the industry. Exhibit 54 presents the answers of maquila plants to problems and solutions for RAMMAC supplier development program (supplier database) and cluster program.

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Problem and solution for RAMMAC supplier development program (supplier database)

(1) In the project of “Development of Technological Center”, the process required for all people is found.

(2) I believe it could be better. It could be stronger. I think it could be better with just better organization. Better organization for local businesses.

Problem and solution for cluster program

(1) Organizing, cluster program needs to be not well organized.

(2) Need to ensure competitors are not in cluster. (Sharing information is a whole idea. However if competitors join the same cluster, the sharing of information may be limited).

(3) If one of the cluster suppliers, you know, obviously runs short of material, that’s gonna impact all of the suppliers, which in turn, supply the end user.

(4) The Cluster program needs to be more oriented to helping manufacturing companies improve their process, improve themselves, or introduce to new companies how to improve new processes, as opposed to a general conversation about the economy or the environment or the state of Texas or stuff like that. Maquila expectation is to be able to go to that and learn from other suppliers, learn new technology, or be able to sell ourselves, like o.k. here’s what we can offer to third party manufactures, it seemed that there was no opportunity to do that.

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Exhibit 54 Response to the question : How can RAMMAC supplier development program (supplier database) and cluster program develop?

Purpose : To determine the problem and the solution to develop RAMMAC supplier development program (supplier database) and cluster program (Maquila plant)

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**Local Mexican supplier responses.** For the question, “Do you know RAMMAC,” thirteen local Mexican suppliers (81%) answered yes. Three local Mexican suppliers (18%) answered no.

For the question, “Do you know the RAMMAC supplier development program or RAMMAC supplier database,” ten local Mexican suppliers (62%) answered yes, and five local Mexican suppliers (31%) answered no. One local Mexican supplier (6%)’s answer is missing. For the question, “Does your company join the RAMMAC supplier development program,” nine local Mexican suppliers (56%) answered yes, and four local Mexican suppliers (25%) answered no. Three local Mexican suppliers (18%)’ answers are missing. For the question, “Does the customer maquila plant join the RAMMAC supplier development program,” two local Mexican suppliers (12.5%) answered yes, and one local Mexican supplier (6.25%) answered no. Thirteen local Mexican suppliers (81.25%) did not answer or skipped (no information). The response rate is low. For the questions - What are the problems with the RAMMAC supplier development program? How can the RAMMAC supplier development program advance?” thirteen local Mexican suppliers (81.25%) did not answer or skipped (no information). The response rate is low. Three local Mexican suppliers (18.75%) answered the comment for development. Each one of the local Mexican suppliers answered the increment of working areas or type of service for maquila. One local Mexican supplier answered more interaction, but it could be on a more personal level (e.g. feedback from competitors or friends) in local supplier’s database. One local Mexican supplier answered specific classification of suppliers with more specific requirements of maquilas about the process.

For the question, “Have you heard about Cluster,” six local Mexican suppliers (37.5%) answered yes. Ten local Mexican suppliers (62.5%) answered no. For the question, “Has your company joined Cluster (e.g. automotive, aerospace, IT cluster etc),” three local Mexican suppliers (18.75%) answered yes. Thirteen local Mexican suppliers (81.25%) answered no. For the question, “Does the customer maquila plant join the same Cluster,” three local Mexican

suppliers (18.75%) answered yes and one local Mexican supplier (6.25%) answered no. Twelve local Mexican suppliers (75%) did not answer or skipped (no information). The response rate is low. For the question, “Is there any benefit to your company from joining the Cluster,” four local Mexican suppliers (25%) answered yes. Twelve local Mexican suppliers (68.75%) did not answer or skipped (no information). The response rate is low. For local Mexican suppliers’ benefit answers, each one of the local Mexican suppliers (25%) answered various benefits as follows: improvement and extension of company’s coverage, customer list, interaction with maquila customers, making members be closer to each other (suppliers can sell easier, and maquilas can be more productive and time saving). For the questions - What are the problems with the Cluster? How can the Cluster develop?, twelve local Mexican suppliers (75%) did not answer or skipped (no information). The response rate is low. Ten local Mexican suppliers (6.25%) answered no problem, no comment for development. Three local Mexican suppliers (18.75%) suggested comments for development. Each local Mexican supplier answered the following solutions - more specific industry classification, regular meetings with customer plant departments like technical purchasing agents and too many supplier membership conditions - certifications and training (Total 2 - 3 years). Exhibit 55 presents the answers of local Mexican suppliers to problems and solutions for RAMMAC supplier’s development program (supplier database) and cluster program.

**Local government responses.** For the question, “Have you heard about Cluster,” government officers answered yes. For the question, “Has your organization joined Cluster (e.g. automotive, aerospace, IT cluster etc),” two government officers answered yes. They joined electric-electronics cluster program of Reynosa, Tamaulipas. For the question, “What is the benefit of Cluster,” the Tamaulipas government officer said exchange of information, best

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Problem and solution for RAMMAC supplier development program (supplier database)

- (1) The increment of working areas or type of service for the maquiladoras or manufacture.
- (2) More interaction but it could be on a more personal level (e.g. feedback from competitors or friends) in the local supplier database.
- (3) The necessity is more specific division (or classification) of suppliers with more specific requirements of maquilas about the process.

Problem and solution for cluster program

- (1) There is no specific problem, if yes, for various industries, it is difficult to work together with everyone. How can the Cluster develop? If we join the cluster, we need to divide into specific industries.
- (2) Regular meetings with customer plant departments like technical purchasing agents and more reflection of industry specific requirements is necessary. That is, technical purchasing agents or materials related direct weekly meetings to find the required materials.
- (3) Cluster program is the way to work; my opinion is that you should have meetings. when you come to industry you need a technical purchasing agent to understand what they are buying so in order for the cluster to work you need some type of biweekly meeting ... sit down and they talk about the different materials that they're buying and see what's happening in the market, what are they lacking...
- (4) A lot of problems. Especially for supplier participation for the aerospace cluster program, there is a requirement of lots of training or certification (kind of quality certification of aerospace) It takes a long time, about 2 or 3 years.

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Exhibit 55 Response to the question : How can RAMMAC supplier development program (supplier database) and cluster program develop?  
Purpose : To determine the problem and the solution of RAMMAC supplier development program (supplier database) and cluster program (Local Mexican supplier).

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practices and technology leverage with suppliers and services among others. The Reynosa government officer said technician education and training for maquila needs. For the question - What are the problems with the Cluster? How can the Cluster develop?, one local government

officer said, the first is cluster organization standpoint. For this point, it is participation. The second is inside Cluster joining companies. For this point, it is a lack of training (technicians and engineers) and lack of specialized professionals supporting specific programs. The other local government officer said working on groups. It can coordinate participants (companies)' similar but their own specific needs. So, they need to get a middle point.

**Local university responses.** For the question - Have you heard about Cluster? Has your organization joined Cluster (e.g. automotive, aerospace, IT cluster etc)? two local university officers answered yes. For the question, "What is the benefit of joining the Cluster," the first local university officer said better education so there can be better positions outside and donations from cluster industry participants (companies), like financial support and equipment. The second local university officer said to be in contact with the maquiladora industry and that students at the universities are provided for in maquila industries. Maquila industries' training needs are filled. New information like new technology is also one benefit. For the question,- What are the problems with the Cluster? How can the Cluster develop? the first local university officer answered there is no problem; the current cluster is in the beginning stage. The second local university officer answered that the difficulty with the cluster is its ability to get together with different companies and different universities; they want benefits. For the solution to overcome the difficulties, the second local university officer comments that probably it is to change the culture and to develop trust among the different companies, among the universities, to benefit everybody. Exhibit 56 presents local government's and local university's answers to problems and solutions for cluster program.

**RAMMAC responses.** For the RAMMAC supplier development program, for the question, "What is the purpose (or motive)," RAMMAC director answered to support maquilas. It is an

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Problem and solution for cluster program

Government

(1) From a Cluster organization standpoint – the problem is participation. From inside the cluster joining companies - the problem is a lack of training (technicians and engineers lack specialized professionals supporting specific programs).

(2) Working on groups - participants (companies)' are similar but have their own specific needs; they need to get a middle point.

University

(1) There is no problem (The current cluster program is in the beginning stage)

(2) The difficulty with the cluster is being able to get together with different companies and different universities; they want benefits. For the solution to overcome the difficulties, it is probably to change our culture, developing the trust among the different companies, among the universities, to benefit everybody.

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Exhibit 56 Response to the question : How can cluster program develop?

Purpose : To determine the problem and the solution of cluster program  
(Local government and Local university)

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association and to look for improving the service of RAMMAC members. It is to provide business opportunities for RAMMAC members and local Mexican suppliers. For the question, "What is the content," RAMMAC director answered, building the electronics cluster program. For the question, "What are the problems (or difficulties)," RAMMAC director answered some maquilas need to find suppliers and all products related to maquilas' needs. However, the current supplier development program or cluster program is only about (university) education for technical people to support maquilas. A direct supplier development program is the next level.

For the question, "Does RAMMAC join the Cluster program (e.g. automotive, aerospace, IT cluster etc)," RAMMAC director answered yes, the electric-electronics cluster. For the question,



“What is the benefit of joining the Cluster program,” RAMMAC director answered it is to have people and a level up of education of the maquila industry and to work on developing program of state. For the question, “What are the problems (or difficulties) with the Cluster program,” RAMMAC director answered that this program is starting or making progress. For the question, “How can the Cluster program develop,” RAMMAC director answered that the next level of focus is local Mexican suppliers. The next levels are education, supplier development and cost.

In summary, for RAMMAC, the recognition of local Mexican suppliers and maquila plants are all high. However, for the RAMMAC supplier development program (supplier database), the recognition is not high. Local Mexican suppliers’ recognition is a little bit higher than the maquila plant. It can be related that sample suppliers are listed in the RAMMAC supplier database though there are sample suppliers that do not know they are listed in the supplier database. For the development of the RAMMAC supplier development program (supplier database), the following suggested are primary recommendations: the increment of the type of service for maquilas and more specific classification of suppliers about the process and requirements of maquilas.

