

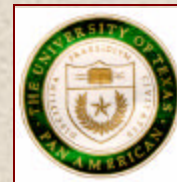
The Drivers of Evolution/Upgrading in Mexico's Maquiladoras: How Important is Subsidiary Initiative?



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Abstract: Corporate entrepreneurship may play an important role as a driver of industrial upgrading in multinational subsidiaries. In this study we test to determine if subsidiary initiative – defined as a discrete, proactive undertaking that advances a new way for the corporation to use or expand its resources – is related to industrial upgrading in a sample of 55 maquiladoras in the Mexican cities of Reynosa and Guadalajara. Based on qualitative and quantitative information collected from plant managers, this study provides qualified support for the notion that increased responsibilities within MNC networks are something earned through the entrepreneurial efforts of subsidiary managers rather than given by the parent company.

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Economic theory proposes foreign direct investment (FDI) can make a positive contribution to host country economies by supplying capital, technology, and management resources that would otherwise not be available. However, some forms of FDI are clearly better than others. For example, consider a multinational company (MNC) that establishes a maquiladora plant along the US-Mexico border. Given the local workforce is likely to be young, semi-skilled, and prone to high rates of turnover, the parent company may initially transfer only simple assembly processes to the border plant. From the perspective of the host country, this type of FDI results in job creation but little else. Fortunately, the role initially assigned to the Mexican plant by the MNC is not necessarily the role it will retain over time. Ideally, as the local workforce gains experience the parent will begin to transfer to the maquila more complex products. To support the new product lines, the maquila may provide more training to its employees, bring in additional machinery, and hire a greater proportion of knowledge workers in areas such as quality engineering and production planning. As this upgrading process continues, over time the low-tech assembly maquila may evolve into a fully functional, technology intensive, world class manufacturing facility.

Surprisingly, we know relatively little about the forces within MNCs that trigger this type of evolutionary process. This deficiency makes it difficult for host country governments, international development agencies, and even MNCs themselves to develop policies to foster subsidiary evolution/upgrading. For these groups, an important and largely unanswered question is the role played by local management teams in the upgrading process. In what is referred to as the “head office assignment” perspective (Birkinshaw & Hood, 1998), local managers are assumed to do little more than carry out directives issued by the parent company. As long as they are reasonably competent,

subsidiary managers may not be an important force either inhibiting or facilitating the evolutionary process.

Research is beginning to challenge this perspective of what causes evolution/upgrading to occur. In a series of studies, Birkinshaw (1996, 1997) examined how subsidiaries of US MNCs in Canada were able to gain increased charter responsibilities. A subsidiary's charter is defined as the business - or elements of the business - in which the subsidiary participates and for which it is recognized to have responsibility within the MNC. Birkinshaw (1996) found considerable evidence suggesting increased responsibilities within MNC networks are something earned through the entrepreneurial efforts of subsidiary management rather than given by the parent company. Subsidiary managers obtain new charters through exercising initiative (defined as a discrete, proactive undertaking that advances a new way for the corporation to use or expand its resources). Based on these findings, Birkinshaw (1997) proposes corporate entrepreneurship at the subsidiary level may represent the primary driver of the subsidiary evolution/upgrading process. In the study detailed in this paper, we determine if Birkinshaw's findings generalize to the Latin American and maquiladora context.

Our interest in subsidiary initiative is the result of several conversations with the retired plant manager of a very large, Japanese owned maquiladora. A strong believer that maquilas should operate as complete businesses rather than simple factories, when hired as plant manager one of his primary goals was to create a design center on the border. However, within the MNC the design function was performed in both Japan and the US. Neither of these branches of the MNC were willing to delegate design responsibilities to the Mexican subsidiary. Undeterred by the lack of a formal charter, the plant manager convinced the parent company to allow him to add a small number of highly paid engineers to the local staff. He then sent this group to Japan to learn everything they could from the parent's

engineering teams. When they returned to Mexico, these individuals formed the beginnings of the maquila's design center. From that point forward, whenever top managers from Japan came to Tijuana there would be signs at appropriate locations in the plant explaining how local engineers had modified a product or process and how much money these changes saved the company. Having demonstrated their importance in terms the parent company understood, the plant manager inevitably lobbied his visitors for budget authority to hire an additional one or two engineers. After ten years as plant manager, the once clandestine design group had expanded to 60 plus people and Tijuana had earned a formal design charter within the MNC network. Our study is designed to determine if this type of local initiative represents an exceptional case or the standard way maquiladoras obtain new charter responsibilities.

This paper is divided into four sections. The first presents relevant findings from the subsidiary management literature as well as a brief discussion of the maquiladoras. The second section details the quantitative and qualitative methodologies used to address our research questions. The third section presents our findings while section four discusses the implications of this study for both theory and practice.

