AMERICAN UNIVERSITY OF BEIRUT

THE IMPACT OF TRADE OPENNESS ON THE ECONOMIC GROWTH OF MEXICO

by
LUCIE JEAN ELIAS

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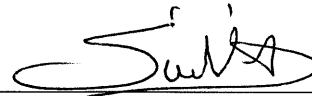at the American University of Beirut

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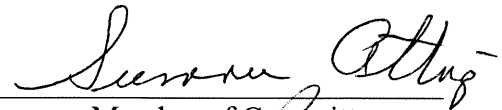
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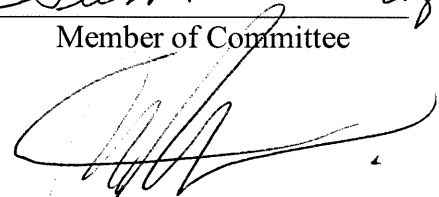Institute of Financial Economics

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AN ABSTRACT OF THE THESIS OF

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Title: The impact of trade openness on the economic growth of Mexico

International trade was proven to be of great importance to countries in boosting their economic growth. It is essential to the involvement of developed countries in the world economy. Mexico is a developing country who joined the World Trade Organization on January 1st 1995 and signed until today 13 free trade agreements with 50 countries. This thesis studies the impact of trade openness on the economic growth of Mexico. The variables used are trade openness and economic growth. Using Augmented Dickey Fuller and Philips Peron tests, we found that the variables are non-stationary at the levels, but they become stationary at the first difference. Then, we applied Johansen's cointegration test, where the variables were found to be cointegrated. A VECM model was used to study the relationship between the variables. The results show a slightly positive impact of trade openness on economic growth in Mexico. Therefore, Mexico should work on making internal reforms along with improving its exports.

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CHAPTER I

INTRODUCTION

Trade liberalization consists in removing any barriers to the free exchange of goods and services between countries. Countries will realize benefits by engaging in free trade, world production increases with countries producing more than their local needs only, which will eventually lead to economic growth and an increase in wages. The countries' performance is better under trade than without it. "Openness is an indispensable enabler of growth, job creation, and poverty reduction" (Jackson 2015). As we can see in modern history, rarely any small country was able to grow without relying on exports and trade. Trade will improve competition between the different countries which will lead to higher productivity and hence higher wages and reduction in poverty. Trade openness is giving developing countries the opportunity to participate in the global economy and be more involved that any time before. However, it is not enough to just engage in free trade agreements, countries should also work on improving their competitiveness. Benefiting from openness includes three key elements; the different fiscal, monetary, and exchange rate policies, "good governance" that implies an effective government and prompt decision-making and both hard and soft infrastructure. It is therefore essential to reinforce economic openness and domestic competition.

On the other hand, some parties are still opposed to these free trade activities. They argue that not all resources are similar and perfectly transferable between

countries, they also believe that not all markets are competitive markets which might not lead to the listed benefits from trade listed previously. Moreover, they believe that there is no concrete proof yet that this increase in growth will lead to a reduction in poverty; a study done by Rigobon and Rodrik (2005) determined a negative impact of trade on incomes. "World trade has consistently expanded more rapidly than World output" (Husain, 2007). In 2006, world trade went up by 9.2% relative to only 5.4% increase in world output. There has been a lot of studies about the relationship between trade openness and economic growth but there still isn't any single solution to the problem. Some economists believe that these free trade policies in developing countries might be giving foreign products some advantage over local production. Local industries have to decrease their prices in order to compete with foreign products. Those free trade policies are also creating environmental damage since there are no barriers on imports coming from developing countries to check whether or not the environmental standards have been respected.

During the periods before 1980, Mexico adopted a protectionist trade policy. It then decided to start adopting free trade policies in order to boost its economic growth and hence it started signing bilateral and multilateral trade agreements with different countries. Mexico became a member of the world trade organization (WTO) on January 1st 1995 and a member of the General Agreement on Tariffs and Trade (GATT) on August 24th 1986. It signed 13 free trade agreements with 50 countries including the European Union and Asia. However, the most important trade agreement is the North American Free Trade Agreement (NAFTA). NAFTA is an agreement signed by the US, Canada and Mexico to make trade between these countries easier. It is the first trade