Overall, the maquila’s recognition of the cluster program is high. Almost all sample maquila plants joined the program, especially the electric-electronics cluster program of Reynosa. So, this can be related. However, local Mexican suppliers do not know the cluster program well, that is, the frequency of the answer that local Mexican suppliers know the cluster program is low. Also, they do not know if their partners (maquila plants or suppliers) joined the program or not. Overall, the cluster program is in the beginning stage. For the development of the cluster program, the following is suggested as primary recommendations: more helpful interaction for actual industry needs instead of general economic talk, more specific industry classification and

regular meetings between local Mexican suppliers and maquila plant departments (e.g. technical purchasing agent).

### **Overall Solution for Capability Development of Local Mexican Suppliers**

As a wrap up, the overall solutions or suggestions for the capability development of local Mexican suppliers were asked straightforwardly.

**Maquila plant responses.** For the question, “How can capabilities of local Mexican suppliers increase,” eight maquila plants (88%) answered the solution and one maquila’s answer (11.11%) is missing data. Three maquilas(33.33%) answered investment in education. Two maquilas (22.22%) answered investment in technology. Three remaining maquila plants answered various solutions. Exhibit 57 presents the answers of maquila plants.

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(1) One of their needs is training their people. In the very beginning, the automotive industry was not the same compared to plastic ... 5 or 10 years ago, we chose one socket. In this area, there was a plant that produced a socket. There was a problem. They never had produced an automotive product. They were willing to do business with us but they didn’t understand the specific picture of the product and what the automotive industry meant. So I think, capability truly increases, first of all, when they really understand the environment for which they want to apply and not just apply to try to get business because that can bring problems rather than opportunities.

(2) Investment in automation. Investment in people, equipment and the facility. Finally, investment in automation makes people become more technical. There are many ways to invest. One is in the people and one is in equipment and the facility. So, as people invest in automation, then yeah they are gonna become more technical.

(3) More involved in maquiladora supplier’s program. Continuous update or increase for various products as well as representative products.

(4) Increasing production and income. Learning about how to improve their internal processes such as reducing cost and getting more profits. (Continued on next page)

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Exhibit 57 Response to the question: How can capabilities of local Mexican suppliers increase?  
Purpose: To determine the overall solution to increase the capability of local Mexican suppliers (Maquila plant).

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(5) I don't know specifically. However, I think pure local Mexican suppliers just have to keep doing what they're doing. That is, it takes a little bit time.

(6) For the opportunities, the individual effort or the individual mind changes. This type of mind will be better

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Exhibit 57 (continued)

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**Local Mexican supplier responses.** For the question, "How can the capabilities of local Mexican suppliers increase," fifteen local Mexican suppliers (94%) answered the question. One local Mexican supplier's (11.11%) answer is missing. For the question, six local Mexican suppliers (30%) answered more business with maquilas and learning through time and experience by dealing with maquilas. This is the most frequent answer. Next, each three local Mexican suppliers (15%) answered - investment in technical advancement and investment in workers training. Next, two local Mexican suppliers (10%) answered the resolution of corruption. Each one of the remaining local Mexican suppliers (5%) answered various solutions. Exhibit 58 presents the answers of local Mexican suppliers.

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(1) Generally I mean, more business increases business and can help to increase capabilities most definitely. *Generating more business means, local suppliers must do more business, more actively (Interviewer)* Yes. Do more business. *More business means, more interaction with maquila plants and more interaction means more learning (Interviewer)\_right, exactly, more learning (Interviewer),* definitely. You know, learning every day, you know, how maquilas run the operation because of course I mean they run very lean operations. *Before, you said, people issue, low level, how to solve this issue? Your idea? (Interviewer)* Skill level? *Local suppliers (Interviewer),* yes. how to say, training center type. Type of local training or in Texas, something local, because a lot of training centers you find up North are far from here. What we do here is label manufacturing; that would be something that would help most definitely to increase skill capabilities. (Continued on next page)

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Exhibit 58 Response to the question : How can capabilities of local Mexican suppliers increase?  
Purpose : To determine the overall solution to increase the capability of local Mexican suppliers (Local Mexican supplier).

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*Local training center, your company sent employees to a special school in the United States. Local side training centers will be helpful (Interviewer) oh yeah, most definitely.*

(2) A lot of capacity here, a lot of technical advancement that local suppliers didn't develop.

(3) Extra investment and trust from the final use of the product. They produce so that you can be done. there is a lot of capacity here. there is a lot of technical advancement that we didn't develop. we ... from outside. there are a lot of people who got training in establishing maquiladoras so there are a lot of people who know how to start a supply base with technical high positions, good cost, and soft products for maquiladoras, so the only thing we need is trust and I guess money to start the business.

(4) For corruption, maquiladoras, suppliers (and distributors) need to communicate.

(5) Being better and providing the best price and the best product. This is related to providing what the customer wants.

(6) Getting cheap money (*In other words, getting fund or money for investment more easily*).

(7) Most maquilas show characteristics of assembly. Local Mexican suppliers are primarily used for maintenance parts. These are limitations for the capability development of local suppliers.

(8) Be more competitive.

(9) Certification for making or transacting products is necessary with government monitoring.

(10) Through constant betterment and investment increases.

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Exhibit 58 (continued)

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**Local government responses.** The first local government officer answered the solution is to provide training and incentives for investment. The second local government officer answered the solution is as follows: financial capability depends on government support, managerial capability depends on local Mexican suppliers, technological capability depends on what local Mexican suppliers sell or which capability local Mexican suppliers need. Also, the government's support is possible for technological capability, especially on the financial side.

**Local university responses.** The first officer answered to continue to improve with ongoing training and to watch the development and the growth of the industry. The second officer answered education and government support. Exhibit 59 presents the answers of local government and local university.

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### Government

(1)By providing training and incentives for investment, the electronic segment, for example, does require a specialized supplier base to develop equipment and customized services.

(2)For financial capability, they need government support (e.g., Nacional Financiera program), for managerial capability, it depends on local Mexican suppliers, university degree, for technological capability, it depends on what local Mexican suppliers sell or which capability local Mexican suppliers need. Also, government support is possible, especially financial side for technology, machine, and training.

### University

(1)With ongoing training, continuous improvement and watching the development and growth of the industry.

(2)Education and government support. That is, training of technical knowledge and government support for the initial stage of a startup, especially on the financial side.

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Exhibit 59 Response to the question : How can capabilities of local Mexican suppliers increase?  
Purpose : To determine the overall solution to increase the capability of local Mexican suppliers (Local government and Local university).

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In summary, overall local Mexican suppliers recognize more business with maquilas, learning from them, investing in technical advancement and workers training as important solutions to increasing their capability. Maquilas, local governments and local universities also emphasizes overall training (or education primarily in people and technology), cluster programs and government support (especially financial).

## **The Initiative Role for Capability Development of Local Mexican Suppliers**

**Maquila plant responses.** For the question, “Who should have an initiative role to develop capabilities of local Mexican suppliers? Government? Maquila plants? Educational institutes? or Local Mexican suppliers themselves,” each four maquila plants (28%) answered local Mexican suppliers and maquila plants. Three maquila plants (21%) answered government. Two maquila plants (14.28%) answered all sectors are important. And one maquila plant (7.1%) answered educational institutions. Overall, maquila plants answered local Mexican suppliers and local government in the similar extent of initiatives. On the other hand, the educational institute is not a strong sector.

**Local Mexican supplier responses.** Seven local Mexican suppliers (43%) answered local government. Six local Mexican suppliers (28%) answered maquila plants. Each three local Mexican suppliers (18%) answered local Mexican suppliers and educational institutes. Two local Mexican suppliers (12%) answered all sectors. Overall, local Mexican suppliers answered that local government and maquila plants are more important than local Mexican suppliers and educational institutes.

**Local government, local university and RAMMAC responses.** The first local government officer says all sectors; the other local government officer says local Mexican suppliers, maquilas and government. The first local university officer answered all sectors, and the second local university officer answered government, maquiladora and educational institutes. RAMMAC director answers all sectors are important.

In summary, considering all the answers of respondents, local government and maquila plants, each twelve countings, so these are the highest frequency. Local Mexican suppliers, eight

countings, second frequency, educational institutes are five countings, fourth frequency. The answer that all actors are important is seven countings, third frequency.

Conclusively, local government and maquila plants are recognized as the most strong initiative role for capability development of local Mexican suppliers. Next, local Mexican suppliers and all sectors are in the similar frequency. Local government and maquila plants are recognized as important to a similar extent and are recognized as more important than local Mexican suppliers. Relatively, educational institutes are not recognized as a strong initiative position. Also, maquila plants recognize local Mexican suppliers as important initiative role positions, but local Mexican suppliers recognize themselves as holding a less important initiative role than maquila plants and local governments.

## CHAPTER V

### FINDINGS, IMPLICATIONS AND LIMITATIONS

Chapter five includes the summary of findings, the theoretical implications, the policy implications and limitations and future researches.

#### **Study Findings**

##### **Proposition One:**

**Entrepreneurial activities in maquila plants have a positive effect on the capability development of local Mexican suppliers.**

The support for this proposition is mixed. There are entrepreneurial activities in the maquila plants. These are continuously improving the manufacturing process. The purposes are primarily efficiency and quality. In detail, the activities are primarily enhancement of production lines and partly new corporate investment in R&D and manufacturing attracted by plant management. The economy on the border (especially due to the ongoing economic slowdown) tends to strengthen these activities. Recognition of new market opportunities and product development are not the strong phenomenon. For new startup maquila of small and medium sized MNC, if this type of maquila tries an independent survival for other maquilas, as well as internal improvement in the plant, it recognizes new market opportunities and can create new business (e.g. new industry entry). However, in this research, this is difficult to support because of limited data (one maquila). There is no strong linkage between entrepreneurial activities in the maquila plants and the capability development of local Mexican suppliers. However, local Mexican suppliers learn



the process from maquila plants. The more entrepreneurial activities in the maquila plants, the more business opportunity of local Mexican suppliers. Therefore, entrepreneurial activities in the maquila plants can potentially have a positive effect on the capability development of local Mexican suppliers.

**Proposition Two:**

**Capability development of local Mexican suppliers has a positive effect on entrepreneurial activities in maquila plants.**

The support for this proposition is mixed. Maquila plants learn from and do business with various sizes and types of local Mexican suppliers. The learning content of maquila plants from local Mexican suppliers includes process improvement as well as local culture. So, capability development of local Mexican suppliers can potentially have a positive effect on entrepreneurial activities in the maquila plants. However, the extent of learning about maquila plants can be lower than that of local Mexican suppliers, therefore, the extent of the effect can be also lower for the reverse.