1. The network model of MNCs and subsidiary evolution

Early models of the internal workings of MNCs often assumed top managers in the home country utilize a top down, command and control approach to direct the strategic and tactical decisions made at the subsidiary level. More recent research, however, tends to portray subsidiaries as semi-autonomous entities connected to the parent company and other branches of the MNC through a dense

network of personal and bureaucratic linkages (cf. Ghoshal & Bartlett, 1990). With the branches of the MNC clearly capable of taking on an identity somewhat independent of the parent, studies of MNC subsidiaries have become increasingly popular (cf. Birkinshaw, 2001; Paterson & Brock, 2002). Researchers have examined such topics as the creation, adoption, and diffusion of innovations by subsidiaries (Ghoshal & Bartlett, 1988), the roles subsidiaries take on within MNC networks (such as receptive, active, and autonomous subsidiaries) (Jarillo & Martínez, 1990), and even the relocation of divisional headquarters from home to host countries (Forsgren, Holm, & Johanson, 1995). Until recently, however, there has been little attention paid to corporate entrepreneurship at the subsidiary level and especially who or what is responsible for subsidiary evolution.

Directly addressing this gap, Birkinshaw (1997) argues that in order to increase efficiency and competitive pressures within large, complex, often bureaucratic global organizations, MNCs frequently resort to establishing formal or informal internal market systems. For example, the parent company R&D operation may develop a new product. Rather than simply assigning the new item to a specific manufacturing plant, the parent will set up a competitive bidding process. The MNC's subsidiaries and potentially even external contract manufacturers will then compete for the opportunity to manufacture the new product. In addition to price, Birkinshaw and Hood (1998) state the track record of the subsidiary and the credibility of local management are key criteria considered by the parent in the bidding process. To successfully compete in the MNC network, subsidiary managers must proactively seek out and develop new business opportunities as well as engage in a long and often slow process of capability building.

A number of studies serve to better define the challenges faced by managers in internal market systems. For example, existing charters may be contested by others and subsidiaries can both gain and

lose charter responsibilities (Birkinshaw, 1996). Furthermore, ethnocentric parent company managers may assign charters based on criteria unrelated to profit maximization. Birkinshaw and Ridderstrale (1999) find parent company managers often view subsidiary initiatives suspiciously; i.e. as unsanctioned efforts by subsidiary managers acting in their own or their country's interests rather than in the interests of the MNC as a whole. Viewed as an alien body by the corporate immune system, initiatives often encounter resistance in the form of bureaucratic inertia, strict funding criteria for new projects, and even open hostility from managers at competing subsidiaries. Birkinshaw et al. (2000) contend subsidiary managers commonly overestimate the strategic importance of their subsidiary within the broader MNC. Based on a sample of Swedish owned subsidiaries, they found parent company managers respond to these perception gaps by reasserting control.

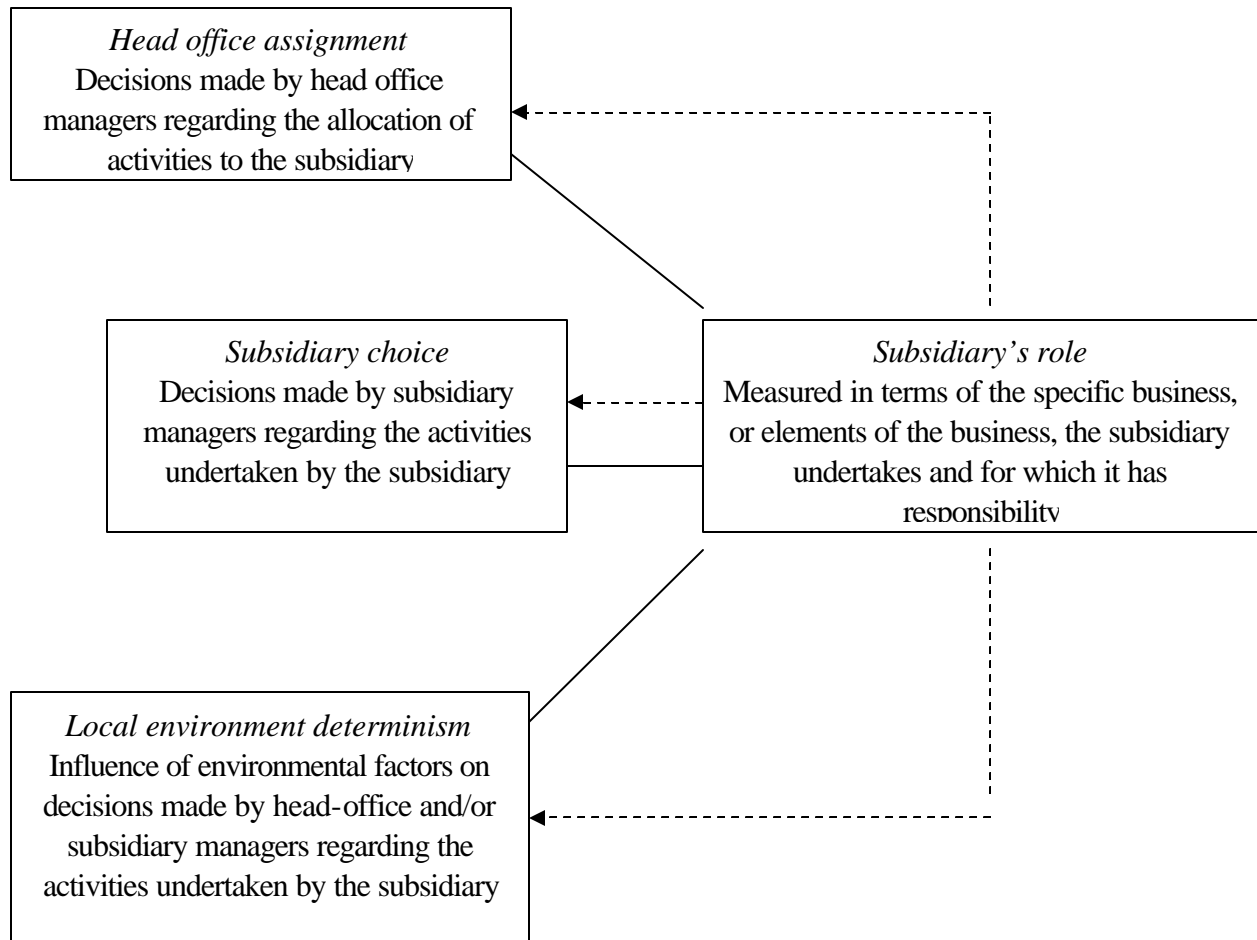
The majority of studies examining initiative are based on MNC subsidiaries located in relatively small industrialized countries (Canada, Sweden, and the United Kingdom). Birkinshaw (1996, 1997) cautions results from these countries may not generalize to subsidiaries in large developed countries or those located in less developed regions. Furthermore, Birkinshaw (2001: p. 388) himself questions whether this model of how charters are assigned is valid. He writes “(I) attempted to frame the MNC as an internal market system in which subsidiary companies compete with one another for charters, but it is not yet clear if this approach will yield any valuable insights.” Another issue of concern is subsidiary initiative may be a relatively rare phenomena. Ghoshal and Bartlett (1988; p. 370) found even in industrialized countries many subsidiaries “possess neither the competence nor the legitimacy to initiate new programs” and Birkinshaw et al. (1998; p. 235) report “initiative is absent in a large percentage of subsidiaries.”

