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Edward F. Gibney III
Lehigh University

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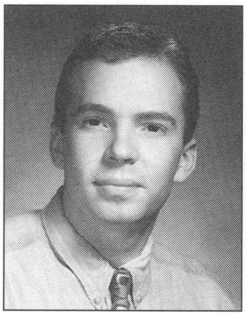

Introduction

When the United States, Mexico, and Canada signed the North American Free Trade Agreement (NAFTA) on August 12, 1992, it was notable not only because it created the largest free trade zone in the world with 350 million people and a GNP of $6 trillion (U.S. currency), but also because it was the first such agreement extended from a developed nation to a developing nation. ("When the Talks Turn To Trade," p. 1) What makes a country developed if not its ability to produce the goods and services that yield a higher standard of living for its people? The output of these goods and services depends on two things - the factors of production (capital and labor) and the technological level at which these factors of production perform. Mexico has hopes that the North American Free Trade Agreement will lead to long run increases in the standard of living of its people by increasing the rate of growth for Mexico's production of goods and services. Gary Hufbauer, an economist at the Institute for International Economics in Washington, has estimated that the removal of trade barriers by the NAFTA could sustain GNP growth in Mexico at an average annual rate of 4 to 5 percent, after inflation, over the next 25 years. (Richman, p. 95) According to macroeconomic theory, however, the only way a country can sustain a higher rate of output growth is through an increase in its level of technology. Therefore, in order for the NAFTA to help Mexico obtain its goals of a higher standard of living and a more robust economy, it must lead to a transfer of technology from Canada and the United States to Mexico. It is precisely this all-important transfer of technology that makes the NAFTA a uniquely important and interesting prospect. How will the North American Free Trade Agreement promote an increase in technology in Mexico?

Right now, Mexico is struggling to catch wealthy nations in the technological development of its telecommunications network and core infrastructure. While the road ahead in these areas looks rather difficult, Mexico has hopes that the North American Free Trade Agreement will help to speed its reform. As is discussed below, the NAFTA will aid Mexico in two distinct ways - by raising capital and by lowering costs. Capital will be raised through an increase in foreign investment brought about by a reduction in foreign ownership limitations and by Mexico becoming more attractive to potential investors. Funds will also be gathered from domestic and foreign government agencies. Costs for telecommunication equipment and infrastructure will drop according to the rate at which NAFTA lowers North American trade barriers. Therefore, NAFTA will give Mexico more money to rebuild as well and will make the rebuilding process cheaper.

Mexico's Lack Of Technology

Of the three countries entering the North American Free Trade Agreement, Mexico is certainly seen as the most impoverished, and for good reason. It is only through the liberalization of its economic policies over the past few years, that Mexico has proved itself able to "sit at the table" with Canada and the U.S. in these trade negotiations. Mexico is not a country blessed with an abundance of natural resources; and its technology level is, in general, very low. Although instances of highly sophisticated companies can be found, particularly in the petroleum industry, there are numerous examples of industries that are well behind current technology levels. Telecommunications and general infrastructure are two of the more pressing areas in need of improvement.

Telecommunications

In the United States, long distance communication over the phone is abundantly available. Virtually everyone has a telephone in his or her house. Some households even have a second line installed solely for their teenage children. In general, North America outclasses the world with its telecommunications availability. The North American market has more than one-third of the 415 million worldwide telephone access lines. ("Killen & Associates," p. 1) This continental dominance, however, is due almost entirely to U.S. and Canadian telecommunications wealth since conditions in Mexico are much poorer. Mexico has only 6 million telephone lines to serve its population of 85 million! (External Affairs and International Trade Canada, p. 1) This lack of available service does not just hinder children from calling their parents on national holidays, though. Telephone lines are used for much more than just personal calls. Businesses rely heavily on contacting people and obtaining information over the telephone. Extra time spent trying to relay information over the phone is likely to harm a company. In Mexico, most wealthy people carry cellular phones with them at all times because of this lack of over-the-wire service and the need for instant and reliable communication. Given this and the new advances in fiber optics, the government-controlled telecommunications sector has the potential for improvements of enormous proportions.

