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Moving U.S. Manufacturing Offshore: Is Mexico a Viable Choice?

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Moving U.S. manufacturing offshore can be a controversial topic that sparks passionate debates. This article explores several aspects of manufacturing offshore and proposes guidelines intended to educate both decision makers and affected employees to act in an informed way. The article examines why Mexico is the top choice for many U.S. companies, analyzing factors that make Mexico very attractive while noting issues that can result in failure.

I. Introduction.

The decision to move manufacturing from the United States to Mexico is not a new concept. In fact, it has been done innumerable times over the past thirty years, not

always as successfully or as smoothly as planned. For many U.S. companies, manufacturing offshore has been part of their strategic plans for years. With the implementation of the North American Free Trade Agreement (NAFTA) and the peso devaluation in 1994, more and more companies are contemplating the question of whether to move manufacturing operations to Mexico. For others, the question is not whether but how they move manufacturing to Mexico. Regardless of what stage a company is at with respect to manufacturing in Mexico, informed decision-making is critical to success.

The respondents to our research were involved with offshore manufacturing at various companies such as 3M, Pillsbury, SIMS Deltec, Thermo King Corporation, and TORO Company, and as such, have been able to observe processes used to make these decisions and the strong emotions surrounding them. Throughout the process with these companies, an objective position has been maintained and judgment was never passed without knowing all the facts.

The motivation for this research study was twofold. First, to provide a set of guidelines for the decision makers to help them make informed and correct choices that will provide the best chance for success. Second, to provide background information for all employees affected by such moves so that they can better understand why these decisions are made and critique the decisions in an informed way. Much of the information gathered in this project can be applied to outsource or offshore manufacturing in general. However, in order to keep the scope of the project manageable, the focus of this research is on moving manufacturing from the United States to Mexico. Even though labor cost is the motivating factor to move manufacturing to Mexico, it is very important to realize that not all manufacturers can solve their cost dilemma by moving to Mexico. Other factors such as labor content, volume, product size, and product complexity also determine the financial success of the move. Performing a detailed financial analysis that includes hidden costs is critical.

The principal reasons to move manufacturing offshore are outlined and important issues are explored such as: the impact on the United States, Mexico versus other areas of the world, trade legislation, options available for manufacturing in Mexico, where to locate business in Mexico, and hidden costs.

II. Reasons to Move Manufacturing Offshore.

Among many factors driving the decision to move offshore, the following provide the basis for the move.

A. LOW LABOR COSTS.

It is commonly viewed that low labor costs is the main and sometimes only reason companies move manufacturing offshore. With labor costs in developing nations around the world being half to one-tenth the cost in the United States, the desire for company executives to cut costs is overwhelming. For example, Swingline Staplers decided to move assembly lines from two locations in New York to Mexico, saving the company \$12 million per year and affecting 450 workers in New York.¹

1. See Tom Robbins & Claire Serant, *Swingline Staplers to Move Two New York Plants to Mexico*, N.Y. DAILY NEWS, July 15, 1997, at 6.

Sometimes the attractions of low labor costs and substantial manufacturing savings are not enough to get companies to move offshore. A disciplined and structured approach is needed to prevent inefficiencies that can negate advantages of low cost labor. Realizing high efficiencies is essential to absorb overhead, freight, and duty charges associated with offshore manufacturing. High caliber management is also very important. If these and other important aspects of manufacturing offshore are recognized, the effort can be enormously successful. Labor laws and common practices in a particular country can be beneficial extensions to low labor wages. These laws and practices affect the true cost of labor both positively and negatively. Conditions in Mexico are good for the employer since labor laws are flexible compared to the United States, and there is a 48-hour workweek, which results in less overtime payments.²

B. PROXIMITY TO LOCAL MARKETS.

The only reason that comes close to low labor costs in motivating a company to move manufacturing offshore is proximity to local markets. Although this reason was not specifically researched, it was quite apparent from literature review. It also fits with the norm that if there is a large market for a product in a specific area of the world, significant savings can be realized through reduced shipping and inventory costs by manufacturing products in that region.

C. CLOSER TO SUPPLIERS.

Being closer to component suppliers is a reason that many electronics manufacturers moved to Asia. This is rarely the case in Mexico. According to the National Maquila Association, only 2 percent of components assembled in Mexico are from Mexican suppliers due to poor quality, higher costs, and unreliable delivery of components.³ The National Maquila Association is an association of "maquiladoras," the name given to foreign run factories in Mexico that are allowed to import components duty free for processing and export as finished products.

D. CLOSER TO CUSTOMERS.

Since Mexican suppliers only account for 2 percent of the components assembled in Mexico, being closer to customers is a strong motivation for moving manufacturing to Mexico. This trend is particularly strong in the automotive sector where manufacturers have encouraged their suppliers to relocate or set up manufacturing near their facilities in Mexico.⁴ An example of this is Sheldahl Inc., an automotive electronics maker that moved some manufacturing to Mexico not only due to lower labor costs, but because their customers have factories there.⁵