**Proposition Three :**

**Governance structure between maquila plants and local Mexican suppliers and local embeddedness of maquila plants moderate the relationship among entrepreneurial activities in maquila plants and capability development of local Mexican suppliers.**

The support for this proposition is mixed. For the governance structure between maquila plants and local Mexican suppliers, the network structure is stronger than the market and hierarchy structures. This seems to be because of the characteristics of materials and proximity benefits. That is, the materials of local Mexican suppliers are mostly indirect materials and partly direct materials. Maquilas transact with local Mexican suppliers because of proximity benefits

such as flexibility as well as market price. Additionally, for the necessary or important capabilities, half of local Mexican suppliers answered that there is assistance or interaction from maquila plants. Half of local Mexican suppliers do not recognize that this transaction type affects their capabilities. For the relationship among entrepreneurial activities in the maquila plants and capability development of local Mexican suppliers, the effect of the governance structure is the mixed result of effect and no effect. The commitment of maquila plants to the local community is shown primarily by employee benefits. This is to lower the turnover rate, but because maquila plants employ many local people, becomes the commitment to the local community. For the the relationship among entrepreneurial activities in the maquila plants and capability development of local Mexican suppliers, this characteristic of the local embeddedness of maquila plants is not related.

**Proposition Three and Three Dash One :**

**Hierarchical governance structure between maquila plants and local Mexican suppliers coupled with low local embeddedness of maquila plants has a negative effect on the relationship among entrepreneurial activities in maquila plants and capability development of local Mexican suppliers.**

This proposition is not supported. Hierarchical governance structures between maquila plants and local Mexican suppliers are not strong. The characteristic of the local embeddedness of maquila plants primarily for employee benefits is not related to the capability development of local Mexican suppliers.

**Theoretical Implications**

For maquila plants located in Reynosa, factors such as the low labor wage and proximity to the United States market, and as a result, the low transportation (logistics) costs, are still strong

merits. Therefore, recognition of new market opportunity and independent business as a subsidiary of multinational corporations is not a strong phenomenon. That is, on the border, rather than enhancements to products (or product development), the continuous improvement of activities in the manufacturing process are implemented, primarily for efficiency and quality. The border economy (especially recession) strengthens these activities. This is a primary characteristic of entrepreneurship in the MNCs in the border. Only new startup maquila of small and medium sized MNC shows different characteristic compared to the maquila plant as a subsidiary of large MNC. They catch new market opportunities and do new business as well as internal improvement activity in the plant.

Additionally, the personal life of top management (e.g., immigration issues - local settlement in the United States) can enhance this trend. Because there is information on one maquila plant in this research, this is difficult to support. However, these maquila plants can show different patterns of entrepreneurship in MNC on the border. These findings give the empirical extension to the theory of entrepreneurship in MNCs for the U.S-Mexico border region.

Most local Mexican suppliers learn from maquila plants. However, for the necessary or important capabilities of local Mexican suppliers, half of local Mexican suppliers answered that there is assistance or interaction from the maquila plant. Also, for the transaction type, the modular type is the most frequent. The relational type is the second most frequent with market type. Half of local Mexican suppliers did not answer that this transaction type affects their capabilities. Local Mexican suppliers show various learning contents such as process, product, plant management (security, safety etc), technology and managing people. Conclusively, local Mexican suppliers seem to do much experiential learning like observing or experiencing the project as well as cooperative learning. Also, local Mexican suppliers do both exploratory

(innovative) and exploitative (improvement) learning. Therefore, it is not accepted that cooperative-exploratory learning is strong to local Mexican suppliers because of poor resources in the emerging markets. A prominent learning behavior is not clearly presented in this research. These points are the extension of and the contribution to the research about learning behavior of domestic firms for foreign entrants for the U.S.-Mexico border region.

As many local Mexican suppliers answer to learn from maquila plants, many local Mexican suppliers experience technological spillovers from maquila plants. (1) Local Mexican suppliers imitate maquila plants. They imitate processes like environmental management or cost reduction (e.g. lean production). So, the imitation effect as technological spillover exists. (2) If more maquila plants do business with local Mexican suppliers, the competition for quality and price will increase among local Mexican suppliers. However, the border economy, especially recession, forces the competition for the cost. The corruption in the border makes market functions based on quality and price not work well. So, competition can have the limited technological spillover effects. (3) Labor spillover effects exist. A few local Mexican supplier CEOs have job experience in maquila plants as managers. Therefore, their technological and managerial skills obtained from maquila plants were transferred to local Mexican supplier firms. (4) Linkage effects between maquila plants and local Mexican suppliers exist. That is, maquila plants push local Mexican suppliers to achieve new capabilities like environmental management processes. So, this requirement enforces the capability development of local Mexican suppliers. (5) Training effects also exist. Though all maquila plants do not do so, maquila plants train the related people in local Mexican suppliers primarily for the issues related to manufacturing. These evidences contribute to technology or knowledge spillover literature for the U.S.-Mexico border region.

For backward linkages between foreign affiliates and local suppliers, MNC subsidiary plants assist local suppliers technologically. Ivarsson and Alvstam (2007) suggest two types of technological assistance - product related assistance and process related assistance. In the research, for product related assistance, technical consultations and product performance feedback are implemented in the sample. For process related assistance, maquila plants implement it, such as machinery and equipment, quality management and so on. These factors are broadly related and implemented. Therefore, product and process related assistance all exists in the sample.

For the knowledge transfer mechanism (Ernst & Kim, 2002), the sample maquila plants and local Mexican suppliers show that market mediated knowledge transfer is not strong. Non-market mediated knowledge transfer is more strong. That is, maquila plants give technical assistance and local Mexican suppliers learn many things such as processes related to manufacturing by observing or imitating informally. These non-market mediated knowledge transfer mechanisms exist in the sample data.

In this research, maquila plants learn from and do business with various types and sizes of local Mexican suppliers. The learning includes various contents such as process improvement as well as local adaptability. The maquila plant shows reverse knowledge spillovers (Feinberg & Gupta, 2004) that include the learning of local markets and institutional relationships. At the same time, maquilas show more various learning contents from local Mexican suppliers.

### **Policy Implications**

#### **Strategy of Capability Development of Local Mexican Suppliers**

Maquila plants are primary customers for local Mexican suppliers. Maquila plants recognize the benefits of proximity as the most important motive to transaction with local Mexican

suppliers. Primary proximity benefits are flexibility and logistics. A flexibility benefit means to satisfy the maquila plants' needs to respond to the change of customer needs rapidly. For this purpose, inventory management like just-in-time and short lead time is necessary. Logistics benefits refer to the rapid delivery and the low transportation cost. Compared to foreign suppliers, local Mexican suppliers can give these proximity benefits. Interestingly, maquila plants recognize proximity benefits as a more important motive than cheap price. Therefore, the benefits of proximity need to be the key driver for supplier development.

On the other hand, local Mexican suppliers need to overcome a few primary weaknesses. The first weakness is the technical side. Maquila plants recognize the selected limitation. That is, it is the lack of product variety in the same industry and the lack of industry variety. Education and investment for the improvement of product and industry variety are necessary. Furthermore, the improvement of technology or product quality can be considered in a similar context. The second weakness is the cultural and ethical side. The high commitment to partners reversely is a negative cultural aspect in the transaction, such as the delay of appointments (e.g. delivery). Maquila plants recognize this cultural factor as difficulty in the transaction. Furthermore, corruptive actions (e.g. bribe under the table) damage both maquila plants and local Mexican suppliers. That is, corruptive actions can hinder the competition based on product quality and make the company go bankrupt. Therefore, these cultural and ethical aspects need to be improved by educating and training, primarily at the corporate and government level. The third is the financial side. The border economy is affected by the economic cycle in the United States. It is a main point to overcome the financial difficulty in the recession. When maquila plants have financial difficulties, local Mexican suppliers endure those financial situations with difficulty (e.g. delay of payment) and may go bankrupt. Also, this financial fragility of local Mexican

suppliers can hinder investment and education. Because local Mexican suppliers are not easy to receive support from the private sector, the public sector (government) needs to continue to support and educate local Mexican suppliers (e.g. access to financial institution and education of financial management).

Though some interviewees show negative opinions because of some factors, such as the characteristics of the border economy (i.e. economic cycle), corruption, narrow service scope and dependence on foreign methods and technologies, almost all interviewees recognize that the capability of local Mexican suppliers increased with the upgrading of maquila plants. Furthermore, there is an interviewee who answered no opportunity to local Mexican suppliers because there is no investment in the maquila because of the recession, However, almost all interviewees recognize that with the upgrading of maquila plants, local Mexican suppliers have the opportunity. The opportunities are primarily more business with maquilas and learning new knowledge from maquilas. One local Mexican supplier interviewee gave a good summary of the opportunities as follows. First, from a business standpoint, local Mexican suppliers can get additional revenue streams and business opportunities due to a growing demand by maquila plants. Second, local Mexican suppliers are exposed to the latest technology brought in by the maquilas. The continuous interaction with maquila plants will allow local Mexican suppliers to inherit knowledge that would otherwise not have been available through formal schooling, books, etc. That is, the more business done with maquilas, the more opportunity there will be of developing the capability development of local Mexican suppliers. Most interviewees agree with this point. Therefore, more business, interaction or opportunity with maquilas is a key driver for supplier development.

Additionally, threat factors exist with the upgrading of maquilas. One local Mexican supplier gave an insightful comment about the threat as follows. New methods or technologies brought by maquila plants may be far more advanced than local suppliers and as a result may inhibit local Mexican suppliers from competing in their own local market. Also, over reliance on foreign methods and technologies may suppress innovation and creativity of local Mexican suppliers. In a similar context, another interviewee answered that many small grocery stores in Mexico changed to Seven Eleven stores. The risk of dependence needs to be considered.

Also, the economic cycle in the border (especially recession) is one important threat. Two interviewees gave insightful comments about this treat. They explained that because of low manufacturing costs, many maquila plants can enter this region and as a result, local Mexican suppliers can have the opportunity to do business. At the same time, the threat is related to the unsecure economic environment from the recession. Companies may have to cancel investments or lose business opportunities for the lack of capital. In other words, the recession provokes maquila plants to go away or take them out because of the lack of financial security. As a result, the business opportunity of local Mexican suppliers with maquilas decreases. Unsecure economic environments can hinder the investment and education of local Mexican suppliers. Therefore, the unsecure economic environment resulted from the economic cycle on the border (e.g. recession) tends to hinder the opportunity and the investment of local Mexican suppliers. How to react to (or buffer) this financial insecurity is an important issue for supplier development. For this purpose, government financial support for local Mexican suppliers and maquilas is necessary and needs to continue. Additionally, personal insecurity (e.g. border crimes) can affect the entrance and the exit of maquilas. For this purpose, government control is necessary and needs to continue.