These findings suggest in many cases the traditional explanations for what causes subsidiary to develop may represent much stronger predictors of subsidiary evolution/upgrading than subsidiary initiative. The three competing paradigms are shown in Figure One. Briefly summarized, the head office assignment perspective proposes parent company managers are the primary force driving subsidiary evolution. To decide where new products will be made, for example, the parent may simply conduct a detail cost accounting analysis of alternative production locations and then assign the new charter to the lowest cost manufacturing site. The local environmental determinism perspective emphasizes the importance of the dynamism and attractiveness of the local business context and the incentive programs offered by the host government as the primary factors influencing the subsidiary development process. Much of the scholarship on clusters and industrial districts can be interpreted as supporting the local environmental determinism perspective of subsidiary evolution.

Mexico's maquiladoras present a fascinating context in which to test the competing models of subsidiary evolution. Maquilas are an important part of what is commonly referred to as the global export processing zone (EPZ) industry (cf. Grunwald & Flamm, 1985; Sklair, 1993; ILO, 1998). With this production model, components are imported duty free, undergo an assembly or manufacturing process utilizing the host country's low cost labor force, and are then exported back to the industrialized world. The international product life cycle (Vernon, 1966) provides a concise description of the types of industrial activities traditionally performed in EPZs. Vernon (1966) found newly introduced, innovative products are typically manufactured in industrialized countries. Only when an item transitions from an innovative to a standardized product and manufacturers begin to experience intense cost pressure will production be shifted to low wage EPZs. In addition, MNCs traditionally retain

knowledge intensive activities, such as product design, purchasing, and customer service, in industrialized countries and delegate a narrow range of manufacturing tasks to their EPZ plants.

Figure One: Drivers of Subsidiary Evolution



Source: Birkinshaw & Hood (1998)

Critics frequently argue the structure of the EPZ industry prevents participating firms from evolving towards higher value added activities (Fernández-Kelly, 1983). Countering these arguments, studies of how maquiladoras have changed over the last two decades provides some evidence the EPZ production model may not be as restrictive as once thought. For example, as early as the late 1980s

researchers began documenting maquiladoras utilizing advanced manufacturing technology, just-in-time inventory systems, and total quality management techniques (cf. Shaiken, 1990; Wilson, 1992, Carrillo & Hualde, 1998). More recent studies find Mexican EPZ firms are forming highly productive industrial clusters (Carrillo & Hualde, 2002) and gaining “full package” production responsibilities (Bair & Gereffi, 2001).

To the best of our knowledge, this is the first study examining subsidiary initiative in EPZ firms. Therefore, our first objective is to determine if initiative is a meaningful construct in this context.

Formally stated;

Research Question One: Is subsidiary initiative an important driver of subsidiary evolution/upgrading in maquiladoras?

As discussed, host country governments are very interested in understanding the factors leading to the development of higher quality FDI. If the answer to the first research question is yes, the next logical question becomes which of the drivers results in more rapid subsidiary development. Since our research methodology does not allow us to explore local environmental determinism explanations for upgrading, we compare and contrast the remaining two drivers. This leads to our second research question:

Research Question Two: Which of the drivers of subsidiary evolution (head office assignment or subsidiary choice) is more strongly associated with evolution/upgrading in maquiladoras?

In keeping with the theme of this special issue, an additional factor makes this study especially relevant. Over the 2000 to 2003 period, the maquiladora industry experienced its first major contraction. Job losses over this four year period total almost 300,000 (INEGI, 2004). Studies find the ongoing maquila crisis is the result of the 2001 US recession, a strong Mexican peso, higher

Mexican taxes, the implementation of NAFTA Article 303, and changes in international trade agreements granting easier access to US markets to producers in lower costs EPZs in China and Central America (e.g. Sargent & Matthews, 2003). With maquiladoras facing higher costs and increased international competition, our study provides new insight into the role of corporate entrepreneurship in Latin America as a tool to enhance regional competitiveness.