2. See Charles Darwent, *Motoring Away from the Maquila Mainstream*, CORP. LOCATION, May/June, 1997, at 28-31.

3. See Steven Lewis, *A Piece of the Action*, BUS. MEXICO, May 1, 1997, at 19.

4. See Charles Darwent, *Mexico: Feel the Quality*, CORP. LOCATION, Sept./Oct. 1998, at 68-74.

5. See *Sheldahl Shifting to Mexico*, AUTOMOTIVE NEWS, May 11, 1988, at 26f.

E. LOW INVESTMENT IN MANUFACTURING INFRASTRUCTURE.

Lower investment in land and utilities can also be a motivation to move manufacturing offshore. Industries that need a lot of space per dollar of product produced or consume high amounts of energy or water would gravitate to locations where they are plentiful and inexpensive. Chrysler and GM moved operations to Saltillo in the Mexican state of Coahuila to take advantage of the low land prices and inexpensive utilities, as opposed to low labor costs. Industrial real estate was available at \$13.50 per square meter per year in the Saltillo industrial park.⁶ Mexico's largest developer of maquiladoras, Grupo Bermudez, leased space in 1995 for around \$5 a square foot per year.⁷

F. EXISTING PLANTS OFFSHORE.

Once the first product line has been moved offshore for one of the above reasons, the decision to move another product line to the same plant is a much simpler task. Moving additional product lines to an existing facility not only takes advantage of above described benefits, but it also consolidates operations and reduces the overhead for the entire offshore facility. An example of this is the Ecko Group, which decided to relocate most of its cleaning products manufacturing in order to regain a higher profit margin. The driving force for moving to Mexico was that it could locate the manufacturing in a facility attached to the plant where they currently make kitchenware. Since the processes were similar, it could take advantage of synergies from having operations in the same facility.⁸

G. INCENTIVES.

Many countries use incentives such as tax breaks or free land to lure manufacturing. These incentives are usually provided to cover up deficiencies such as political unrest, questionable human rights policies, poor skills of the labor force, and lack of infrastructure.⁹ In light of these deficiencies, such incentives should not be used as reasons to move manufacturing offshore, but rather as a possible factor in deciding where to move manufacturing.

H. MOVING BACK TO THE UNITED STATES.

It is rare to see U.S. companies move manufacturing from overseas locations back to the United States, but it does occur. In 1996, Superba Cravets, the nation's largest neckwear company, moved operations from Puerto Rico to Los Angeles in order to provide greater speed and service and to shorten the delivery cycle.¹⁰ Palo Alto Products, designer of the Palm Pilot business organizer, is another example of moving manufacturing back to the United States from Asia. It built a new injection molding facility in

6. See Darwent, *supra* note 2, at 28-31.

7. See Christopher Palmeri, *The Flip Side of Devaluation*, FORBES, Feb. 13, 1995, at 44.

8. See Dawn Hill, *Ecko Cleaning to Mexico*, HFN THE WKLY NEWSPAPER FOR THE HOME FURNISHING NETWORK, Oct. 21, 1996, at 97.

9. See Bruce Rayner, *Promising Lands*, 24 ELECTRONIC BUS., Feb. 1998, at 71.

10. See *Superba Cravats Drops Offshore Production*, DAILY NEWS RECORD, Oct. 4, 1996, at 4.

Texas near its metal component supplier, driven by cost sensitivity, speed to market in the computer industry, the trend toward acquisitions, and closer operations of plastic and metal suppliers.¹¹

III. Impact on the United States.

The impact on the United States of moving manufacturing offshore should be considered because U.S. companies employing its citizens need to look at possible ramifications for the nation, companies, and their employees.

A. THE ARGUMENTS.

For every argument to move manufacturing offshore, there is a counterargument for staying in the United States. A 1996 editorial proclaimed that low wage countries like China and Bangladesh do not threaten workers in developed countries because lower wages tend to be linked to lower productivity and these countries will use their gains to buy products from developed countries.¹² Another fear mentioned is that developing countries will combine their low wages and the developed country's technology provided to them to become supercompetitive.¹³ The editorial dispels this fear by saying that increased wages and a stronger exchange rate will offset productivity increases.¹⁴ This happened in South Korea, where wages have gone from one-tenth to two-fifths of the U.S. levels in ten years. Many people still fear the idea of losing manufacturing jobs. But the editorial argues that activities like design, marketing, and finance add more value to products than manufacturing; therefore, there is no reason to worry about where it is made.¹⁵ Although it acknowledged that the loss of low paying jobs is painful to workers, the editorial maintained that developed countries will benefit as a whole from a move toward higher skilled, better paying jobs.¹⁶

Jim Smith uses Japan as an historical example of what can happen when assembly is moved outside the United States.¹⁷ At first, Japan only assembled simple products using components imported from America. This led to Japan making components and basic subassemblies. Once a component-manufacturing base was created, making the entire product was an easy next step. Soon stores found it cheaper to buy the same product directly from Japanese manufacturers. Smith's argument about Japan plays right into an opposing view from the 1996 editorial that suggests as productivity in developing countries increases, wages increase and it becomes a new market for the developed country's products.¹⁸ Increased wages resulting from higher productivity occurred in Japan and much of Japanese manufacturing is no longer done in Japan.