Considering these strengths, weaknesses, opportunities and threats, an overall direction of supplier development as a starting point can be drawn. Cluster programs as a collaborative effort among industry, academia and government can be helpful to implement the overall direction of supplier development. However, the cluster program is currently at the beginning stage. Member maquilas do not recognize the benefits strongly yet. The recognition of local Mexican suppliers for cluster programs is low. The driving force is the need of maquilas. In detail, the supply of technician (or engineers) is the current primary need of maquila plants. The focus is people. Collaborative works among maquilas and universities are primarily implemented. Supplier development is the next level plan. In this aspect, the RAMMAC supplier development program (supplier database program) is a good trial to connect maquilas and local Mexican suppliers. Overall, more maquilas need to join the cluster program and their specific requirements are necessary to be coordinated. More local Mexican suppliers need to know and join the cluster program. For this purpose, the following interviewees' recommendations are necessarily reflected. That is, the first recommendation is more helpful interaction for actual industry needs instead of general economic talk. The second is more specific industry classification and regular meetings between local Mexican suppliers and maquila plant departments (e.g. technical purchasing agent).

For the RAMMAC supplier database as the connection between maquila plants and local Mexican suppliers, the following interviewees' recommendations are necessarily reflected. That is, the first is the increment of working areas or type of service for maquilas. The second is more specific classification of suppliers with requirements of maquilas about the process or service. Conclusively, cluster programs and RAMMAC supplier development programs (supplier database) are collaborative works among maquilas, suppliers, university and government. These

programs can be helpful to implement the overall direction of supplier development reflected in the SWOT (Strength, Weakness, Opportunity and Threat) analysis, even though the current status is in the beginning stage.

Absorptive capacity is important to knowledge or technology spillover of local Mexican suppliers from maquila plants. Most local Mexican suppliers evaluate their absorptive capacity positively, however, maquila plants, local government, local university and RAMMAC's evaluations are mixed. So, in this research, it is not clear how the absorptive capacity of local Mexican suppliers contributes to knowledge or technology spillover. To increase the absorptive capacity is an important issue for supplier development. Overall, training and educating people, financial support and more business and learning from maquilas are suggested as primary solutions. In a similar context, a cluster program is suggested as a solution.

In a similar aspect of the increase in the absorptive capacity, for the overall solution of capability development of local Mexican suppliers, local Mexican suppliers recognize primarily two sides. The first is more business and learning from the maquilas' investment. The second is the investment in the technical advancement and training of workers. Additionally, government supports such as the cluster program and financing are recognized as important. In detail, technological and managerial capability are recognized as mixed. Financial capability is recognized as low. Considering the characteristics of capability, maquila plants can support more technological capability. Government can support more financial capability. Local Mexican suppliers can have a more initiative role for more managerial capability.

For the border environment as an important factor for the capability development of local Mexican suppliers, the following can be suggested with the interviewees' comment. First, the border security continues to be improved. This affects the entrance of more foreign firms and

overall skill level of people. Second, more investment in technology and education is necessary. Third, more business friendly environments need to be established. The example is the easier availability to finance, technology, asset and equipment. This facilitates new suppliers as entrepreneurs on the border. Fourth, better logistics (or infrastructure) environment (or border infrastructure environment) is necessary for more interaction between cities. Fifth, the corruption issue needs to be solved.

Issues about the border environment are necessary to be discussed more because of its effect on the capability development of local Mexican suppliers as constraints.

### **Constraints in the Border for Capability Development of Local Mexican Suppliers**

**Recession.** The border economy is strongly affected by the U.S. economy. The economic cycle in the United States, especially the recession, affects all related sectors - local Mexican suppliers, maquila plants, local government and local university. Almost all interviewees answered that they experience the effects of the recession. Therefore, for the recession or more broadly, the economic cycle in the United States, how to react is very important for supplier development.

Because of low manufacturing costs, maquilas enter the border region, but compared to the expansion, in the recession maquilas experience a lack of capital. As a result, maquilas can cancel the investment, loosen the business opportunity or leave out the border. The business opportunities of local Mexican suppliers with maquilas decrease. In the recession, local Mexican suppliers experience the lack of capital and the difficulty in accessing the capital market. Therefore, this brings bankruptcy and hinders investment and education. This is a kind of financial insecurity. Governments need to keep financial security in the border. Government can support maquilas and local Mexican suppliers financially in the recession. Actually, the Mexican

government implements “Nacional Financiera” institution. This is kind of developing banking institution (Nacional Financiera, 2008). Through this program, when a maquila delays payment to local Mexican suppliers, especially in the recession, local Mexican suppliers can first receive payment from the government; later maquilas can pay the government. These types of government support for financial security on the border need to continue.

**Corruption.** Corruption is “the improper use of resources, such as bribery, nepotism, extortion, use of privileged information, fraud, and others for nonofficial purposes” (Halter, Arruda, & Halter, 2009, p. 375). It is said that corruption is widespread in Mexico. But in this research, the number of maquila plants and local Mexican suppliers that experience corruption is small. Also, for the local Mexican suppliers that experience corruption, they are the primary ones who compete with distributors or local Mexican firms. Therefore, the actual effect of corruption seems to have a different effect to local Mexican suppliers and maquila plants on the border.

However, corruption hinders the capability development of local Mexican suppliers. That is, competition based on product quality in the market is more difficult and local Mexican suppliers may go bankrupt. Furthermore, maquilas recognize ethical and cultural factors, such as corruption, as a primary weakness of local Mexican suppliers. Therefore, the corruption on the border is a cultural insecurity. To combat corruption, corrective actions are necessary. First, the Mexican business culture that resulted in corruption (buddy-buddy system, favor for cheap price and re-investment of profits in the personal wealth instead of the business etc) needs to change. This change facilitates the market system to work. Second, efforts on the corporate level are necessary. The corporate level controls are as follows; ethical training of employees and furthermore suppliers, corporate internal process to protect the corruption about selection of suppliers and transaction with suppliers and the control over the personnel. One interviewee gave

good recommendations about the control over the personnel. When they do hire, it is necessary to select the best person. They have no criminal record neither him nor his family member and second generation (Database). Additionally, it is necessary to be able to identify the bad elements and avoid godfather and friendship preferences. Third, communication among maquilas, local Mexican suppliers and distributors is necessary to stop corruption. For this communication channel, local government and RAMMAC can be involved and help the corrective action. Fourth, government organizations like the chamber of industry and transformation will work towards eliminating the corruption (e.g. education and support). For this purpose, central government organizations (e.g. the secretary of economy) can support (back up) that this type of organization works properly. One more thing, there is the recognition that the government sector in Mexico is corrupt. Actually, two interviewees commented on the corruption of government in Mexico. However, the topic of the corruption of government in Mexico is out of scope on this study. Overall, more interviewees recommend the corporate level control. Thus, the corporate level control can be primary control.

**Border Security.** A few maquila plants interviewees commented on border security as an important factor in the border environment for the capability development of local Mexican suppliers. However, overall, border security is not strongly indicated as important factor in the border environment for capability development of local Mexican suppliers to local government, and local university, RAMMAC and local Mexican suppliers. Border security or border crimes affect the border business such as foreign firms' entrance and exit and overall skill level of people on the border. In other words, border security means personal insecurity. However, it seems to be an influence and not an urgent issue that local Mexican suppliers or maquilas solve immediately. For the border security of maquilas and local Mexican suppliers, the C-TPAT

program is implemented by governmental organization (CBP.gov: Securing America's Borders, 2007). The C-TPAT program is to control the supply chain in the border. The overall purpose of C-TPAT program is to strengthen and improve the international supply chain and U.S. border security. Voluntary cooperative relationships between business and government are fundamental for this program.

Maquilas or local Mexican suppliers find it difficult to have an initiative role to solve the issue of border security. Also, despite border crimes, the business on the border continues. Overall, the government has the initiative role to solve the border security. The government needs to continue the control.

In conclusion, these constraints tend to hinder the capability development of local Mexican suppliers as financial insecurity, cultural insecurity and personal insecurity. Interestingly, according to interview results, the strength of the effect on local Mexican suppliers is in the order of recession, corruption, and border security. That is, the recession affects all local Mexican suppliers and has the strongest effect. Corruption has a different effect to local Mexican suppliers and border security has the lowest effect.

### **Government Role as a Buffer for the Constraints on the Border**

The above constraints are financial, cultural and personal insecurity on the border. This insecurity hinders the capability development of local Mexican suppliers, especially in the long-term. This is a specific characteristic of the border. For the improvement, it takes a long time and the private sector's effort is not enough. Long-term intervention or effort on the government level is necessary. For these constraint factors, the government's buffering role is necessary.

### **Limitations and Future Research**

The present study has some limitations. These limitations imply that there is a need for future research. First, the study sample of maquiladoras needs to be larger. In this research, sample local Mexican suppliers show various characteristics - industry, region and size etc. On the other hand, sample maquila plants are participants of electric-electronics cluster programs and one other maquila that does business with one sample participant maquila. If more various maquilas (e.g. industry, size, year and nationality) are interviewed, more abundant results may appear, especially for entrepreneurship in MNCs.

Second, with the interview data and results, the survey research with a large size sample can be implemented. Primary variables in this research such as entrepreneurial activities in maquila plants, capability of local Mexican suppliers and learning can be measured precisely and tested statistically. The relationship among variables can be tested quantitatively.

Third, research can be done on more extended regions such as Monterrey and Guadalajara.

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## APPENDIX A

## APPENDIX A

### INFORMED CONSENT FORM (INTERVIEW) AND INTERVIEW QUESTIONS (ENGLISH VERSION)

The University of Texas – Pan American

Approved by

UTPA IRB  
(Expires: N/A)

#### Informed Consent Form – Interview

**[Study Title: Entrepreneurship in Multinational Corporations and Capability Development of Local Firms : An Exploratory Study in the US-Mexico Border Region]**

This research is being conducted by [Jung-Hoon Lim] from the University of Texas – Pan American /UTPA. We are conducting a research study about [capability building process of local Mexican suppliers]. As part of this study, we are interested in the views of [CEOs or managers in local Mexican suppliers and maquila plants in (or near) Reynosa, officers related to Reynosa supplier development program in university, state government and RAMMAC (Reynosa Asociación de Maquiladoras y Manufactureras, A.C.)]