Infrastructure

Mexico is also hindered by poor infrastructure in the form of terrible roads and railways, schools that often lack windows, and Mexican homes with no running water. This nationwide deterioration took place while Mexico suffered through a ten year drought in government-funded infrastructure construction. The few roads that have been built recently have been provided by the private sector. Mexico's sparse and crumbling highway system substantially lowers the overall standard of living of its citizens. Besides the fact that personal travel is inconvenient and uncomfortable, industrial shipping costs are raised. The result is an overall rise in the price level of Mexican-produced goods. This, of course, is harmful to both domestic consumers and export-good manufacturers. The demands placed on this already poor transportation system are likely to get worse, too. Today, only one Mexican in sixteen owns a car (as compared to one in two Americans). Forecasts indicate that as the Mexican economy improves and more citizens are able to afford cars, annual car and truck sales in Mexico will rise from the 1992 level of 706,000 to over 2 million by the end of the decade. (Richman, p. 96) This increase in the number of private motorists will only serve to erode the highway system at an even faster pace. Also, commercial transportation use is likely to increase. Of the $64 billion in Mexican-U.S. trade in 1991, almost 90 percent of it went overland. (Alm, p. 1D) As the trade between the two countries increases, as is expected with or without a NAFTA, the demands on and subsequent deterioration of the border transportation system will increase as well.

The inadequacies of the Mexican infrastructure are not restricted to roadways, however. The lack of wastewater and solid waste facilities, along with lax environmental controls on the *maquiladoras* - foreign owned companies operating in Mexico for the reduced labor costs - have led the American Medical Association to damn the border region as a "virtual cesspool." (Solis, p. 3) The region contains rivers resembling open sewers, carrying toxic waste and deadly diseases. In April, 1993, seven women members of the United States Congress made a four-day trip to Mexico in an attempt to see how the NAFTA would affect the health and welfare of families along the Mexican border. After the trip, Representative Karen English said she was surprised at "the level of filth" in the border industrial parks. She went on to explain by saying, "I saw these dead animals lying in the water just yards from where barefooted children were walking on a walkway. Flies are just flying around these dead animals. The smell was horrible. We would not tolerate a smell like that." (Gamerman, p. 1) Also visited were the poor border towns, known as *colonias,* that often lack running water and electricity. The future cost of cleaning up this border region will place a heavy burden on the Mexican economy for many years. Additionally, cancer and mortality rates of the workers and their families living in this region are very high. Therefore, this infrastructure problem is not only costly to the Mexican economy, but to the lives of its people as well.

The problem of a crumbling infrastructure is not restricted to rural areas. A trip to Mexico City reveals streets that can become deeply flooded from a normal summer shower. As a result, the already overly congested city becomes backed up even more as the water and accompanying debris slow traffic and clog the streets. A stormwater management system this ineffective would be completely unacceptable in the United States for even a small town, let alone a city twice the size of New York. The problem arises from an antiquated sewer system and roads with no crowns to force the water to run off. To repair just Mexico City's major streets alone would be a massive undertaking and probably not possible in the near future.

Improving Mexico's Technology

These problems with telecommunication and infrastructure services adversely affect not just the Mexican economy, however. They also make Mexican businesses unreliable to the point of offsetting the low-wage-labor benefits that make Mexico so attractive to foreign investors. Therefore, in order to obtain the most that a NAFTA has to offer, these problems must be dealt with.

Foreign Investment

How exactly does a country improve its technology level? Mexico does not produce technology; it must import it. In other words, Mexico is in the market to buy, and a NAFTA will help to ensure that Canada and the U.S. receive much of the business. As Mexican companies look to buy high-tech capital goods to increase the quality and productivity of their factories, they will - once NAFTA drops trade barriers across the board - turn to leading American and Canadian companies for their purchases. Where will Mexico get the money to buy this technology, however? Once again, NAFTA will help provide a solution. The answer to many of Mexico's problems, and a major hope underlying the NAFTA, is that the signing of the agreement will usher in an increase in foreign direct investment. Mexico is a country on the rise. In large part this is due to beneficial government policies, like the privatization of most of its industries, that Mexico has instituted over the last five years. Because of such policies and its proximity to the U.S. market, Mexico has become very attractive among developing countries for foreign investors. The NAFTA will serve to make this climate even more agreeable. It will act as an insurance policy for the present reforms, and as an impetus for future ones. Thus, the NAFTA will serve as a harbinger of Mexico's emergence as an economic power.