11. See Roger Renstrom, *Computer Molder Moving Offshore Work to U.S.*, PLASTIC NEWS, Jan. 1998, at 7.

12. See *Invasion of the Job-Snatchers*, THE ECONOMIST, Nov. 2, 1996, at 18.

13. *Id.*

14. *Id.*

15. *Id.*

16. *Id.*

17. See Jim Smith, *Outsourcing to Out of Business*, ASSEMBLY, Dec. 1998, at 120.

18. See *Invasion of the Job-Snatchers*, *supra* note 12, at 18.

The shift in developed countries from a manufacturing economy to a service economy is often parallel to what happened years before with agriculture. At the beginning of the twentieth century, 68 percent of Japan's labor force worked on the land, compared to 44 percent of America's labor force and about 20 percent of Britain's labor force. Today, agriculture accounts for only 7 percent of workers in Japan, 3 percent in America, and 2 percent in Britain. The change from agriculture to a manufacturing economy did not bring disruption to these countries, nor should the fading of manufacturing.¹⁹

Although manufacturing jobs are projected to decline in the United States by 350,000 (from 18.5 million to 18.2 million) during 1996–2006, total employment in the United States is projected to increase by 18.6 million, from 132.4 to 151 million. This reflects a continued shifting of jobs from sector to sector. For the ten-year period from 1986–1996, manufacturing lost 493,000 jobs in the United States.²⁰

B. ECONOMIC CHANGE.

The world economy is experiencing two major changes.²¹ First, a substantial amount of industrial production has been moving from the developed world to developing areas. What many Americans believed to be “Made in the USA” had in fact been a product of factories from around the world as far back as the 1980s or earlier. By 1990, forty percent of IBM's employees were outside the United States. Whirlpool, America's leading supplier of domestic appliances, made most of its products in Mexico and Europe. In 1990, General Electric was the biggest private sector employer in Singapore, where American-owned factories employed 100,000 people. By the early 1990s, about one-fifth of the total output of American firms was being produced outside America.

Second, in developed countries, the balance of economic activity is moving from manufacturing to services. Despite the fact that two-thirds of output and four-fifths of employment in developed countries is in the service sector, the prevailing feeling still is that manufacturing somehow matters more than any other economic activity. These two changes can really be combined as part of one economic change, “The Globalization of the Economy.” Manufacturing has become an international affair. Any country that is willing to use the skills it possesses will gain from joining this global supply chain.²² Moving manufacturing to low wage developing countries is only a small part of the greater globalization of the economy. This is supported by the fact that three-fourths of foreign investment by U.S. multinationals is in other high wage developed countries.²³

19. See Liain Carson, *The World as a Single Machine*, THE ECONOMIST, June 20, 1998, at 3–5.

20. See James C. Franklin, *Industry Output and Employment Projections to 2006*, MONTHLY LABOR REV., Nov. 1997, at 39–57.

21. See Carson, *supra* note 19, at 3–5.

22. *Id.*

23. See David L. Wilson, *Do Maquiladoras Matter?*, MONTHLY REV., Oct. 1997, at 28.

IV. Mexico Versus Other Areas of the World.

Deciding to move manufacturing offshore is followed by a long list of critical business decisions that will determine the success of the move. This section discusses the criteria used to decide where to move manufacturing, as well as the motivation to move to Mexico.

A. SELECTING A LOCATION.

It is relatively easy to generate a short list of possible locations if the reason to move is to be near local markets, customers, or suppliers. However, if the reason is mainly low wage labor, other related issues (political unrest, questionable human rights policies, poor skills of the labor force, or lack of infrastructure) must be evaluated in order to make a decision that will ensure positive results.²⁴

B. WHY MEXICO?

The motivation to move manufacturing from the United States to Mexico has been fueled by several factors, such as favorable trade legislation, competitive labor costs, proximity to the U.S. market, ability to manage essentially nearby operations, lower shipping and transportation costs (compared to Asia), and convenience of doing business in the same or close time zones.²⁵ Therefore, it was not surprising in a survey that 68 percent of U.S. direct investors place Mexico first among Latin American countries.²⁶ Mexico is not only one of the most popular countries for U.S. investors, but it also ranks number two only behind China as global investors' favorite location in the developing world with \$36.8 billion in gross exports from maquiladoras in 1996.²⁷

C. THE DOWNSIDE OF MEXICO.

Although conditions in Mexico are good, there are still many issues and challenges for companies to be aware of and concerned about when moving manufacturing to Mexico. Some investors are apprehensive about what will happen next given the recent macroeconomic ups and down in Mexico. The main concern is over Mexico's current budget constraints and continued fall in oil prices, which makes up 40 percent of the country's earnings.²⁸

The post-NAFTA foreign investment boom has done strange things to Mexico's labor supply. In some border areas, employee turnover runs 15 percent per month compared to 20 percent per year in the United States for comparable assembly jobs during the same time period.²⁹ This can be very expensive when a company requires extensive training

24. See Rayner, *supra* note 9, at 7.

25. See *Survival of the Fittest*, APPAREL INDUSTRY MAG., May 1998, at 34-36.

26. See Darwent, *supra* note 2, at 28-31.

27. See Robbie Farley-Villalobos, *Hey, Maquiladoras, Come on Over*, N.M. Bus. J., Sept. 1, 1997, at 15-16.

28. See Darwent, *supra* note 4, at 68-74.

29. See Rolando Quintana, *A Production Methodology for Agile Manufacturing in a High Turnover Environment*, 18(5) INT'L J. OPERATIONS & PRODUCTION MGMT, 453 (1998).

of its employees. Generally, the farther away from the border, the lower the turnover becomes.³⁰ Near the border there is a lower commitment to stay for any length of time, as the Mexican workers who decided to leave their job did not take into consideration the level of wages or type of work they were doing.³¹

V. Trade Legislation.

Favorable trade legislation has been the hallmark of U.S.–Mexico trade relations. Highlights of these relations are the maquiladora program that Mexico started in 1965 and NAFTA, signed in 1994.