In the next section, we present the research methodology utilized to determine the importance of subsidiary initiative in Mexico's maquiladoras. Given the incipient nature of subsidiary evolution studies, we take an exploratory approach and our evidence is based primarily on qualitative information collected from interviews with maquiladora plant managers.

2. Research methodology

As part of a larger study examining maquiladora competitiveness, we conducted plant visits and in-depth semi-structured interviews with top managers at 50 plants in Reynosa and 5 plants in Guadalajara (sample firms in these two cities employed 46,749 and 20,335 people respectively). Given the limited number of Guadalajara interviews, we save our findings comparing subsidiary evolution in the two locations for the discussion section. Located on the US-Mexican border across from McAllen, Texas, as of December, 2003 Reynosa (73,131) ranked behind only Cd. Juárez (196,979) and Tijuana (141,659) as the Mexican city with the largest number of maquila employees (INEGI, 2004). With the exception of apparel, Reynosa firms are well diversified in the major maquila segments and are controlled by a mixture of both large and small MNCs from the US, Europe, and Asia. Utilizing a directory provided by a local economic development agency, we contacted maquilas located in the six major industrial parks in Reynosa that had started operations in 2001 or earlier and employed 125 or

more people. Managers at 50 of the 75 firms that fit our sampling criteria agreed to participate. Interviews were conducted from July to November, 2002 and from August to September, 2003. In addition, in 1998 and again in 1999-2000 we conducted two prior rounds of data collection in Reynosa. Especially for a study examining subsidiary evolution, the familiarity resulting from interviewing plant managers and touring production facilities multiple times over a five year period enable us to have a greater level of confidence in our results than would otherwise be possible.

The question of whether the parent company or local managers were responsible for subsidiary upgrading/evolution was not particularly relevant for several of our sample firms. Three plants were in the process of either shutting down, changing owners, or about to be sold. In another maquila a new plant manager did not feel he had sufficient information to respond to many of our questions. Even though they had been operating for roughly a year, managers at two plants stated they were still very much in the start-up phase. The managerial challenges facing individuals in these plants were very different compared to more established maquilas. Two plant managers stated changes in their operation were being driven by customer demands and as a result the preferences of local and parent company managers were not particularly relevant. Finally, based on our measures three plants were not experiencing evolution/upgrading of any kind. The characteristics of the 40 maquilas making up our final Reynosa sample are given in Table One.

Table One: *Sample Characteristics*

	<u>Industry Sector</u>			<u>Parent Nationality</u>			<u>Grand Total</u>
	<u>Electronic</u>	<u>Auto</u>	<u>Other</u>	<u>US</u>	<u>Asia</u>	<u>Europe</u>	
Number of firms	18	7	15	33	2	5	40
Total employment	18,313	17,038	7,400	34,732	2,166	5,853	42,751

Based on an extensive review of relevant literatures, the interview guide used as part of our semi-structured interviews included a variety of questions addressing industrial upgrading and subsidiary evolution adapted to the maquiladora context. Utilizing a five point Likert scale (one indicating no trend, three a moderate trend, and five a strong trend), interviewees stated whether or not they were assembling or manufacturing more complex products, utilizing more capital intensive equipment, employing additional engineers, and performing additional value added functions (dealing directly with customers, other marketing activities, full control over purchasing, supplier development, or other value added activities). Next, and again using a five point Likert scale interviewees stated whether the evolution of their subsidiary in the four areas was initiated and driven by the parent company, a balance of the parent company and maquila management, or maquila management (scored a one, three, and five respectively). Additional questions focused on the types of products made, how the product mix had changed over time, background information on the plant manager, the role played by the maquila within the MNC network, and how the parent company's Mexican strategy was changing as a result of increased international competition. We also collected information on the goals the plant manager had set for him or herself, and the nature of the relationship between local and parent company managers.

3. Results

Responses to our question regarding who is responsible for plant evolution/upgrading fall neatly into a normal curve (see Figure Two). After reviewing this distribution as well as information from the interviews, we split our Reynosa sample into three categories; 1) maquilas where evolution/upgrading is primarily parent driven (firms scoring a one or two on the above mentioned question), 2) maquilas where evolution/upgrading is the result of initiatives coming from both the parent company and maquila

management (firms scoring a three), and maquilas where evolution/upgrading is primarily driven by the efforts of local managers (those scoring a four or five). With the goal of providing an accurate picture of the internal dynamics of our sample firms, we present select profiles of maquilas in each of the three groups. We first indicate the size and industrial sector of our sample firm followed by how the plant scored on questions examining trends in the production of more complex products, the use of more capital intensive equipment, hiring additional engineers, and performing additional value added functions.

For firms in all three categories, the key factor triggering evolution/upgrading was gaining charter responsibility for additional products. As stated by one plant manager, “Maquilas are a function of the product that gets transferred to them.” Increased capital investment, hiring additional professional staff, and other positive outcomes were largely a result of the transfer of new product lines to Reynosa. Therefore, in our profiles we pay particular attention to the internal MNC dynamics resulting in additional product responsibility being shifted to Reynosa plants.

a) Parent Driven Evolution/Upgrading - The influence of the parent company in sending new product lines to Reynosa was clearly evident in several of our sample firms. In response to the question regarding who makes the decisions as to where products are made, one plant manager stated “They’re (the parent company) pitching, we’re catching” and later “We can nudge them along, but the final decision is theirs.” As predicted by studies of the internationalization process, maquilas often started out with simple products and gradually moved into more complex manufacturing.