agreement signed between a developing country and two developed countries. NAFTA intended to create a competitive trading region where the involved countries would benefit from Mexico's labor, Canada's natural resources and the technological advancements of the United States. The NAFTA area would then be able to compete with the European Union and the "Four-Tigers" which were South Korea, Taiwan, Singapore and Hong Kong and were led by Japan. For this bloc to succeed the three countries were required to apply parallel measures. It's the largest free trade agreement in the world and was implemented on January 1st 1994. The NAFTA agreement helps the involved countries to better compete with the European Union and China. It removed tariffs on the traded goods and mostly on "agriculture, textiles and automobiles", McBride and Sergie (2017). It tripled trade in the region and increased foreign investments for the three countries. NAFTA's target for Mexico was to promote economic growth and create jobs to limit the illegal migration to the United States. For the US and Canada, making such a deal with Mexico would mean increasing their companies' competitiveness since investment in the Mexican market would be at a lower cost.

This thesis is important because for the past several years, the importance of trade in the world economy has increased dramatically. World trade is growing more rapidly than the growth in world income and hence countries that participated in international trade have grown more than others who did not. Developing countries have to rely more and more on exports especially manufacturing exports. In chapter two we discuss the macroeconomic developments in the NAFTA area, and then chapter three will present the literature review on economic growth and trade openness. In

chapter four, we build our time series model to assess the impact of free trade agreement on the economic growth of Mexico to then conclude in chapter five with the main findings and some policy recommendations.

CHAPTER II

MACROECONOMIC DEVELOPMENTS IN THE NAFTA

AREA

NAFTA introduced periods of macroeconomic stability for Mexico. Kose, Meredith and Towe (2004) reviewed the effect of NAFTA on the Mexican economy. During early 1994, Mexico was facing some macroeconomic complications; the currency depreciated, the current accounts deficit broadened, output went down sharply and inflation rate increased considerably. Therefore, Mexico had to take advantage of the NAFTA agreement and economic growth and investments went back to their pre-crisis levels in 1997. In 2003, inflation was stable and reached its lowest level in 2003. Foreign direct investment (FDI) rose significantly to 54 billion dollars during the period 2000-2002. Lederman, Maloney and Serven (2003) concluded that the effect on trade flows was insignificant.

While NAFTA had some benefits to the involved parties; increase in trade ($1.1 trillion in 2016) and an increase to more than $107.8 billion in FDI in Mexico, many factors also had an effect on the growth of these countries. McBride and Sergie (2017) state that the effect of this agreement was different for each country. In the United States, GDP increased by 0.5% due to the deal. Also, the quality of the products increased while prices were falling. Exports to Mexico and Canada grew at a faster rate than the rest of the world and supporters of the deal believe that this increase in trade

flow was the reason behind the creation of many jobs. They believe that even though some jobs are lost due to this higher trade flow, they're making up for it by creating other jobs and that the competition with China has a greater impact on job losses in the US. Moreover, it is believed that up to 6 million jobs in the US were created as a result of the trade activity between the US and Mexico. On the other hand, opponents of NAFTA argue that this agreement caused job losses in the US especially in the manufacturing sector, wages sluggishness and a deeper trade deficit. Looking at Mexico, this pact had a positive influence on the productivity of the Mexican market and on consumer prices. NAFTA helped create many jobs in the manufacturing industry and Mexico's exports to the US tripled. Mexico was able to reduce the budget deficit and maintain a low inflation rate. This pact increased the dependence of Mexico on the United States but even though it was hugely affected by the 2008-2009 financial crisis, Mexico was able to boost its economy. However, the deal's promises didn't come true entirely; unemployment rose, poverty is still the same, wages increased just a little but didn't converge with the US and growth rate was lower than that of Latin America countries. NAFTA created inequalities in Mexico, with the north of country growing at a relatively higher rate than the south. In Canada, they feared that some industries were going to suffer from the pact, but it was the other way around and Canada realized the most economic improvements between the countries of the agreement. Moreover, foreign direct investments (FDI) tripled in Canada. Trade flow between the US and Canada also increased especially agricultural exports. Employment in the manufacturing sector remained solid with 4.7 million new job opportunities. However, labor productivity still hasn't converged with the US labor productivity.