The maquiladora program allows equipment and components to pass duty free into Mexico, where they are assembled into products by low wage Mexican labor and shipped to the United States, paying customs duties on only the value added non-U.S. portion of the product. These duties are generally very low because they reenter the United States under the General Agreement on Tariffs and Trade (GATT) system of preferences for imports from developing nations.³² Initially, all products assembled in maquiladoras had to be exported out of Mexico. This restriction was loosened by the decree of 1983, which allowed 20 percent of production to enter the Mexican market; further relaxed in 1989, it now allows one-third of the maquiladora production to enter the Mexican market.³³ Through July 1998, maquiladora exports reached \$29.1 billion and investment \$1.1 billion. Maquiladora exports represent 44 percent of Mexico's overall exports.³⁴ In 1997, maquiladora exports reached \$40 billion and the industry employed nearly one million people, which is over 15 percent of the total employment in Mexico's manufacturing sector.

From 1982 to 1989, maquiladora plants increased by 183 percent from 585 to 1655 and the number of employees increased by 238 percent from 127,048 to 429,700.³⁵ After a slowing in the growth of maquiladoras from 1989 to 1994, the boom was on again. The thirty-year growth of the maquiladora industry is shown in Figure 1.

Much of Mexico's international appeal is due to NAFTA, as it grants goods produced in Mexico automatic right of entry, tariff free, into the U.S. and Canadian markets.³⁷ There are restrictions under NAFTA's rules of origin that prevent non-North American goods from passing into the United States duty free via Mexico.

30. See Darwent, *supra* note 4, at 68–74.

31. See Lisa Hope-Pelled & Kenneth Hill, *Employee Work Values and Organizational Attachment in North Mexican Maquiladoras*, 8 INT'L J. HUMAN RESOURCES MGMT 495, 496–507 (1997).

32. See William C. Gruben, *NAFTA Revisited: The Impact of the North American Free Trade Agreement on Maquiladora Employment*, TEX. BUS. REV., Dec. 1998, at 1–5.

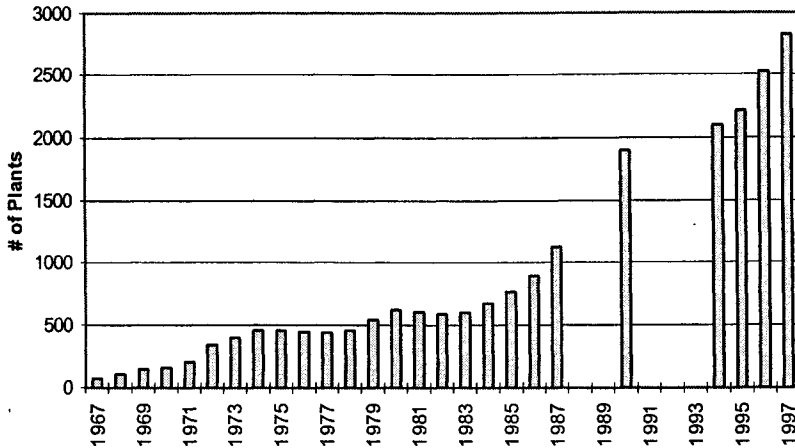
33. See GRAY NEWMAN & ANNA SZTERENFELD, *BUSINESS INTERNATIONAL'S GUIDE TO DOING BUSINESS IN MEXICO* (1993).

34. See *Maquiladoras Continue to Attract Investment*, J. COM., Sept. 18, 1998, at 8A.

35. See Elsie L. Echeverri-Carol, *Is the Mexican Peso Devaluation Good News for the Maquiladora Industry?*, TEX. BUS. REV., Apr. 1, 1995, at 5.

36. See Leslie Sklair, *Assembling for Development: The Maquila Industry in Mexico and the United States*, 1993; see also Elamex Corp. S.A. de C.V., Presentation, *Contract Manufacturing and Shelter Services*, 1998 [hereinafter Elamex and Sklair].

37. See *The Alternative Maquilas*, CORP. LOCATION, Jan. 1, 1997, at 22–23.

Figure 1. Maquiladora industry growth.³⁶

The maquiladora industry started its second boom after the peso crash of 1994.³⁸ Table 1 shows the maquiladora industry growth for different sectors between 1993 and 1997.

The maquiladora program and NAFTA are undoubtedly important to investment in Mexico by the United States and other international investors. However, if it were

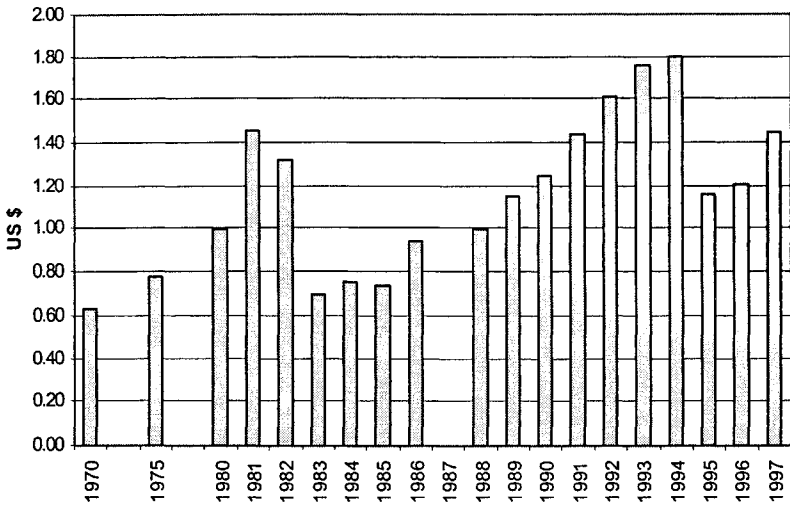
TABLE 1
Maquiladora industry growth by sectors, 1993 to 1997.³⁹