We have invited you here today so that we can conduct an interview about issues related to this topic. The interview is expected to last approximately 30 to 60 mins. Your individual responses will be treated confidentially. Your participation is completely voluntary, although you have shown interest in participating in this study, you are free to withdraw from the interview at any time and can choose not to answer specific questions.

A number of the questions request information about the activities of the company that you work for. While published data will not link your responses to the company, we realize that there may be company policies that restrict the information that you are authorized to share. Please feel free to skip questions if you feel that sharing the information would be a violation of any company policies.

In order to ensure the accuracy of recorded statements, we will be recording the session on audio tape and later transcribing the tapes. The tapes will not be marked with your names and will be securely stored at UTPA. The recordings themselves will only be used for research purposes and will not be given to anyone not directly involved in the research. After 2 years, the tapes will be destroyed or erased.

Your responses may be quoted in whole or in part in publications or presentations based on this research. If quotes are used, your real name will be replaced by a made up name (pseudonym) and any additional information that might directly identify you will be excluded.

You must be at least 18 years old to participate in this research. If you are under 18, please let the researcher know before the session begins.

Researcher contact information:      Name: Jung-Hoon Lim, Doctoral candidate  
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This research has been reviewed by the Institutional Review Board for the Protection of Human Subjects (IRB). If you have any questions about your rights as a participant, or if you feel that your rights have been violated, please contact the IRB at 956-384-5004

## Local Mexican Suppliers

### I. Background information

1. Primary industrial sector (highest percentage of sales) \_\_\_\_\_
2. Primary product (highest percentage of sales) \_\_\_\_\_  
Primary service (highest percentage of sales) \_\_\_\_\_
3. Year of establishment \_\_\_\_\_
4. Number of employees \_\_\_\_\_

### II. Interview questions

1. Is the owner of your company Mexican?
2. Who is your customer? Is maquila plant your customer?

*\*If your companies never provide to maquila plants, please answer focusing on the customer who has the highest percentage of sales*

3. Who are the competitors of your company?

*\* The plant in the below means maquila plant or if your company never provide to maquila plant, it means the customer plant who has the highest percentage of sales*

4. Why does the plant transact with local Mexican suppliers?
5. For the plant, what is the percentage of purchase from local Mexican suppliers compared to other suppliers? Have the percentage changed?

*\* Approximate estimate is OK*

6. What are strength and weakness of local Mexican suppliers?
7. What capabilities are necessary to the product or service of your company?
8. How does your company obtain those capabilities?
9. Is there any assistance or interaction for those capabilities from the plant?
10. What is the transaction type between your company and the plant?

- (a) *Our company and the plant sell and purchase products or services by price in market. There is little interaction beyond transacting products or services for money.*
- (b) *Our company tends to take full responsibility for process technology and often uses generic machinery that applies investments to wide customer base. Our company satisfies with specific demands of the plant through codificative schemes in design and production. The cost of changing suppliers is low. There is little asset-specific investment that our company and the plant can use just for each other.*
- (c) *Our company and the plant have a mutually dependent relationship based on trust. This mutually dependent relationship took a long time to be formed. The cost of changing suppliers or rebuilding trustworthy suppliers is high. There is relatively much asset-specific investment that our company and the plant can use just for each other.*
- (d) *Our company depends on the plant. There is an unbalanced power relationship between our company and the plant. The plant monitors and controls the operations in our company. The cost of changing suppliers is high. Our company is specific by or to the plant.*
- (e) *Our company and the plant transact inside a single firm. Our company is managerially controlled.*

11. Does this transactional characteristic affect capabilities of your company?

12. What are the difficulties in transacting with the plant?

13. Many people comment the corruption in the transaction between maquiladora plants and local Mexican suppliers, especially in the relationship among maquiladora plants, local Mexican suppliers and distributors.

(a) What are the problems?

(b) How can the problems be solved?

14. To what extent does the plant commit to local community or contribute to the development of local community?

15. Does the commitment of the plant to local community affect capabilities of your company?

16. To what extent does your company learn from the plant?

17. What does your company learn from the plant?
18. To what extent is the absorptive capacity of your company?  
*\* Absorptive capacity is the ability to recognize the value of new information, assimilate it and apply it to commercial aims.*
19. How can your company increase the absorptive capacity?
20. Are there entrepreneurial activities in the plant?  
*\* Entrepreneurial activities in the plant are new products developed in the plant, enhancements to product lines in the plant and new corporate investments in R&D or manufacturing attracted by plant management*
21. Why are there entrepreneurial activities in the plant?
22. Are there any important factors (e.g. border environment) that affect entrepreneurial activities in the plant?
23. Do the entrepreneurial activities in the plant affect capabilities of your company?
24. Is the transactional characteristic between your company and the plant related to the effects?
25. Is the commitment of the plant to local community related to the effects?
26. Do you know RAMMAC (Reynosa Asociación de Maquiladoras y Manufactureras, A.C.)?
27. Do you know the RAMMAC supplier database or supplier development program?
28. Does your company join the RAMMAC supplier development program?
29. Does the plant join the RAMMAC supplier development program?
30. What are the problems with the RAMMAC supplier development program?  
How can the RAMMAC supplier development program advance?

31. Have you heard about Cluster? Has your company joined Cluster (e.g. automotive, aerospace, IT cluster etc)?
32. Does the plant join the same Cluster?
33. Is there any benefit to your company from joining the cluster?
34. What are the problems with the Cluster? How can the Cluster develop?
35. There has been a large amount of investment in the maquiladora industry. (a) What are opportunities and threats to local Mexican suppliers? (b) Do you think that the capabilities of local Mexican suppliers (including your company) have actually increased with the investment?
36. How can capabilities of local Mexican suppliers (including your company) increase?
37. Who should have an initiative role to develop capabilities of local Mexican suppliers? Government? Maquila plants? Educational institutes? or local Mexican suppliers themselves?
38. Are there any other important factors (e.g. border environment) for capability development of local Mexican suppliers?
39. Recession is the current economic situation. Does this economic situation affect the answers to the above questions? If yes, what are the effects?
40. What is the survival strategy of your company in the recession?

Thank You So Much



## Maquila plant

### I. Background information

1. Primary Industrial sector (highest percentage of sales) \_\_\_\_\_
2. Primary business (highest percentage of sales) \_\_\_\_\_
3. Year of establishment \_\_\_\_\_
4. Number of employees \_\_\_\_\_

### II. Interview questions

1. Which products or services does your plant purchase from local Mexican suppliers?
2. What is the percentage of purchase from local Mexican suppliers compared to other suppliers? Have the percentage changed? \* Approximate estimate is OK
3. Why does your plant transact with local Mexican suppliers?
4. What are strength and weakness of local Mexican suppliers?
5. To what extent do you evaluate capabilities of local Mexican suppliers?
6. Is there any assistance or interaction for capabilities of local Mexican suppliers from your plant?
7. What is the transaction type between your plant and local Mexican suppliers?

*(a) Our plant and local Mexican suppliers sell and purchase products or services by price in market. There is little interaction beyond transacting products or services for money.*

*(b) Local Mexican suppliers tend to take full responsibility for process technology and often use generic machinery that applies investments to wide customer base. Local Mexican suppliers satisfy with specific demands of our plant through codificative schemes in design and production. The cost of changing suppliers is low. There is little asset-specific investment that our plant and local Mexican suppliers can use just for each other.*

*(c) Our plant and local Mexican suppliers have a mutually dependent relationship based on trust. This mutually dependent relationship took a long time to be formed. The cost of changing suppliers or rebuilding trustworthy suppliers is high. There is relatively much asset-specific investment that our plant and local Mexican suppliers can use just for each other.*

*(d) Local Mexican suppliers depend on our plant. There is an unbalanced power relationship between our plant and local Mexican suppliers. Our plant monitors and controls the operations in local Mexican suppliers. The cost of changing suppliers is high. Local Mexican suppliers are specific by or to our plant.*

*(e) Our plant and local Mexican suppliers transact inside a single firm. Local Mexican suppliers are managerially controlled.*

8. Does this transactional characteristic affect the business of your plant?
9. Does this transactional characteristic affect capabilities of local Mexican suppliers?
10. What are the difficulties in transacting with local Mexican suppliers?
11. Many people comment the corruption in the transaction between maquiladora plants and local Mexican suppliers, especially in the relationship among maquiladora plants, local Mexican suppliers and distributors.
  - (a) What are the problems?
  - (b) How can the problems be solved?
12. To what extent does your plant commit to local community or contribute to the development of local community?
13. Does the commitment of your plant to local community affect the business of your plant?
14. Does the commitment of your plant to local community affect capabilities of local Mexican suppliers?
15. To what extent does your plant learn from local Mexican suppliers?
16. What does your plant learn from local Mexican suppliers?
17. To what extent is the absorptive capacity of local Mexican suppliers?

*\* Absorptive capacity is the ability to recognize the value of new information, assimilate it and apply it to commercial aims.*
18. How can local Mexican suppliers increase the absorptive capacity?

19. Are there entrepreneurial activities in the plant?

*\* Entrepreneurial activities in the plant are new products developed in the plant, enhancements to product lines in the plant and new corporate investments in R&D or manufacturing attracted by plant management*

20. Why are there entrepreneurial activities in the plant?

21. Are there any important factors (e.g. border environment) that affect entrepreneurial activities in the plant?

22. Do the entrepreneurial activities in the plant affect capabilities of local Mexican suppliers?

23. Is the transactional characteristic between your plant and local Mexican suppliers related to the effects?

24. Is the commitment of the plant to local community related to the effects?

25. Why did your plant join the RAMMAC supply development program?

26. Is your plant satisfied with the current supplier development program?

27. How can RAMMAC supplier development program develop?

28. Have you heard about Cluster? Has your plant joined to Cluster (e.g. automotive, aerospace, IT cluster etc)?

29. Do local Mexican suppliers join the same Cluster?

30. Is there any benefit to your plant from joining the cluster?

31. What are the problems with the Cluster? How can the Cluster develop?

32. There has been a large amount of investment in the maquiladora industry.

(a) What are opportunities and threats to local Mexican suppliers?