Figure Two: On a one to five scale with one meaning parent driven and a five indicating that these changes have been initiated by plant management, where would this plant score?

		Small, Other		
		Small, Other		
		Small, Other		
		Small, Other		
		Small, Automotive		
		Small, Automotive		
		Small, Electronic		
		Small, Electronic		
		Medium, Other		
		Medium, Other	Small, Other	
		Medium, Other	Small, Other	
	Medium, Electronic	Medium, Electronic	Medium, Other	
	Medium, Electronic	Medium, Electronic	Medium, Other	Small, Other
Small, Electronic	Large, Automotive	Large, Other	Medium, Automotive	Small, Other
Small, Electronic	Large, Electronic	Large, Automotive	Medium, Electronic	Small, Other
Large, Electronic	Large, Electronic	Large, Electronic	Large, Automotive	Small, Electronic
Large, Electronic	Large, Electronic	Large, Electronic	Large, Automotive	Large, Electronic

1	2	3	4	5
Parent company		A balance		Plant management

* Firms employing 125 to 500 are classified as small, from 501 to 1000 as medium, and more than 1000 as large.

Medium, Electronic (4, 3, 5, 4) - The plant manager stated “When we first started operating in Mexico, corporate just wanted to see if we could ship things across the border.” The plant now produces a diverse line of relatively complex consumer products and local staff is responsible for a full range of process, manufacturing, and quality engineering activities. They purchase roughly 75 percent of their inputs from local suppliers and were hiring two additional engineers for their supplier development program. The plant manager stated the push resulting in the plant’s evolution had primarily come from corporate. He had been sent here by the parent company for the purpose of growing the business. A very centralized company emphasizing uniformity in plant layout and operating policies worldwide, the parent had been very supportive and visits from corporate had recently dropped “to only one every month or so.”

In several cases, interviewees emphasized parent companies were basing sourcing decisions on studies of production costs in alternative locations. Based on financial information, the parent company in the following example assigned new work to plants in either the US, Mexico, or China:

Large, Electronic (5, 1, 4, 3) - Based on total cost models, our interviewee stated managers in charge of the strategic business unit (SBU) decide where new products are made. (“Whoever can get it to the barn cheapest”). The Reynosa plant manager attends the SBU monthly meetings (he is the only one from Reynosa that does) but stated his primary role is to make sure strategies set at that level are properly executed. In the recent past the SBU VP had asked him and his boss to develop a new sourcing strategy. His input was considered, but in the end the SBU stayed with the original sourcing configuration. In the near future, they will be producing a new line of relatively complex, premium items. They try to keep their capital intensity down and had “stripped out some of the automated handling” functions the company used when the items were made in the US. They have full control of purchasing, supplier development, a secondary design center, and a product testing lab.

Slow growth in 2001 and 2002 in North America and increasing international competition caused several MNCs in our sample to fundamentally rethink their Mexican strategy. For example, one plant manager stated the company’s CEO had sent a clear message to the division presidents to “migrate” production from higher cost locations to either China and/or Mexico. As a result, the Reynosa plant had added 600 employees over the last two years. In the next profile, the Reynosa plant was the sole beneficiary of the parent’s restructuring efforts and faced little competition within the MNC network:

Large, Electronic (3, 3, 5, 4) - Established in the mid 1990s, the Reynosa operation has always been a “fully functional facility” with full control over purchasing, direct shipping to customers, product development, etc.. Over the last two years, the parent company had closed a number of higher cost facilities in the US and Mexico and moved the work to Reynosa. Already capital intensive, they recently added additional presses and a new paint line. Since in the near future they were going to be the only facility in the parent company performing a certain type of manufacturing operation, they would be producing prototypes for the first time. With the consolidation, Reynosa now represented 40 percent of the revenue generated by the entire company. As a result of their importance, “lots of eyes” were on them all the way up to the CEO. The plant manager stated he did not have to worry about politics in the company. Their performance and cost position put them in a position where they have to fight to turn new products down. “Our problem is that they (corporate) want to push things on us too fast.”

b) Balanced Parent/Subsidiary Evolution/Upgrading - Similar to plants experiencing parent driven evolution, maquiladoras in this second category were the clear beneficiary of parent companies rethinking their sourcing strategy. As they competed for additional charter responsibility, several managers reported conflict with other branches of the MNC. For example:

Small, Other (4, 5, 4, 1) - The parent recently closed a plant in the US and moved the work to Reynosa. The new products are significantly more complex and require transferring capital intensive equipment to Mexico. Corporate “let this plant sit for 10 years kind of idle.” Now they were experiencing significant cost pressure resulting in an increased emphasis on Mexican production. As to who was responsible for the new products coming to Reynosa, the plant manager stated “Nobody could have pushed harder than we did.” At the corporate level, his boss’s boss had been their primary advocate. He stated the parent’s marketing group had fought the re-location due to a perceived negative customer image of products made in Mexico.