	1993		1997		% change	
	Plants	Employ (000's)	Plants	Employ (000's)	Plants	Employ (000's)
Industry total	2143	54.6	2823	948.7	31.7	73.6
Processed, prepared, frozen foodstuffs	60	7.3	77	12.1	28.3	65.7
Textiles, apparel	399	69.1	771	181.6	93.2	162.8
Footwear, leather goods	57	7.6	62	9.6	8.8	26.3
Furniture & accessories	295	24.5	331	45.2	12.2	31.0
Chemicals	125	15.6	117	17.7	(6.4)	79.2
Transportation equipment	171	124.5	199	183.6	16.3	47.4
Assembly, repair of machinery, and tools	45	5.3	42	9.5	(6.7)	79.2
Electrical products and components	534	189.5	591	333.5	10.7	76.0
Toys, sporting goods	41	7.8	56	14.9	36.6	91.0
Other manufacturing	306	57.7	424	104.9	37.2	81.8
Services	110	26.6	153	35.9	39.0	34.9

38. See Gruben, *supra* note 32, at 1-5.

39. See Elamex and Sklair, *supra* note 36.

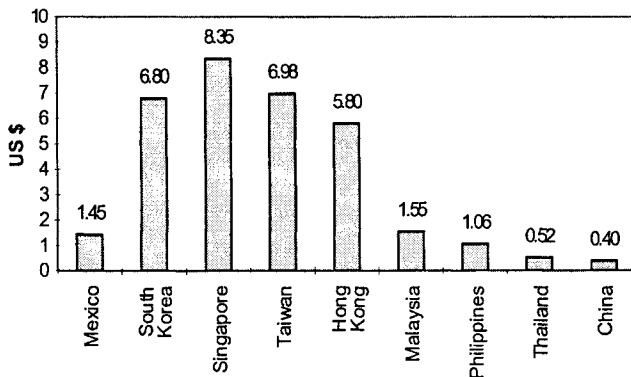
Figure 2. Average direct labor wage rate in Mexico.⁴⁰



not for low labor costs, favorable trade legislation would not have the same impact. The peso devaluation in 1982 and 1994, while devastating to Mexican's buying power, actually made Mexico a more competitive labor market and, therefore, more attractive to foreign investors. The impact on average Mexican labor wages due to the peso devaluation in 1982 and 1994 is illustrated in Figure 2.

These drops in Mexican wages have made Mexico more competitive compared to Asian labor, which was not the case in 1983, as shown in Figures 3 and 4.

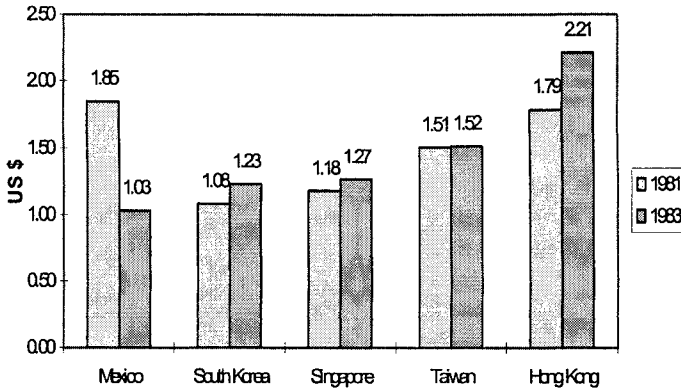
Figure 3. Comparison of average direct labor hourly wage rate for 1997: Mexico versus Asia.⁴¹



40. *Id.*

41. *Id.*

Figure 4. Comparison of Mexican versus Asian wages (benefits included) for 1981 and 1983.⁴²



In addition to low labor costs, Mexico can offer qualified engineers and managers, and complex high-tech facilities, including an increasingly sophisticated cluster in the automotive industry.⁴³

VI. Avenues into Mexico's Manufacturing Industry.

The following three options are available to enter the manufacturing industry in Mexico. Features of one can be blended into another, as the company manufacturing the product (product company) decides what is best for it.

A. SUBCONTRACTING.

The subcontracting method can take many forms depending on the contract agreed upon between the product company and the contract manufacturer. This contract can result in a "Turnkey" operation, where the only thing the product company provides is a specification to an operation, or where the product company supplies materials, equipment, and has significant input into operations and procedures. The contract usually provides for payment by the piece part or by the hour.

B. SHELTER PROGRAM.

The shelter program is similar to the subcontracting option in that it can take many forms depending on the agreement between the product company and the shelter company. The key difference between the two is that with the shelter program the product company manages the production process, whereas with subcontracting, the contract

42. See Newman & Szterenfeld, *supra* note 33.

43. See Tim Venable, *Manufacturing Moving Ahead in Mexico*, 43 SITE SELECTION 468 (1998).

company manages the production process. The shelter companies can provide services in the following general areas: human resources management, materials management, administrative support, legal matters, environmental, and management information systems services.