The figures 2.1, 2.2 and 2.3 below show GDP growth in percentage and trade (sum of imports and exports) for the United States, Mexico and Canada.
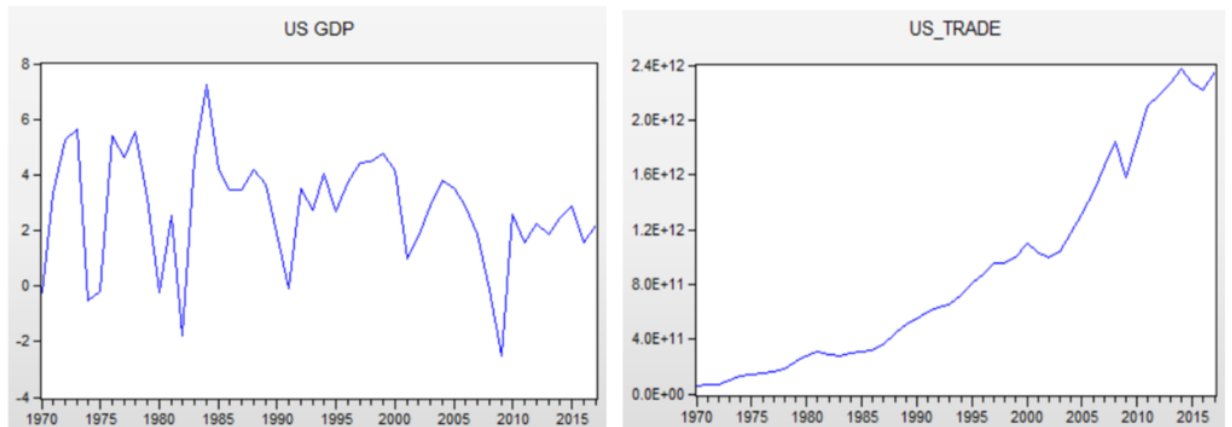
Figure 2.1: US GDP growth and trade:

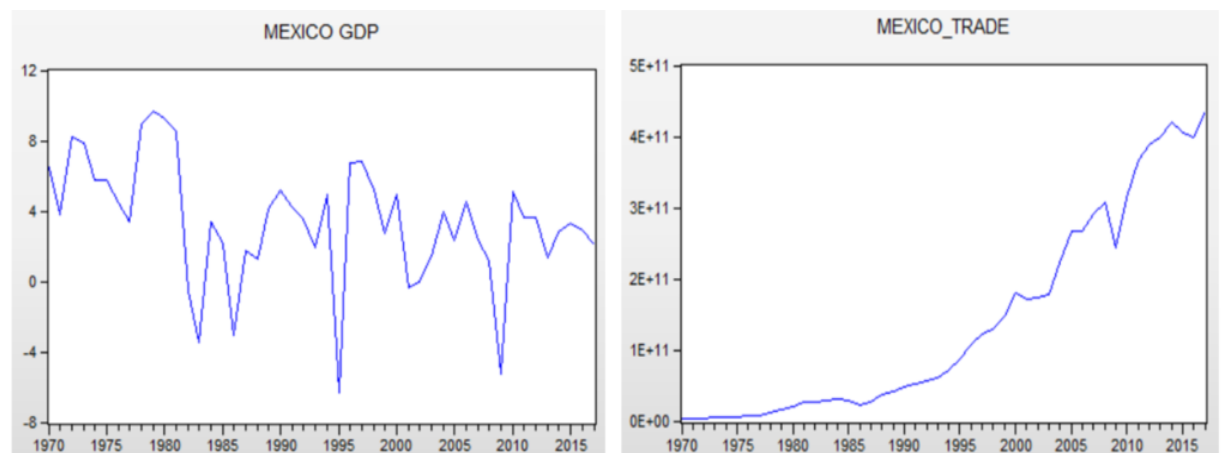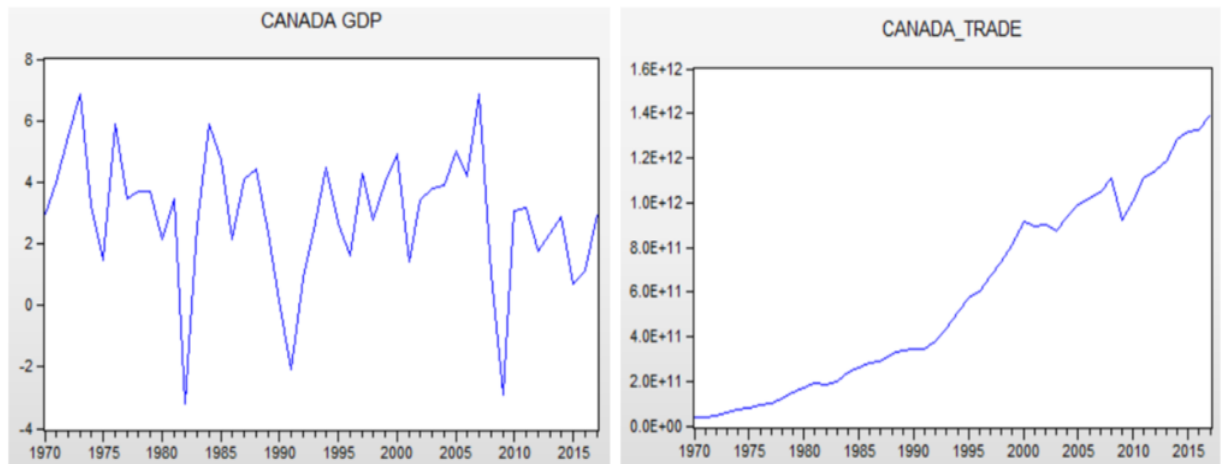**Figure 2.2: Mexico GDP growth and trade:**