(b) Do you think that capabilities of local Mexican suppliers have actually increased with the investment?

33. How can capabilities of local Mexican suppliers increase?

34. Who should have an initiative role to develop capabilities of local Mexican suppliers?

Government? Maquila plants? Educational institutes? or local Mexican suppliers themselves?

35. Are there any other important factors (e.g. border environment) for capability development of local Mexican suppliers?

36. Recession is the current economic situation. Does this economic situation affect the answers to the above questions? If yes, what are the effects?

37. Is there any special sourcing strategy of your plant in the recession?

38. Many local Mexican suppliers may go bankrupt in the recession. How can local Mexican suppliers survive in the recession?

Thank You So Much

## Government

1. How do you evaluate the level of capabilities of local Mexican suppliers?
2. To what extent do you evaluate the absorptive capacity of local Mexican suppliers?  
  
*\* Absorptive capacity is the ability to recognize the value of new information, assimilate it and apply it to commercial aims.*
3. How can local Mexican suppliers increase their absorptive capacity?
4. Have you heard about Cluster? Has your organization joined Cluster (e.g. automotive, aerospace, IT cluster etc)?
5. What is the benefit of Cluster?
6. What are the problems with the Cluster? How can the Cluster develop?
7. There has been a large amount of investment in the maquiladora industry. Do you think that capabilities of local Mexican suppliers have actually increased with the investment?
8. How can capabilities of local Mexican suppliers increase?
9. Who should have an initiative role to develop capabilities of local Mexican suppliers? Government? Maquila plants? Educational institutes? or Local Mexican suppliers themselves?
10. Are there any other important factors (e.g. border environment) for capability development of local Mexican suppliers?
11. Recession is the current economic situation. Does this economic situation affect the answers to the above questions? If yes, what are the effects?

Thank You So Much

## Universities

1. How do you evaluate the level of capabilities of local Mexican suppliers?
2. To what extent do you evaluate the absorptive capacity of local Mexican suppliers?  
  
*\* Absorptive capacity is the ability to recognize the value of new information, assimilate it and apply it to commercial aims.*
3. How can local Mexican suppliers increase their absorptive capacity?
4. Have you heard about Cluster? Has your organization joined Cluster (e.g. automotive, aerospace, IT cluster etc)?
5. What is the benefit from joining the Cluster?
6. What are the problems with the Cluster? How can the Cluster develop?
7. There has been a large amount of investment in the maquiladora industry. What are opportunities and threats to local Mexican suppliers? Do you think that capabilities of local Mexican suppliers have actually increased with the investment?
8. How can capabilities of local Mexican suppliers increase?
9. Who should have an initiative role to develop capabilities of local Mexican suppliers? Government? Maquila plants? Educational institutes? or Local Mexican suppliers themselves?
10. Are there any other important factors (e.g. border environment) for capability development of local Mexican suppliers?
11. Recession is the current economic situation. Does this economic situation affect the answers to the above questions? If yes, what are the effects?  
  
(What is the effect of the recession for your company?)
12. Many local Mexican suppliers may go bankrupt in the recession. How can local Mexican suppliers survive in the recession?

Thank You So Much

## RAMMAC

1. How do you evaluate the level of capabilities of local Mexican suppliers?

*\* Capability of local Mexican suppliers means (1) technological capability (2) managerial capability (3) financial capability*

2. Absorptive capacity

(a) How do you evaluate the absorptive capacity of local Mexican suppliers?

*\* Absorptive capacity is the ability to recognize the value of new information, assimilate it and apply it to commercial aims*

*If a company has strong absorptive capacity, the company tries to learn new knowledge (e.g. new technology or new industry trend) more actively*

(b) How can local Mexican suppliers increase their absorptive capacity?

3. Entrepreneurial activity in maquila plant (\* Opinion from your interaction or observation)

(a) Do maquila plants do entrepreneurial activities?

*\* Entrepreneurial activities in the plant are (1) new products developed in the plant, (2) enhancements to product lines in the plant and (3) new corporate investments in R&D or manufacturing attracted by plant management*

(b) Why do maquila plants entrepreneurial activities?

(c) Do the entrepreneurial activities in the maquila plants affect capabilities of local Mexican suppliers?

(d) Is transactional characteristic between maquila plant and local Mexican suppliers related to the effect (c) ?

(e) Is the commitment of maquila plant to local community related to the effect (c)?

4. RAMMAC supplier development program

(a) What is the purpose (or motive)?

(b) What is the content?

(c) What are the problems (or difficulties)?

- (d) What is the plan?
5. What is the selection process of local suppliers in the RAMMAC supplier database?
  6. Cluster program
    - (a) What is the purpose (or motive)?
    - (b) Does RAMMAC join Cluster program (e.g. automotive, aerospace, IT cluster etc)?
    - (c) What is the benefit from joining the Cluster program?
    - (d) What are the problems (or difficulties) with the Cluster program?
    - (e) How can the Cluster program develop?
  7. There has been a large amount of investment in the maquiladora industry.
    - (a) What are opportunities and threats to local Mexican suppliers?
    - (b) Have capabilities of local Mexican suppliers actually increased with the investment?
  8. How can capabilities of local Mexican suppliers increase?
  9. Who should have an initiative role to develop capabilities of local Mexican suppliers? Government? Maquila plants? Educational institutes? or Local Mexican suppliers themselves?
  10. Are there any other important factors (e.g. border environment) for capability development of local Mexican suppliers?
  11. Many people comment violence issues in the border such as crime, drug, human rights infringement and government corruption.
    - (a) How do maquila plants deal with this violence issue? Do they implement any policy or programs?
    - (b) How do local Mexican suppliers deal with this violence issue? Do they implement any policy or programs?
  12. Many people comment the corruption in the transaction between maquiladora plants and local Mexican suppliers, especially in the relationship among maquiladora plants, local Mexican suppliers and distributors.
    - (a) What are the problems?



(b) How can the problems be solved?

13. Recession is the current economic situation. Does this economic situation affect the answers to the above questions? If yes, what are the effects?
14. Many local Mexican suppliers may go bankrupt in the recession. How can local Mexican suppliers survive in the recession?

Thank You So Much

## APPENDIX B

## APPENDIX B

### INFORMED CONSENT FORM (INTERVIEW) AND INTERVIEW QUESTIONS (SPANISH VERSION)

La Universidad de Tejas-Pan Americano  
Forma Informada del Consentimiento—Entrevista

Approved by  
UTPA IRB  
(Expires: N/A)

[Título del Estudio: **Espíritu Emprendedor en Corporaciones Multinacionales y El Desarrollo de La Capacidad de Firmas Locales: Un Estudio Exploratorio en La Región de La Frontera de Los Estados Unidos y México**]

Esta investigación se está conduciendo por [Jung-Hoon Lim] de la universidad de Tejas-Pan Americano/UTPA. Estamos conduciendo un estudio de la investigación alrededor [proceso del edificio de la capacidad de surtidores mexicanos locales]. Como parte de este estudio, estamos interesados en las ideas de [CEOs o los encargados en los surtidores y las maquiladoras mexicanas locales en (o acerque de) Reynosa, oficiales de maquila con relacion con el programa de desarrollo del surtidor de Reynosa en la Universidad, el gobierno del estado y RAMMAC (Reynosa Asociación de Maquiladoras y Manufactureras, el A.C.) del estado]

Le hemos invitado aquí hoy de modo que poder conducir una entrevista sobre las temas relacionadas con este asunto. La entrevista dura aproximadamente 30 a 60 minutos. Sus respuestas individuales serán tratadas confidencial. Su participación es totalmente voluntaria; aunque usted ha demostrado interés en participar en este estudio, usted está libre de retirarse de la entrevista en cualquier momento y puede elegir no contestar preguntas específicas.

Unas de las preguntas solicitan información sobre las actividades de la compañía para quien usted trabaja. Mientras que los datos publicados no se acoplamiento a sus respuestas sobre la compañía, realizamos que puede haber políticas de la compañía que restringen la información que le autorizan compartir. Siéntase por favor libre de no contestar algunas de las preguntas si usted siente que compartir la información sería una violación de cualquier política de la compañía.

Para asegurar la exactitud de declaraciones registradas, registraremos la sesión sobre la cinta audio y transcribiremos más adelante las cintas. Las cintas no serán marcadas con sus nombres y serán almacenadas con seguridad en UTPA. Las grabaciones serán utilizadas solamente para los propósitos de la investigación y no dadas a cualquier persona no implicada directamente en la investigación. Después de 3 años, las cintas serán destruidas o borradas.

Sus respuestas se pueden cotizar entera o parcialmente en las publicaciones o las presentaciones basadas en esta investigación. Si se utilizan las cotizaciones, su nombre verdadero será substituido por un nombre compuesto (seudónimo) y cualquier información adicional que pudiera identificarle directamente será excluida.

Usted debe ser por lo menos 18 años para participar en esta investigación. Si usted está no a cumplido esta edad, informe por favor al investigador antes de que la sesión comience.

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Approved by  
UTPA IRB  
(Expires: N/A)

Esta investigación ha sido repasado por el comité examinador institucional para la protección de los temas humanos (IRB). Si usted tiene cualesquiera preguntas sobre sus derechos como participante, o si usted se siente que se han violado sus derechos, por favor llame el IRB en el 956-384-5004

## Proveedores Locales Mexicanos

### I. Información antecedente

1. Sector Industrial principal (mayor porcentaje de ventas) \_\_\_\_\_
2. Producto principal (mayor porcentaje de ventas) \_\_\_\_\_  
Servicio principal (mayor porcentaje de ventas)
3. Año de establecimiento \_\_\_\_\_
4. Número de empleados \_\_\_\_\_

### II. Preguntas de entrevista

1. ¿Es mexicano el dueño de su compañía?
2. ¿Quién es su cliente? ¿Es alguna planta maquiladora su cliente?

*\*Si su compañía nunca proporciona servicio a las plantas maquiladoras conteste por favor enfocándose en el cliente con el que tiene el mayor porcentaje de ventas.*

3. ¿Quién es el competidor de la compañía?