C. DIRECT OWNERSHIP.

With the ownership option, it is not necessary to own the facility. The main difference between the direct ownership and shelter program is that with the latter the product company has no corporate presence in Mexico. Many firms lease a production facility. Under the direct ownership option, shelter companies are frequently used to handle specific tasks where the product company does not have the expertise. However, whether leasing or owning under the ownership option, the product company usually has to obtain board and corporate resolutions to incorporate in Mexico. It has to retain U.S. and Mexican counselors, establish a Mexican corporation, company, or branch subsidiary, and secure all required permits and licenses. It also has to create and implement short- and long-term legal structures for various tax issues related to Mexico, U.S., U.S.-State, and final consolidation considerations for parent company tax returns in the country of origin, hire employees for all positions in Mexico, meet all Mexico and U.S. customs requirements, and provide direct support to the Mexican subsidiary.

VII. Where to Move Manufacturing in Mexico.

This is yet another important decision that requires significant investigation and information. Again, this decision may be determined by some of the same reasons for moving to Mexico, such as existing plants, supplier base, or proximity to customers. In addition, technological expertise, or shortage of water in certain areas may also influence the decision.

The majority of Mexico's economic development has been in the roughly triangular areas defined by Mexico City, Guadalajara, and Monterrey. However, a secondary area of economic development has risen in the past twenty years along the border with the United States, where maquiladoras have been growing in places like Tijuana, across the border from San Diego, and Ciudad Juarez, across the border from El Paso.⁴⁴ Higher wages and higher turnover are typically the norm in areas closer to the U.S. border.⁴⁵ Table 2 identifies several cities in Mexico along with the number of maquiladora plants and employees in each area.

VIII. Hidden Costs.

Often companies conduct financial analysis capturing significant cost savings that can be gained by moving manufacturing offshore, but forget to include many hidden costs, or do a risk analysis. Even after the move, many of these costs still remain hidden in corporate overhead and a true picture of the advantage of moving offshore is never

44. See Stephen Lewis, *Mexico: Emerging from Crisis*, MARKET LATIN AM., July 1, 1997, at 5-7.

45. See Darwent, *supra* note 4, at 68-74.

46. See Elamex and Sklair, *supra* note 36.

TABLE 2
Mexico maquiladora locations and sizes—October 1997.⁴⁶

City	Plants	Employees (000's)
Tijuana	618	145.4
Ciudad Juarez	288	197.2
Mexicali	156	45.2
La Laguna (Torreon, Gomez Palacio and Lerdo)	174	40.5
Nuevo Leon (Monterrey and Guadalupe)	112	41.2
Matamoros	111	55.1
Reynosa/Rio Bravo	104	51.1
Tecata	101	9.4
Chihuahua	77	37.9
Nogalas	77	31.5
Aguascalientes	70	18.5
Guadalajara/Zapopan	62	21.6
Ensenada	62	10.2
Yucatan	55	11.9
Ciudad Acuna	53	28.5
Nuevo Laredo	52	20.3
Guanajuato	50	11
Piedras Negras	43	13.6
Hermosillo	38	14.2
Puebla	34	13.8
San Luis Rio Colorado	31	8.9
Agua Prieta	31	10.9

seen. Typically, these hidden costs are not significant enough to negate the advantages, but should be evaluated from a corporate bottom line perspective.

A. RISK ANALYSIS.

Many projections and estimates of labor costs, exchange rates, and capital investment are utilized in financial analysis for an offshore manufacturing project. A good financial analysis includes a predicted impact on the project justification, if some of these projections and estimates are incorrect. Any change in these estimates can result in a hidden cost.

B. LOSS OF INTELLECTUAL PROPERTY.

Any firm planning offshore manufacturing must consider the risk if the product design is proprietary. Smith sees the worst possible outcomes when firms hand their core production activities to second parties.⁴⁷

47. See Jim Smith, *The Perils of Outsourcing*, ASSEMBLY, Nov. 1998, at 92.

C. TRAVEL COSTS.

Offshore manufacturing requires a significant amount of international travel and, therefore, costs that go with it (airfare, hotels, meals), as well as the loss of work efficiency for a period of time due to international travel.

D. HUMAN RESOURCE EXPENSES.

Individual U.S. workers are almost always affected when manufacturing is moved offshore. Separation packages to employees who lose their jobs due to the move are a cost often not included by firms as part of the financial justification. Once the decision to move manufacturing to Mexico is made, a company should follow elements of fair process by engaging people's input in decisions that directly affect them, explaining why decisions are made the way they are, and making clear what will be expected of employees after changes are made.⁴⁸ Costs to relocate and support parent company nationals (PCNs) in a foreign country should also be included in human resources expenses for the project.⁴⁹

E. PHONE CALLS, FAXES, AND PACKAGE DELIVERY.

These are other costs to consider when estimating true projected savings due to moving manufacturing overseas.

F. MISUNDERSTANDINGS.

Because of distance and, therefore, less person-to-person contact, and also language barriers, misunderstandings are more frequent when manufacturing overseas, which lead to extra costs in the form of scrap or lost time.

G. DELAYED SHIPMENTS.

Shipment delays such as customs or transportation problems can shut down production lines resulting in payment for idle time. Delays caused by a contract manufacturer can occur while it works on production for another key customer. This can cost product companies in sales when the product does not get to final customers on time.