In the next profile, conflict was the result of the parent company restructuring the relationship between the product divisions and the manufacturing plants. In effect, the MNC had set up a more competitive internal market:

Medium, Other (5, 3, 5, 4) - Having added 200 employees over the last two years, the plant manager stated products that are easy to build are done here. As their credibility with corporate has increased, they are also getting products some people think you can’t make in Mexico. The parent recently closed three plants in the US and the work performed by one of those was coming here. In addition, starting next year they are going to take on several pilot programs (i.e. new products being mass produced for the first time). As for who was driving these changes, the plant manager stated four years ago the parent company had reorganized. Before, individual plants

produced for only one division. Now, plants are independent and can bid on work from any of the divisions. The reorganization had created significant conflict between corporate and the divisions and the divisions and the plants. With the divisions now little more than sales groups, the professional staff in the US is concerned about losing their jobs and will do everything they can to keep activities such as purchasing in the US. However, plants now have more power and “Corporate is definitely siding with the plants.”

Rapid evolution combined with significant conflict was also evident in the next profile maquila.

In addition to conflict with other branches of the MNC resulting from contested charters, a new plant manager encountered resistance from the existing staff:

Medium, Other (5, 4, 5, 5) - The maquila was moving from a mass production to a mass customization business model. They recently installed a new CNC machine, a new paint line costing close to a half million dollars, and the plant manager was actively lobbying corporate for another piece of more flexible equipment. They had increased the size of their engineering department, installed a CAD software system, and hired a person to market their products to OEM clients. Hired two years ago, the plant manager stated one of his biggest challenges with the new business model was to get buy-in from the local staff. After encountering local resistance, he called his boss and “He reinforced to me that it was a new world.” To increase buy-in he carried out “two purges” of the local staff (19 people total) and hired individuals with a more appropriate skill set. As for who was driving evolution, he was hired by corporate for the purpose of implementing the new business model. Local management had driven the operational level aspects of the new strategy but “with tons of support” from top management. The plant manager had full support of his boss and his boss’s boss, but “One of the biggest problems we run into is we are viewed as threatening the job security of professionals in the US. There is a clear desire for you not to be successful.” They had received little cooperation from the US engineering group and the corporate logistics staff. As a result, with support from his boss and informal consent from others they regularly perform activities in Reynosa that formal procedures state should be done in the US.

Up to this point, we have profiled successful initiatives. There were a limited number of cases where the parent company was not supporting local efforts. For example:

Small, Electronic (3, 5, 1, 1) - They had recently entered market segments where customers require more complex products. As a result, they were leasing additional equipment and automating certain labor intensive processes. In response to the question of who had control of customer support and purchasing, the plant manager stated “I want to work directly with clients and suppliers but the strategy followed by the corporate office is different.” As a result, “Sometimes I fight with them.” If clients want to contact the plant, they first have to call a person in California, who then calls someone in Cincinnati, who will then call him. The plant manager stated his division does this because people in the US are trying to protect their jobs. The plant manager talked to the firm’s

owner about these inefficiencies at a company sponsored social event and at the same time lobbied for permission to bid on several new contracts. He appeared to have received little support and the plant recently laid off 35 employees.

Within this category, there was significant diversity in the explanations provided by managers for what was driving upgrading/evolution. In a large maquila producing auto parts, local management had full control of purchasing, more direct customer contact, and more involvement through “virtual teams” with design engineering. As for who was responsible for these changes, the plant manager stated both he and corporate came to the conclusion the plant should take on more responsibilities at the same time. In addition, he brought out several publications containing checklists of what capabilities first and second tier suppliers were required to have to sell to the Big Three. His interpretation of these listings was they needed design capabilities as well as a number of other value added functions on-site. To attract additional work, credibility with the parent company was frequently mentioned as being very important and to our surprise was something that could develop over a relatively short period of time. At an electronics maquila, a plant manager on the job for only a year stated the parent was transferring four new lines to Reynosa. Due to the poor performance of the prior management team, in the past Reynosa had been losing products to a parent company facility in South Korea. To make these sourcing decision, the parent was using a external database. One of the first things the new plant manager did was convince corporate to base sourcing decisions on what he saw as more accurate, company generated information. This plus local productivity improvements made the Reynosa plant appear much more competitive and they were able to attract more work. While he stated plant evolution was a result of both parent and local efforts, local initiative was clearly important (“We’re selling it, and they’re buying it”).

c) Subsidiary lead evolution/upgrading - There were several clear examples in our sample of subsidiary lead initiatives resulting in evolution/upgrading. At the first profiled maquila, a new plant manager with two decades of maquiladora experience was able to reverse the fortunes of a struggling plant. In the second, over a period of years the efforts of a high energy, entrepreneurial oriented plant manager resulted in both explosive growth and local control over a variety of value added functions:

Small, Other (5, 5, 4, 4) - This plant was producing some of the most complex products made in the parent company system. Already capital intensive, they recently installed over four million dollars worth of high tech presses and now had better equipment than US plants. At the next corporate meeting, the plant manager was proposing the centralized engineering group in the US be disbanded and moved out to the plants. He was 97 percent certain this would happen and emphasized their record of success gave them a lot of credibility with corporate. The plant manager had been hired four years ago. When interviewed by the CEO and owner, he asked what their plan was for the Mexican operation. Were they going to move down labor intensive products they were not making money on, more complex products they were still making money on, or the really innovative stuff? The owner and CEO had just looked at each other and finally one of them blurted out "Yea." As part of his interview, they developed a strategic plan for Mexico. Back in Reynosa, the first thing he did was replace the existing staff.