*\*En la siguiente parte la planta se refiere a la planta maquiladora o si su compañía nunca ha proveído una maquiladora, se refiere a la planta del cliente con el porcentaje mayor en ventas.*

4. ¿Por qué la planta tramita con proveedores mexicanos locales?
5. Para la planta, cuál es el porcentaje de la compra de proveedores mexicanos locales comparado a otros proveedores foráneos? ¿ Ha cambiado el porcentaje? \* La estimación aproximada es suficiente.
6. ¿Cuáles son las fuerzas y debilidades de los proveedores mexicanos locales?
7. ¿Qué capacidades son necesarias para el producto o servicio de su compañía?
8. ¿Cómo obtiene su compañía esas capacidades?
9. ¿Existe alguna asistencia o interacción para estas capacidades por parte de la planta?
10. ¿Cuál es el tipo de transacción entre su compañía y la planta?

- (a) *Nuestra compañía y la planta compra y vende los productos o los servicios por precio adentro del mercado. Hay poca interacción aparte de tramitar productos o servicios por dinero.*
- (b) *Nuestra compañía toma la responsabilidad completa de la tecnología de proceso y utiliza la maquinaria genérica que aplica inversiones a la base de los clientes. Nuestra compañía satisface las demandas específicas de la planta con un Codificarte de esquemas en diseño y producción. El costo de cambiar proveedores es bajo. Hay poca inversión activo-específica para la cual nuestra compañía y la planta pueden utilizar.*
- (c) *Nuestra compañía y la planta tienen una relación mutuamente dependiente de confianza. Esta relación mutuamente dependiente tomó tiempo para formarse. El costo de cambiar proveedores o de encontrar a proveedores dignos de confianza es alto. Hay relativamente mucha inversión activo-específica que nuestra compañía y la planta pueden utilizar.*
- (d) *Nuestra compañía depende de la planta. Hay una relación desequilibrada entre nuestra compañía y la planta. La planta supervisa y controla las operaciones en nuestra compañía. El costo de cambiar proveedores es alto. Nuestra compañía es específica para la planta.*
- (e) *Nuestra compañía y la planta tramitan dentro de una sola firma. Nuestra compañía es controlada por un directivo.*

11. Afecta esta característica transaccional las capacidades directivas, tecnológicas y financieras de su compañía?
12. ¿Cuáles son las dificultades en tramitar con la planta?
13. Muchas personas observan la corrupción en las transacciones entre las plantas maquiladoras y los proveedores mexicanos locales, sobre todo para la relación entre las plantas maquiladoras, proveedores mexicanos locales y los distribuidores. ¿Cuáles son los problemas? ¿Cómo pueden los problemas que resolver?
14. En qué medida la planta se compromete con la comunidad local o contribuya a desarrollo de la comunidad local?
15. ¿Afecta este compromiso de la planta a la comunidad local con las capacidades de su compañía?
16. ¿En qué medida aprende su compañía de la planta?
17. ¿Qué tanto aprende su compañía de la planta?
18. ¿En qué medida es la capacidad de absorción de su compañía?

*\* La capacidad de absorción es la capacidad de reconocer el valor de la nueva información, asimilar y aplicar a los objetivos comerciales.*

19. ¿Cómo puede su compañía aumentar la capacidad de absorción?

20. ¿Hay actividades emprendedoras en la planta?

*\* Las actividades emprendedoras en la planta son productos nuevos desarrollados en la planta, realces a las líneas de productos en la planta y a las nuevas inversiones corporativas en el R&D o fabricación atraída por la dirección de una fábrica.*

21. ¿Por qué hay actividades emprendedoras en la planta?

22. Hay algún factor importante (e.g. medio ambiente fronterizo) que afecte las actividades emprendedoras en la planta?

23. ¿Afectan las actividades emprendedoras en la planta las capacidades de su compañía?

24. ¿Esta relacionada la característica transaccional entre su compañía y la planta a los efectos?

25. ¿El compromiso de la planta con la comunidad local se relaciona con los efectos?

26. ¿Sabes RAMMAC(Reynosa Asociación de Maquiladoras y Manufactureras, A.C.)?

27. ¿Sabes programa de desarrollo de proveedores de RAMMAC?

28. ¿Su compañía ensambla el mismo programa de desarrollo de proveedores de RAMMAC ?

29. ¿La planta ensambla el mismo programa de desarrollo de proveedores de RAMMAC ?

30. ¿Cuáles son los problemas con el programa de desarrollo del proveedor de RAMMAC? ¿Cómo puede el programa de desarrollo del proveedor de RAMMAC convertirse?

31. ¿Usted ha oído de Cluster? En su compañía ensamblan el Cluster (e.g. automotor, aeroespacial, IT Cluster, etc.)?

32. ¿La planta ensambla el mismo Cluster?

33. ¿Hay ventaja por parte de su compañía de ensamblar el Cluster?

34. ¿Cuáles son los problemas con el Cluster? ¿Cómo puede el Cluster convertirse?

35. Ha habido una inversión grande en la industria maquiladora. ¿Cuáles son las oportunidades y las amenazas para los proveedores mexicanos locales? Usted piensa que las capacidades de proveedores mexicanos locales han aumentado realmente con la inversión (incluyendo su compañía)?
36. Cómo pueden las capacidades de proveedores mexicanos locales (su compañía incluida) aumentar?
37. Quién debe tener el principal papel de iniciativa para desarrollar capacidades de los proveedores locales mexicanos? ¿Gobierno, plantas de maquila, institutos educativos, o proveedores mexicanos locales?
38. Hay algún otro factor importante (e.g. medio ambiente fronterizo) para el desarrollo de la capacidad de proveedores mexicanos locales?
39. La recesión es la situación económica del presente. Esta situación económica ha afectado sus respuestas a las preguntas antedichas? ¿Si sí, cuáles son los efectos?
40. ¿Hay alguna estrategia de supervivencia de su compañía en la recesión?

¡Muchas Gracias!



## Planta Maquila

### I. Información antecedente

1. Sector Industrial principal (mayor porcentaje de ventas) \_\_\_\_\_
2. Negocio principal (mayor porcentaje de ventas) \_\_\_\_\_
3. Año de establecimiento \_\_\_\_\_
4. Número de empleados \_\_\_\_\_

### II. Preguntas de la entrevista

1. ¿Qué productos o servicios su planta compra a los proveedores locales mexicanos?
2. Para la planta, sabe cuál es el porcentaje de la compra de proveedores mexicanos locales comparado a otros surtidores foráneos? ¿ Ha cambiado el porcentaje? \* La estimación aproximada es suficiente.
3. ¿Por qué la planta tramita con los proveedores mexicanos locales?
4. ¿Cuáles son las fuerzas y debilidades de proveedores mexicanos locales?
5. En qué medida usted evaluaría la capacidad directiva, tecnológica y financiera de proveedores mexicanos locales?
6. Hay alguna ayuda o interacción para las capacidades directivas, tecnológicas y financieras de proveedores mexicanos locales por parte de su planta?
7. ¿Cuál es el tipo de la transacción entre su planta y los proveedores Mexicanos locales?
  - (a) *Nuestra planta y los proveedores Mexicanos locales compramos y vendemos los productos o los servicios por precio adentro mercado. Hay poca interacción aparte de tramitar productos o servicios por dinero.*
  - (b) *Los proveedores Mexicanos locales toman la responsabilidad completa de la tecnología de proceso y utilizan la maquinaria genérica que aplica inversiones a la base de los clientes. Los proveedores Mexicanos locales satisfacen las demandas específicas de la planta con codificante de esquemas en diseño y producción. El costo de cambiar proveedores es bajo. Hay poca inversión activo-específica para la cual Nuestra planta y los proveedores Mexicanos locales pueden utilizar.*

(c) *Nuestra planta y los surtidores Mexicanos locales tienen una relación mutuamente dependiente de confianza. Esta relación mutuamente dependiente tomó tiempo para formarse. El costo de cambiar surtidores o de encontrar a surtidores dignos de confianza es alto. Hay relativamente mucha inversión activo-específica que Nuestra planta y los surtidores Mexicanos locales pueden utilizar.*

(d) *Los surtidores Mexicanos locales depende de Nuestra planta. Hay una relación desequilibrada entre Nuestra planta y los proveedores Mexicanos locales. Nuestra planta supervisa y controla las operaciones en Los surtidores Mexicanos locales. El costo de cambiar proveedores es alto. Los proveedores Mexicanos locales son Específicos para la planta.*

(e) *Nuestra planta y los proveedores Mexicanos locales tramitan dentro de una sola firma. Los proveedores Mexicanos locales son controlados por un directivo.*

8. ¿Afecta esta característica transaccional el negocio de su planta?
9. ¿Esta característica transaccional afectan las capacidades de proveedores mexicanos locales?
10. ¿Cuáles son las dificultades en tramitar con los proveedores mexicanos locales?
11. Muchas personas observan la corrupción en las transacciones entre las plantas maquiladoras y los proveedores mexicanos locales, sobre todo para la relación entre las plantas maquiladoras, proveedores mexicanos locales y los distribuidores. ¿Cuáles son los problemas? ¿Cómo pueden los problemas que resolver?
12. ¿En qué medida su planta se compromete con la comunidad local o contribuya al desarrollo de la comunidad local?
13. El compromiso de su planta con la comunidad local afecta el negocio de su planta?
14. El compromiso de su planta con la comunidad local afectan las capacidades de proveedores mexicanos locales?
15. ¿En qué medida aprende su planta de los proveedores mexicanos locales?
16. ¿Qué aprende su planta de los proveedores mexicanos locales?
17. ¿En qué medida es la capacidad de absorción de proveedores mexicanos locales?

\* *La capacidad de absorción es la capacidad de reconocer el valor de la nueva información, lo asimila y aplica a los objetivos comerciales.*

18. ¿Cómo pueden los proveedores mexicanos locales aumentar la capacidad de absorción?
19. ¿Hay actividades emprendedoras en la planta?  
  