H. HIGHER INVENTORY AND FREIGHT COSTS.

When manufacturing offshore, higher raw material and finished goods inventory levels may be required. This adds weeks to the throughput cycle, ties up additional capital, and costs money.⁵⁰ Additional freight costs also may be incurred to ship the product from an offshore location to a central warehouse.

48. See W. Chan Kim & Renee Mauborgne, *Fair Process: Managing the Knowledge Economy*, HARV. BUS. REV., July/Aug. 1997, at 65-75.

49. See Mary A. Gowan & Carlos Luis Gonzalez Ochoa, *Parent-Country National Selection for the Maquiladora Industry in Mexico: Results of a Pilot Study*, 10 J. MANAGERIAL ISSUES 103 (1998).

50. See J. T. DiBene, *Choosing the Country*, in SESSIONS PRESENTED AT ELECTRO/82 1140 (1982).

I. INFRASTRUCTURE AND UTILITIES.

Expensive, unreliable, or insufficient utilities can result in extra costs by requiring special equipment to condition power or treat water. Power blackouts can shut down production and result in idle workers. Banks may not have pesos, phone service can take months to fix, and public transportation bringing employees to work can simply stop running or go somewhere else.⁵¹

J. DUTIES, TARIFFS, AND TAXES.

Many costs can be hidden in complicated duties, tariffs, and taxes when manufacturing offshore. It is very important to fully understand these costs before significant investment is made. NAFTA has made this issue simpler.

K. TRUE COST OF QUALITY AND LABOR.

Poor quality costs more, whether it is manifested as scrap, rework, customer returns, recalls, warranty costs, complaints, or general customer dissatisfaction leading to foregone business.⁵² By some accounts, actual rates for Mexican labor can be ten times the labor rate due to high turnover resulting in significant training expenses.⁵³

IX. Company Survey.

A list of companies manufacturing in Mexico was created from the literature search and from shelter company information. A four-page survey on manufacturing in Mexico was developed and sent out to these companies.⁵⁴ The survey included questions on: company background, decision to move manufacturing to Mexico, product information, experience in Mexico, and staffing. Survey results can be confounded by: the questions included, the way questions are read, and the participants completing the survey. Responses to mailed surveys are also typically very low. Based on these facts, survey data was not intended to necessarily provide a significant contribution to the research. The purpose of the survey was to validate the literature search and personal experiences. Thirty-nine questionnaires were sent out to a variety of firms manufacturing products, such as biomedical devices, paper, electronics, sensors, photographic accessories, and automobile parts. Eight of them were returned filled out, two replied but were of no help, one was returned with undeliverable address, and two replied that they did not have manufacturing in Mexico. Significant personal follow-up was required to get the relatively limited response to the survey.

Despite a limited response, the company survey provided support for many observations from the literature search and personal experience. The findings agreed with the literature search and personal experiences in the following areas:

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51. See Mariah E. De Forest, *Hecho en Mexico: Tips for Success*, APPAREL INDUSTRY MAG., Sept. 1998, at 98.
 52. See James A. Welch & P. Ranganath Nayak, *Strategic Sourcing: A Progressive Approach to the Make-or-Buy Decision*, 6 ACAD. MGMT. 28 (1992).
 53. See Cherly D. Hein & Neil R. VanZante, *Maquiladoras: Should U.S. Companies Run for the Border?*, CPA J., Oct. 1991, at 14.
 54. See Survey on Moving Manufacturing to Mexico (unpublished survey on file with author).
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- (1) Employee turnover in the border area was reported to be as high as 15 percent per month, while the interior city of Guadalajara reported that it was not an issue,
- (2) All survey respondents reported labor costs as a key reason for moving manufacturing to Mexico, and
- (3) Seven of eight respondents reported the same or better productivity and quality in Mexico.

While one respondent reported initial lower productivity and quality, it moved the production in three months and improvements are expected with time.

Key information that was not found in the literature search was identified by the survey results, which indicated that a typical time frame in successfully moving manufacturing to Mexico is six to nine months. One response indicated two years, but this involved developing complete new production lines. Another response indicated three months, however, it had quality and productivity problems possibly due to a rushed scale up. Annual product volumes were in excess of 100,000 units for all except one of the survey responses. This indicates that companies tend to move stable higher volume products to offshore manufacturing locations. Finally, it was somewhat surprising to observe that three of the eight respondents indicated that their labor costs were less than 10 percent of the total manufacturing costs prior to the move. Therefore, less than a 10 percent total manufacturing cost savings will be seen due to labor cost reductions. However, in every case where the labor cost was less than 10 percent of the total cost, other reasons were listed for moving manufacturing to Mexico (closer to customers, plant forced to move due to new airport, proximity to suppliers, and existing plant). This supports the globalization of the economy theory and that, while labor cost is the main reason to move manufacturing offshore, it is not always the only reason.

X. Proposed Guidelines for Successful Move.

This section describes proposed guidelines for moving manufacturing from the United States to Mexico. It also discusses issues affecting the people involved so that they understand motivations and implications involved with the move and can critique it with knowledge rather than ignorance. The guidelines are based on various issues raised in the literature search and the feedback received from participants in the survey.