Medium, Other (5, 5, 4, 4) - The plant had added 200 employees over the last two years and was transitioning towards a mass customization model resulting in increased complexity on the shop floor. As for production technology, "We are doing everything up to and including robotics." To justify this investment, the plant manager had convinced corporate to stretch out the required payback period from one to three years. When asked if they were doing design engineering, he stated "According to corporate we're not, but unofficially yes." Years back, the plant manager had "very gingerly" convinced the parent to stop buying from high cost suppliers in the US, transfer control of purchasing to Reynosa, and allow them to source from Mexico. His latest initiative was to gain full control of distribution and continue "to get corporate out of the loop."

In these two maquilas, very proactive plant managers clearly wanted to gain more control and add additional functions to the Reynosa operation. Two other plant managers fit a similar model. At a smaller maquila, the plant manager stated some of his friends had started the company. After setting up a plant in Poland to supply the parent's European operations, he had been sent to Reynosa to establish a similar facility supporting North American sales. As a part owner, he had the full support of his boss

(“I’ve turned companies around for him”). In Reynosa, they were dealing with customers directly, setting up contracts, finding local suppliers, and in general, “taking work away from corporate.” Our interviewee stated “Right now the supply chain is our biggest single problem” and later “I’m going to take it over from corporate.” When asked if there would be resistance to this, he stated “Yes, there are people in Cleveland that say I can’t do that.” However, he emphasized the Reynosa plant was making money and he was not particularly worried about the reactions of what he viewed as middle management bureaucrats at the corporate office. In addition, he had learned “It’s better to apologize rather than to ask for permission.” At the second maquila, a new plant manager had been able to double the number of employees in less than two years. Owned by a European MNC, one of their many local initiatives was to determine the possibility of locating labor intensive operations in Cuba, exporting those products to Mexico, and after further assembly sending them to the US as NAFTA qualifying goods. The plant manager stated corporate establishes the ground rules for what you should be doing. From that point on, “Whether you grow 10 percent or 100 percent per year is up to you.” This person’s approach was perhaps a bit too proactive and towards the end of the study period he was removed as plant manager. According to a person on his staff, he was let go because “He didn’t get along with people in Europe.”

In contrast to this group of very driven, entrepreneurial oriented plant managers, in two Reynosa maquilas local management teams were taking primary responsibility for evolution/upgrading not because they wanted to but rather due to a perceived lack of corporate interest and support. When asked about his relationship with the parent company, one plant manager stated “They don’t even bother us. If we are making money, they leave us alone.” When asked if corporate supported the goals he had set, he stated “Not really” and corporate was “kind of neutral” and “indifferent.” “They are not

really supportive, but they don't inhibit things either." Another plant manager spoke at length about the lack of corporate support and the strategies Reynosa management had developed to grow:

Large, Electronic (4, 4, 3, 3) - The plant had added 1,500 employees over the last five years. Products were becoming more complex as a result of increased customization and more electronic components. To improve quality and efficiency, they were automating various processes. Another priority was to add a testing lab. When asked who was responsible for these changes, the plant manager stated "Since day one" it was Reynosa management that had to attract new business to the plant. He mentioned one meeting at corporate where they were proposing something new and two minutes into the presentation the head technical person shot the idea down. When asked if they were developing their organizational capabilities as quickly as they should, the plant manager stated they were not and the plant would be doing much better if they didn't have to spend so much time selling themselves. "We are on our own" and "struggling daily." He had talked with other plant managers about the lack of support the plant receive from corporate and "Nobody believes the crap we go through." To attract new business, members of the Reynosa management team regularly visit the company's US plants to find products that make sense to transfer to Reynosa.

As briefly discussed in the introduction, maquiladoras in many segments face intense competition from China and other lower cost countries. Having lost the plant's original charter, one plant manager took extraordinary actions in an attempt to keep the Reynosa plant going and his management team intact:

Small, Electronic - Due to cost pressures, the parent began sourcing from China rather than Reynosa. At the same time, the company was bought by a very large conglomerate. Given their shrinking charter, the plant manager first brought the president of the original parent (now a top executive in the conglomerate) to Reynosa. The plant manager sold this individual on the idea that while it didn't make sense to continue with their existing product line, they had a great management team and perhaps they could produce for other divisions within the conglomerate. The president went along with this proposal and together they presented the idea to the conglomerate's vice chairman. After gaining corporate approval, the plant manager visited roughly 45 parent owned facilities in the US, Europe, and Asia with the goal of working with management in those locations to identify products that could be profitably transferred to Reynosa. This effort had been successful; six production lines were transferred to Reynosa and they successfully "filled up" the plant. The parent then decided to sell off the division that included the Reynosa maquila. Knowing it was not going to continue as part of the MNC network, the various divisions pulled their lines out of Reynosa (the last line shut down the week of our interview). The plant was eventually closed. Our interviewee eventually became the plant manager at a large start-up plant in the area.