Foreign Ownership Limits

One of the most important changes to come from the NAFTA will be a reduction in foreign ownership limitations. Many Mexican industries are currently subject to maximum foreign ownership limits. The oil and telecommunications industries, for example, are limited to 49 percent foreign ownership (Kessel, 1992), while the petrochemical industry is allowed only 40 percent foreign ownership. (Milla, 1992) As these restrictions are lifted, foreign investment will rise accordingly. This increased investment will provide companies with the capital needed to reinvest in production equipment. Investment by companies is needed to raise technology levels and promote growth, new jobs, innovation, and competition in North America. ("Investment and the NAFTA," p. 2) Mexican officials have estimated that the increased flow of foreign investment induced by the NAFTA would cause a one percent increase per year in economic growth. (Golden, p. 3)

Telecommunications

While the North American Free Trade Agreement will help to increase the general level of technology, how will it affect the individual case of telecommunications? The American ratification of the NAFTA, regulatory relief in the Canadian long distance market, and the privatization of the Mexican telecom structure will serve to create the largest and richest telecom market in the world in North America. ("Killen & Associates," p. 1) In the next five years, over $10 billion will be spent on telephone equipment in Mexico. Using the past as a guide suggests that Canada and the United States will provide a considerable amount of this equipment. It is a fact that the United States possesses the world's most competitive producers of telecommunications equipment. By lowering trade barriers in Mexico and hence costs to the Mexican consumer, NAFTA will help these American companies widen their lead and support even more high-wage, high-tech jobs. Many American and Canadian telecommunications companies have already done much business in Mexico, and most of this business has increased over the past few years. When the Salinas government privatized TELMEX and opened the telecommunications market to more foreign suppliers in 1990, U.S. exports jumped 50 percent in one year to $650 million. (Richman, p. 96) One Canadian company, Northern Telecom, has seen its sales to Mexico increase from $4 million in 1988 to an estimated $100 million in 1991. (External Affairs..., p. 1) Moreover, the increase in telecommunication sales is likely to continue in the future. TELMEX plans to expand and upgrade its network at a cost of $8 billion through 1995. By the year 2000, TELMEX expects to have 35 million phones wired in an all-digital network. The American company AT&T will likely supply much of the equipment for this major expansion. AT&T has won a $150 million, three-year contract to connect 54 Mexican cities and towns with over 8,300 miles of fiber-optic cable and switching equipment. AT&T will also supply TELMEX with central office switches that sell for $5 million each. Since the NAFTA will phase out Mexico's current 20 percent import tariff on telecommunications equipment over the next five years, AT&T should get a lift in sales as its final prices are reduced. Oscar Espinoza, Scientific-Atlanta's vice-president for international marketing, expects annual telecommunications industry sales in Mexico to rise by over 10 percent once the NAFTA is instituted. Similar growth should also occur in smaller markets for products such as digital pagers and cellular phones. Noe Kenig, chairman of Motorola International, a leading manufacturer of these niche-market products, expects that as tariffs on U.S.-made goods fall, the NAFTA will give him an advantage over the cutthroat competition he presently faces from Japanese rivals. (Richman, p. 97) Therefore, the reduced trade barriers in NAFTA will give Canada and the U.S. an even greater competitive advantage in providing Mexico with the technology-raising telecommunications equipment that it will buy with the added foreign investment brought by NAFTA.

Infrastructure

Finally, solutions may be addressed for strengthening Mexico's most glaring weakness, its general infrastructure. Why does a country that has shown such economic prowess over the past five years possess as weak an infrastructure as Mexico's? The answer to this can be found in the question itself. The government has, in fact, sacrificed the infrastructure for the good of the economy. All the money brought in by Mexico's recent privatization process has gone to stabilize the economy and reduce the debt. However, with the debt crisis mostly behind it now, Mexico's attention must turn to its new primary concern - the bolstering of its dilapidated infrastructure. To get ready for the integration of the American and Mexican economies under the proposed North American Free Trade Agreement, billions of dollars will have to be invested by each country to upgrade transportation systems. The work is already underway. Irwin Rubenstein, coordinator of U.S./Mexico affairs at the U.S. Department of State, has released plans for a dozen new or upgraded border crossings. Among these are a new bridge linking Pharr, Texas, with Reynosa; a rail bridge for Laredo; the rebuilding of the Americas Bridge between El Paso and Juarez; and a new crossing between Calexico and Mexicali, California. (Alm, p. 1D) Construction will soon be completed on the Puente Mezcala, a bridge (key to the Cuernavaca-Acapulco toll road) that will be Latin America's highest suspension bridge. The Mezcala may be slightly extravagant, but it is a monument to Mexico's commitment to rebuild its infrastructure. As part of that commitment, President Salinas has promised 4,000 km. of new highways before his term expires in 1994. (Millman, p. 104)