A. MOVE OFFSHORE FOR THE RIGHT REASONS.

Deciding to move manufacturing offshore should not be viewed as the solution to every cost problem. Before a move, however, a company should ask the following questions:

- (1) *Is the design manufacturable?* Do not try to reduce high costs due to bad designs with low cost labor. It will not work.
 - (2) *Is the process stable?* If the process is not stable, many problems will be encountered and savings will not meet expectations.
 - (3) *Are scrap rates under control?* Maybe more significant savings can be achieved by investing in methods to reduce scrap at the current location.
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- (4) *Is automation an option?* If the design is manufacturable, the process is stable, and the scrap rates are low, automation and low cost labor are the only options remaining to reduce manufacturing costs. Automation should be evaluated as a viable alternative to offshore manufacturing especially for products that are more standardized than customized.
- (5) *What percent of the manufacturing cost is labor?* Surprisingly, companies pursue offshore manufacturing even when their labor costs are a very low percentage of total manufacturing costs. Generally, labor costs should be 10 percent or more of the total manufacturing costs in order to justify the investment in offshore manufacturing. If labor cost is less than 10 percent, redesigning or retooling to reduce component costs is the preferred option.

B. PERFORM A FINANCIAL ANALYSIS WITH ALL HIDDEN COSTS.

Once the decision to manufacture offshore has been made, a detailed financial analysis should be performed. A preliminary financial analysis should be conducted, even before considering offshore manufacturing as a viable option. This preliminary analysis is enough to get the project started, but it is important to follow it up with a detailed analysis that includes all potential hidden costs, in order to ensure that the true impact of offshore manufacturing is known. Although these hidden costs may not be significant enough to prevent the move, if not estimated these can prevent the project from achieving expected results. However, occasionally hidden costs may be very significant, in which case the detailed financial analysis will prevent significant losses.

C. SELECT THE MOST APPROPRIATE LOCATION IN MEXICO.

Deciding where to move manufacturing in Mexico depends on the specific product being moved. However, if low cost labor is the main reason to move manufacturing to Mexico, there appears to be little advantage in moving to Tijuana, other than the proximity to San Diego. Mexico City is another location to avoid. Areas around Mexico City are far better options because firms can take advantage of the large labor pool in Mexico City yet avoid many of the problems associated with Mexico City. Evaluating the smaller border cities (Nuevo Laredo, Matamoros, and Mexicali) or the interior cities of Monterrey and Guadalajara is highly recommended.

D. SELECT THE MOST APPROPRIATE AVENUE INTO MEXICO'S MANUFACTURING INDUSTRY.

The option to enter the manufacturing industry in Mexico is dependent on company size, financial risk tolerance, product volume, previous experience in Mexico, and expected manufacturing costs. Direct ownership has the lowest cost potential, but also the highest investment risk involved. This is recommended only for companies who have experience in Mexico and can absorb potential losses. Working with a shelter company is a good option if a company has limited experience in Mexico, but wants to maintain complete control of the manufacturing process. Contract manufacturing is an excellent way to enter the Mexican manufacturing industry for the first time. It is also very appropriate for low volume or seasonal manufacturing items. Contract manufacturing

in Mexico only requires periodic visits by U.S. product company employees as opposed to relocating PCNs to work at the facility in Mexico. For this reason, a contract manufacturer in Mexico's interior region that can provide better pricing due to lower labor rates than border cities is recommended.

E. DO NOT IGNORE CULTURAL DIFFERENCES.

Cultural differences affect the way people work and do business in Mexico. The key is to recognize and understand these differences and factor them into job training and expectations. If PCNs will be working in a Mexican facility, selecting PCNs who are willing and capable of dealing with cultural differences may be one of the most important decisions a company can make with respect to the success of its Mexican operations.

F. SPEND TIME ON TECHNOLOGY TRANSFER AND TRAINING.

Transferring technology to Mexico and training the staff is probably the most important part of the success of any move from the United States to Mexico. Do not forget the years it took to develop the technology and the highly trained staff in the United States. A half-hearted effort to transfer this technology and knowledge will result in poor quality and productivity in addition to higher than expected costs. If done properly, quality and productivity can equal or exceed those obtained in the United States.

G. TAKE THE OPPORTUNITY TO IMPROVE.

How often do companies have the opportunity to start with a clean slate and set up a new manufacturing operation? Moving manufacturing from the United States to Mexico provides this opportunity. Taking advantage of this is highly recommended. Process changes can range from very simple and quick, which don't delay the move, to complete process redesign. However, any changes must be carefully planned and tested to prevent problems. Regardless of the level of change in the long run, starting with a clean slate has a hidden savings potential that can counteract the hidden costs discussed above when done properly.

XI. Conclusions.

Locating its manufacturing operations is a strategic decision for a U.S. firm. It becomes crucial, however, when the move is to Mexico, a country with vast economic, business, political, and cultural differences from the United States. The task of conducting a technical and operational feasibility to aid the decision process is made difficult by these differences, which are not always obvious and straightforward. For example, the popular myth that lower labor costs and smaller real estate investments are prevalent throughout Mexico does not hold true.

In order to sift fact from fiction, and to enable sound business location decision-making, the authors have proposed a set of guidelines that considers pertinent decision variables specific to the work environment in Mexico. These guidelines are based on

empirical business studies that the authors have participated in, as well as surveys of several companies with manufacturing operations in Mexico.

The debate over loss of U.S. manufacturing jobs will continue. However, studies have proven that while there is trade off in job displacement across industries, overall NAFTA has been good for job creation, both in the United States and Mexico. It is fair to expect that over time the maquiladora manufacturing in Mexico will advance Mexico's internal technological capabilities and bolster the economy resulting in benefits for all Mexicans.