Returning to our research questions, the information collected from our sample of Reynosa plant managers provides strong evidence subsidiary initiative is an important driver of industrial upgrading in Mexico's EPZ industry. For the second research question, i.e. which of the alternative drivers of subsidiary evolution is more strongly associated with industrial upgrading, we conducted a statistical analysis of the three maquila categories. As shown in Table Two, the non-parametric Kruskal-Wallis test reveals one significant difference within our data. When compared to sample firms where evolution is primary initiated by the parent, there is a stronger trend to add additional value added functions in maquilas where evolution/upgrading is driven primarily by the efforts of local management. Taken as a whole, both the quantitative and qualitative evidence indicate evolution/upgrading is taking place at a relatively rapid pace in all three maquila categories.

Table Two: Drivers and Maquiladora Evolution/Upgrading

	Parent Driven	Balance Parent/Plant	Plant Driven	Kruskal-Wallis ANOVA (F/sig.)	Pairs significantly different
Product complexity	4.0	3.5	3.9	2.4/0.30	None
Capital intensity	2.9	2.8	3.2	.8/0.67	None
Engineering	2.9	2.8	3.2	.4/0.82	None
Other value added activity	2.5	3.3	3.8	6.4/0.04	Plant with Parent

All measures one 5 point Likert scales where 1 = no trend, 5 = strong trend

4. Discussion and Conclusions

Researchers studying subsidiary evolution have proposed increased responsibility within MNC networks are something earned through the entrepreneurial activities of subsidiary managers rather than given by the parent company. Based on a sample of firms operating as part of Mexico's EPZ program, we found considerable evidence indicating subsidiary initiative represents an important driver of maquiladora evolution/upgrading. Our original Reynosa sample included 50 maquilas. For a variety of reasons, ten of these plants were excluded from the full analysis. Using quantitative and qualitative information collected through semi-structured interviews with plant managers at the remaining 40 firms, the parent company represents the primary instigator of evolution/upgrading at 10 plants, both the parent and local managers appear to be more or less equally responsible for initiatives at 17 maquilas, and local managers are the primarily driver of evolution/upgrading at the remaining 13 sample firms.

This study represents one of the first systematic efforts to extend subsidiary initiative research to Latin American as well as the global EPZ industry. Somewhat to our surprise, the parameters set by the EPZ production model do not appear to prevent many forms of subsidiary initiative from taking place. Firms in all three evolutionary categories appear to be gaining charter responsibilities for more complex products, increasing their use of capital intensive machinery, taking on additional engineering functions, and assuming responsibility for other value added activities. Our interviews and plant visits in Guadalajara provide further evidence subsidiary initiative is an important factor leading to evolution/upgrading in MNC subsidiaries in Latin America. At one very large contract manufacturer controlled by a US MNC, the operations manager stated in their company the "casa matriz" (corporate office) does not exist in the traditional sense and the Guadalajara plant operates as a "franchisee." Competing within the MNC network (the plant was losing product lines to parent company facilities and

others in China), plants are treated as stand alone businesses that determine their own strategy. This independence allowed them to quickly rethink what they were doing at the onset of the maquila crisis and transition to a business model where they are somewhat shielded from lower cost, overseas competition.

Our findings may have important implications for future studies of subsidiary initiative. The Birkinshaw and Hood (1998) framework proposes a subsidiary's role is largely determined by choices made by the head office, the entrepreneurial efforts of subsidiary management, or local environment determinism. For our EPZ sample, these three categories do not fully capture the forces responsible for local evolution/upgrading. In one of the Reynosa plants dropped from the final analysis, when asked who was responsible for local evolution the plant manager stated competition in product markets and customer preferences were driving the actions taken by his firm. Since consumers are naturally going to buy the highest quality, lowest cost products they can find, the parent has no choice but to respond to market forces and in this particular case transfer work from Reynosa to China. Statements from several of the plant managers suggest international competition is one if not the most important factor responsible for local evolution/upgrading. Facing increasing cost pressures and slow growth in US markets, in an effort to stay profitable many of the parent companies of our sample firms responded by closing higher cost production facilities in the US and migrating the production of complex products to wherever those items could be produced most efficiently. In addition to international competition, new technology and the requirements of demanding international customers were factors largely external to the MNC resulting in charter gain and loss. The international commodity chain framework (Bair & Gereffi, 2001; Gereffi, 2003) with its explicit consideration of firms located throughout the value chain may provide a useful perspective for future studies for subsidiary evolution/upgrading.

This study set out to determine if the strategies and tactics employed by the now retired Tijuana plant manager to gain a design engineering charter are being used by maquiladora managers on a broad scale. Our findings suggest corporate entrepreneurship at the subsidiary level represents one of several important drivers of the evolution/upgrading process for EPZ plants in Reynosa and Guadalajara. Academicians studying economic development in Latin America frequently end articles such as this with recommendations for policy makers in host country governments and/or international development institutions. Our results do not easily lend themselves to new policy initiatives. In fact, the forces we identify as representing the primary drivers of maquiladora development are largely outside the influence of the host country policy makers. As a relatively unimportant player in the process, perhaps the best the host country can do to facilitate evolution/upgrading is on subsidiary by subsidiary basis work with local managers to remove regulatory obstacles that prevent local initiatives from succeeding. As is the case with so many other dynamics of today's international economy (e.g. international interest rates, IMF policies, commodity prices, etc.), factors having a profound influence on the success or failure of Latin American economies are not under the direct control of Latin American policy makers.

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