Funding For Infrastructure

All of this rebuilding is going to cost large amounts of money, though. In the United States, where the infrastructure is relatively adequate, federal funding needs for infrastructure investment related to increased commerce which the NAFTA will bring have been projected at $1 billion for California and a staggering $8 billion for Texas. ("NAFTA Would Fail...," p. 1) Henry Munoz, chairman of the Texas Transportation Commission, has said that as much as $2 billion will be needed for road and bridge work alone. (Racine, p. 24) The amounts needed to be invested in Mexico's infrastructure will likely be even more. In order for NAFTA to be a success, this money desperately needs to be raised.

Several programs and organizations have already been examined as possible sources for the capital needed to fund construction on both sides of the Mexican-American border. One such source being considered is pollution fees. As William Blackburn, vice-president of corporate environmental affairs and chief environmental counsel at Baxter Healthcare Corporation, has said, "Infrastructure such as wastewater treatment plants and incinerators need to be built in Mexico. Disposal fees, or other pollution fees could fund this development." ("NAFTA Symposium Addresses...," p. 1) Another possible source has been offered by Mexican officials who have said that money for infrastructure and environmental projects would be raised from the taxes of workers who will obtain their jobs as a result of the trade pact. Still another new program that has been discussed as a solution to the capital requirements of Mexico and the U.S. is the creation of a North American regional development bank. This NADBank would issue bonds to raise capital for infrastructure projects. The idea for a NADBank is gaining ground. The Council of Americas has commissioned a study of the need for infrastructure projects along the U.S./Mexico border. This study could provide the NADBank backers with enough ammunition to obtain support for the project from the government and the private sector. (Acworth, p. 1) There are also several organizations that have stepped forward as sources of revenue for infrastructure investment. The U.S. Agency for International Development, for example, is interested in sponsoring a joint effort with Mexico to provide the infrastructure necessary to develop environmental technologies in Mexico. (Sturm and Totten, p. 1) The World Bank also appears ready to lend a hand. Since 1988, when President Salinas took office, the World Bank has approved 30 loans to Mexico for a total of $8.8 billion (U.S. currency) - more than a third of the credit the bank has given since its founding in 1949. Over the next four years, the World Bank plans to continue to support Mexico by lending money for improvements in Mexico's infrastructure, including railroads, roads, ports, irrigation systems, electric plants, water supply and sewage disposal. (Iacub, p. 1) Also committing to support NAFTA, the Environmental Protection Agency (EPA) will spend $150 million on water-quality improvement projects. The EPA budget includes $70 million for construction at the International Wastewater Treatment Plant to treat sewage that flows from Tijuana into the U.S. at San Diego. Additionally, the budget includes a $60 million cost sharing program to improve wastewater treatment in *colonias* along the border in Texas and New Mexico. Finally the EPA has proposed $20 million for architectural work, engineering, and design for sewage treatment plants near Nogales, Arizona and Mexicali, Mexico. The funds from the Environmental Protection Agency will become available only on the conditions that the International Boundary Water Commission (IBWC) agrees to the plan and that the U.S. border state for each project area agrees to share some of the cost. On its own, the IBWC has also come forward with funds for infrastructure in Mexico and the United States. With funding received from the Department of State, the IBWC will contribute $2.52 million for a Tijuana, Mexico, sewage treatment plant and $1 million for wastewater treatment in Nuevo Laredo, Mexico. In fiscal year 1993, the IBWC has contributed $281,000 to an international water treatment plant in Nogales, a city that stretches across the border between Arizona and Mexico. ("U.S. Budget Administration Proposes...," p. 1) Finally, the now more financially stable government of Mexico has pledged a total of $460 million for the improvement of the border region - the area of Mexico that is the most deteriorated and also the most important for the NAFTA. This pledge is part of a three year plan covering the period 1992-1994, and contains a fund of $168 million earmarked specifically for transportation and roads. Much of the remaining money is to be spent on wastewater and solid waste facilities for the benefit of the border regions' precarious environment. (Secretariat of Social Development, p. 4) Also, Mexican government funding for infrastructure should increase in the future because of a generally improved NAFTA economy. The healthier economy would increase government revenue and free the policymakers to invest money in the nation's infrastructure rather than having to worry about stabilizing the economy or financing the country's debt as they have had to do in the past. These programs and organizations, along with still other possible sources, should help to cover funding of the infrastructure improvements in Mexico and the U.S. that are so vital to the success of Mexico's economy and of the North American Free Trade Agreement.