*\* Las actividades emprendedoras en la planta son productos nuevos desarrollados en la planta, realces a las líneas de productos en la planta y a las nuevas inversiones corporativas en el R&D o fabricación atraída por la dirección de una fábrica.*
20. ¿Por qué hay esas actividades emprendedoras en la planta?
21. Hay algún factor importante (e.g. medio ambiente fronterizo) que afecte las actividades emprendedoras en la planta?
22. Afectan las actividades emprendedoras en la planta las capacidades de los proveedores locales mexicanos?
23. Esta relacionada la característica transaccional entre su planta y los proveedores locales mexicanos a los efectos?
24. El compromiso de la planta con la comunidad local se relaciona con los efectos?
25. ¿Por qué su planta se unió al programa de desarrollo de la proveedores de RAMMAC?
26. ¿ Está su planta satisfecha con el programa de desarrollo actual del proveedor?
27. ¿Cómo puede el programa de desarrollo del proveedor de RAMMAC convertirse?
28. ¿Usted ha oído de Cluster? su planta ensamblan el Cluster (e.g. automotor, aeroespacial, IT Cluster, etc.)?
29. ¿Ensamblan el mismo Cluster los proveedores mexicanos locales?
30. ¿Hay ventaja por parte de su planta de ensamblar el Cluster?
31. ¿Cuáles son los problemas con el Cluster? ¿Cómo puede el Cluster convertirse?
32. Ha habido una inversión grande en la industria maquiladora. ¿Cuáles son las oportunidades y las amenazas para los proveedores mexicanos locales? Usted piensa que las capacidades de proveedores mexicanos locales han aumentado realmente con la inversión?
33. ¿Cómo pueden las capacidades de proveedores mexicanos locales aumentar?

34. Quién debe tener un principal papel en la iniciativa para desarrollar capacidades para los proveedores locales mexicanos? ¿Gobierno, plantas de maquila, institutos educativos, o proveedores mexicanos locales?
35. Hay algún otro factor importante (e.g. medio ambiente fronterizo) para el desarrollo de la capacidad de proveedores mexicanos locales?
36. La recesión es la situación económica del presente. Ha esta situación económica afectado sus respuestas a las preguntas antedichas? ¿Si sí, cuáles son los efectos?
37. Hay alguna estrategia de abastecimiento especial en la recesión?
38. Muchos de los proveedores mexicanos locales puede ser la quiebra en la recesión. ¿Cómo pueden los proveedores mexicanos locales sobrevivir en la recesión?

¡Muchas Gracias!

## Gobierno

1. ¿Cómo evaluaría usted el nivel de la capacidad de los proveedores mexicanos locales?
2. ¿En qué medida usted evaluaría la capacidad de absorción de proveedores mexicanos locales?  
  
*\* La capacidad de absorción es la capacidad de reconocer el valor de la nueva información asimilarla y aplicarla a los objetivos comerciales.*
3. ¿Cómo pueden los proveedores mexicanos locales aumentar su capacidad de absorción?
4. ¿Usted ha oído hablar del Cluster? ¿En su organización ensamblan el Cluster (e.g. automotor, aeroespacial, etc.)?
5. ¿Cuál es la ventaja de ensamblar el Cluster?
6. ¿Cuáles son los problemas con el Cluster? ¿Cómo puede el Cluster convertirse?
7. Ha habido una inversión grande en la industria del maquiladora. ¿Cuáles son las oportunidades y las amenazas para los proveedores mexicanos locales? ¿Usted piensa que las capacidades de los proveedores mexicanos locales han aumentado realmente con la inversión?
8. ¿Cómo pueden las capacidades de los proveedores mexicanos locales aumentar?
9. ¿Quién debe tener un papel de la iniciativa para desarrollar las capacidades de los proveedores locales mexicanos? ¿Gobierno, plantas de maquila, institutos educativos, o proveedores mexicanos locales?
10. ¿Hay algún otro factor importante (e.g. medio ambiente fronterizo) para la capacidad de desarrollo de proveedores mexicanos locales?
11. La recesión es la situación económica del presente. ¿Ha esta situación económica afectado sus respuestas a las preguntas antedichas? ¿Si sí, cuáles son los efectos? ¿Cuál es el efecto de la recesión para su universidad?

¡Muchas Gracias!

## Universidades

1. ¿Cómo evaluaría usted el nivel de la capacidad de los proveedores mexicanos locales?
2. ¿En qué medida usted evaluaría la capacidad de absorción de proveedores mexicanos locales?  
  
*\* La capacidad de absorción es la capacidad de reconocer el valor de la nueva información asimilarla y aplicarla a los objetivos comerciales.*
3. ¿Cómo pueden los proveedores mexicanos locales aumentar su capacidad de absorción?
4. ¿Usted ha oído hablar del Cluster? ¿En su organización ensamblan el Cluster (e.g. automotor, aeroespacial, etc.)?
5. ¿Cuál es la ventaja de ensamblar el Cluster?
6. ¿Cuáles son los problemas con el Cluster? Cómo puede el Cluster convertirse?
7. Ha habido una inversión grande en la industria del maquiladora. ¿Cuáles son las oportunidades y las amenazas para los proveedores mexicanos locales? Usted piensa que las capacidades de los proveedores mexicanos locales han aumentado realmente con la inversión?
8. ¿Cómo pueden las capacidades de los proveedores mexicanos locales aumentar?
9. Quién debe tener un papel de la iniciativa para desarrollar las capacidades del los proveedores locales mexicanos? ¿Gobierno, plantas de maquila, institutos educativos, o proveedores mexicanos locales?
10. Hay algún otro factor importante (e.g. medio ambiente fronterizo) para la capacidad de desarrollo de proveedores mexicanos locales?
11. La recesión es la situación económica del presente. ¿Ha esta situación económica afectado sus respuestas a las preguntas antedichas? ¿Si sí, cuáles son los efectos? ¿Cuál es el efecto de la recesión para su universidad?
12. Muchos de los proveedores mexicanos locales puede ser la quiebra en la recesión. ¿Cómo pueden los proveedores mexicanos locales sobreviven en la recesión?

¡Muchas Gracias!

## RAMMAC

1. ¿Cómo evalúa el nivel de capacidades de los proveedores locales mexicanos?

*\* Capacidad de los proveedores locales mexicanos se refiere a (1) la capacidad tecnológica (2) capacidad de gestión (3) capacidad financiera*

2. La capacidad de absorción

(a) ¿Cómo evalúa la capacidad de absorción de los proveedores locales mexicanos?

*La capacidad de absorción es la capacidad de reconocer el valor de la nueva información, asimilar y aplicar a los objetivos comerciales.*

*Si una empresa tiene la capacidad de absorción fuerte, la empresa trata de aprender nueva conocimiento (por ejemplo, nueva tecnología o tendencia de la nueva industria) de manera más activa*

(b) ¿Cómo pueden los proveedores locales mexicanos aumentar su capacidad de absorción?

3. La actividad emprendedora en la planta de maquila (\*Opinion de su interacción u observación)

(a) ¿Las plantas maquiladoras realizar actividades empresariales?

*\* Las actividades emprendedoras en la planta son productos nuevos desarrollados en la planta, realces a las líneas de productos en la planta y a las nuevas inversiones corporativas en el R&D o fabricación atraída por la dirección de una fábrica.*

(b) ¿Por qué las plantas maquiladoras emprenden actividades?

(c) ¿Las actividades empresariales en las plantas maquiladoras afectan a las capacidades de los proveedores locales mexicanos?

(d) ¿Esta relacionada la característica transaccional entre la planta maquiladora y los proveedores locales mexicanos con el efectos (c)?

(e) ¿El compromiso de la planta maquiladora con la comunidad local se relaciona con los efectos (c) ?

4. Programa de desarrollo de proveedores de RAMMAC

(a) ¿Cuál es el propósito (o motivo)?

(b) ¿Cuál es el contenido?

- (c) ¿Cuáles son los problemas (o dificultades)?
  - (d) ¿Cuál es el plan?
5. ¿Cuál es el proceso de selección de proveedores locales en la base de datos de proveedores RAMMAC?
6. Programa de Cluster
- (a) ¿Cuál es el propósito (o motivo)?
  - (b) ¿RAMMAC se une al programa de Cluster (por ejemplo, automotriz, aeroespacial, tecnología informática cluster, etc)?
  - (c) ¿Cuál es el beneficio de participar en el programa Cluster?
  - (d) ¿Cuáles son los problemas (o dificultades ) con el programa de Cluster?
  - (e) ¿Cómo puede el programa de Cluster desarrollarse?
7. Ha habido una gran cantidad de inversión en la industria maquiladora.
- (a) ¿Cuáles son las oportunidades y las amenazas a los proveedores locales mexicanos?
  - (b) Tener capacidad de los proveedores locales de México aumentó con la inversión?
8. ¿Cómo se puede aumentar la capacidad de los proveedores locales de México?
9. ¿Quién debe tener un papel de la iniciativa para desarrollar las capacidades del los proveedores locales mexicanos? ¿Gobierno, plantas de maquila, institutos educativos, o proveedores mexicanos locales?
10. Hay algún otro factor importante (e.g. medio ambiente fronterizo) para la capacidad de desarrollo de proveedores mexicanos locales?
11. Mucha gente comenta asuntos de violencia en la frontera, como la delincuencia, las drogas, infracción de derechos humanos y la corrupción gubernamental.
- (a) ¿Cómo las plantas maquiladoras tratan este tema de la violencia? ¿Implementan alguna política o programa?
  - (b) ¿Cómo tratan los proveedores mexicanos locales con este tema de la violencia? ¿Implementan alguna política o programa?
12. Muchas personas observan la corrupción en las transacciones entre las plantas maquiladoras y los proveedores mexicanos locales, sobre todo para la relación entre las plantas maquiladoras, proveedores mexicanos locales y los distribuidores. ¿Cuáles son los problemas? ¿Cómo pueden los problemas que resolver?
13. La recesión es la situación económica del presente. . Ha esta situación económica afectado sus respuestas a las preguntas antedichas? ¿Si sí, cuáles son los efectos?



14. Muchos de los proveedores mexicanos locales puede ser la quiebra en la recesión.  
¿Cómo pueden los proveedores mexicanos locales sobreviven en la recesión?

¡Muchas Gracias!

## BIOGRAPHICAL SKETCH

Jung-Hoon Lim was born in Jeju Island in Korea (ROK). He received his Ph.D. in Business Administration (Subject: Management with an emphasis in International Business) from The University of Texas-Pan American (December, 2010).

Before that, he received his Master of Science (Master of Science in Management and Administrative Sciences, Concentration in Organization and Strategy) from The University of Texas at Dallas (May, 2004). He also received his Bachelor of Business Administration (August, 1996) and his Master of Business Administration (February, 1999) from Yonsei University located in Korea (ROK).

He taught a few management courses as an assistant instructor in the Department of Management at The University of Texas-Pan American from Fall 2009 to Spring 2010. He also worked as a research assistant in the College of Business at The University Texas-Pan American from Fall 2004 to Fall 2008.