Materials For Infrastructure Rebuilding

Assuming that the necessary money is raised for this infrastructure investment, how will NAFTA aid the actual building of facilities? As far as the construction of roads is concerned, most roadways have recently been built as toll roads by Mexican engineering and construction companies. These private companies are allowed to keep revenue generated from the toll roads generally for a period of twenty years (in some places more, in some places less), whereupon they must then relinquish ownership of the roads to the government. (Kessel, 1992) The private sector has built some major roads over the last few years; but with no government incentives other than the tolls, it is feared that the private sector alone will not be able to fulfill Mexico's ambitious construction plans. One way in which the NAFTA will assist the rebuilding of Mexico is through the exportation of American high grade steel for the construction of bridges, highways, and buildings. Under the NAFTA, trade will surely increase when Mexican steel tariffs, now at 10 percent (double those of the U.S.), are reduced. (Richman, p. 96) This is vital since Mexican steel mills simply cannot produce enough of the high grade steel needed for the rebuilding of Mexico's infrastructure. ("Place Your Bets...," p. 30) Thus, just as it did for telecommunications, NAFTA will give Mexico more capital to buy even cheaper goods for its infrastructure reconstruction requirements.

Education

Once Mexico attains these relatively short term goals in the areas of telecommunications and general infrastructure needs, it will then be able to concentrate on long term solutions to its problem of a generally low level of technology. The most obvious solution will come in the form of education. Once the Mexican market is opened up to American competition with the advent of the NAFTA, the average low Mexican educational level could place the flexibility and competitiveness of Mexican industry in jeopardy. This would result in an even greater concentration of low-wage, low-skilled labor in Mexico. (CRS, p. 45) Since Mexicans desire this situation even less than the AFL-CIO, they will be forced to overhaul their educational system in the coming years. In the past, the lack of proper educational facilities and the economic need for pupils to enter the workforce early have contributed to low attendance levels nationwide. (CRS, p. 45) The majority of Mexico's labor force has only received a primary education. This is currently being dealt with by government-subsidized, industry-funded technical schools. (Kessel, 1992) Companies in the private sector are also looking to the future by opening primary schools in an attempt to educate their employees' children. Other programs being considered as part of the NAFTA negotiations between Mexico and the U.S. include international cooperation between post-secondary educational institutions, teacher exchanges, and a migrant student record transfer system. (CRS, p. 46) If put in place, these visionary programs will help to ensure a brighter future for Mexico and the North American Free Trade Agreement.

Conclusion

The North American Free Trade Agreement is being entered into with one party, namely Mexico, plagued with serious physical and financial shortcomings. Physically, much of Mexico is in a state of disrepair. Economically, Mexico is struggling to deal with these physical problems. On the bright side, though, Mexico is a country with enormous potential. It is for this reason that the United States and Canada have negotiated with Mexico in the hope that the NAFTA will ensure economic growth and reconstruction in Mexico. The rise in Mexican technology necessary for sustained economic growth will occur with the help of the increased foreign direct investment which NAFTA is expected to induce. Specifically, the areas of telecommunications and infrastructure will be helped by a combination of foreign capital for investment, and the reduced prices in North America that the NAFTA will bring.

Clearly, Mexico stands to gain a lot from the NAFTA, and could take a big step towards entering the elite group of wealthy nations. For the United States, gains will come in the form of broadbased economic growth, and in finally having a politically stable, healthy economy south of the border. (Schott, 1991) After all, a stronger Mexican economy will surely benefit the U.S. since even now 70 cents of every Mexican dollar spent on imports goes to the U.S. (Masur, p. 35) Finally, Canada will gain new opportunities in Mexico and a chance to renegotiate the Free Trade Agreement which it signed with the U.S. in 1988. Thus, the North American Free Trade Agreement should have a positive effect for all concerned.

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