Figure 2.3: Canada GDP growth and trade:

After 1994, the US economy experienced periods of expansion; this can be shown on figure 2.1 by the increase in the growth rate of GDP. Moreover, NAFTA tripled the trade between the involved parties and looking at figures 2.1, 2.2 and 2.3 we can see that after the signing of the NAFTA agreement in 1994, trade went up exponentially. Moreover, Mexico is still dependent on the US economy, after signing the NAFTA agreement and recovering from the Peso crisis, growth rate of GDP went up. However, it went down intensely during the 2008 US financial crisis. Canada also experienced periods of expansion post NAFTA and was also hugely affected by the US financial crisis.

As stated by Amadeo (2019), the impact of NAFTA can be summarized in six main pros as well as six main cons. As stated previously, the pact tripled trade between the United States, Canada and Mexico which in turn boosted economic production. Moreover, the economic growth induced by the NAFTA agreement created many jobs; 5.4 million jobs were created in the US. "Foreign Direct Investment more than tripled"

in the NAFTA area. It also helped lower prices; tariffs elimination led to a decrease in the price of oil imported from Mexico which also led to a decrease in the prices of gas and transportation costs which in turn led to a decrease in the prices of consumption goods. At last, NAFTA was able to lower prices and improve competition.

Despite the creation of millions of jobs, NAFTA was also the reason behind the loss of some manufacturing jobs. Moreover, it restricted wages since some companies were threatening to relocate and move to Mexico in order to prevent their employees from joining unions, and without those unions, workers couldn't negotiate with their employers and demand better wages. Mexican farmers were not able to compete against the subsidized prices of the US products in Mexico which resulted in them losing their jobs. Those farmers who lost their jobs started working in Maquiladora where they work near the border in US owned companies and bring together products that will be exported afterwards to the United States. Mexico's pollution worsened and deforestation rates grew as a result of the excessive use of fertilizers and other chemicals. Mexican trucks had lower safety standards than Americans'; NAFTA allowed free passage to those trucks but the Congress did not allow for this provision to become operational.

Moreover, more and more Mexicans are returning to their home country. One million Mexicans left the United States between 2009 and 2014 with a number of 11.7 million immigrants. This is mainly due to the difficulty of the United States to recover from the Great Recession and stricter immigration laws which led to many immigrants to be deported even though the majority left the US on their own. Based on an article written by Ana Gonzalez Barrera (2015), 61% of the immigrants moving back to

Mexico returned because of "family reunification" while only 14% went back to Mexico because of deportation. A survey done in 2015 in Mexico by the Pew Research Center shows that 35% of Mexican adults are still in contact with friends or family that are still living in the United States compared to 42% in 2007; 41% of those are higher income earners. However, many Mexicans (48%) still believe that those living in the States have better lives. In addition, current Mexican immigrants are older and better educated. Mexico might no longer the top source of immigrants since a huge number of immigrants is coming to the US from China and India. According to the Pew Research Center estimates there's a negative net flow of immigrants coming from Mexico to the United States.

After the election of President Donald Trump, he criticized the agreement and said that it's the reason behind the loss of US jobs and demanded a renegotiation of the deal. Some economists argue that the advantages of NAFTA outweigh its disadvantages and that it was able to limit the effect of the increasing competition with the European Union and China while other believe that the agreement needs to be ratified since many important changes took place in the world since the agreement was signed like for example the digital economy. However, regardless of these advantages, in October 2018, renegotiations between the three parties began and the new version of the deal is known as USMCA; US-Mexico-Canada Agreement. If it's ratified by the congress, it won't become operational before the year 2020. However, if not, then they go back to the previous NAFTA agreement. "We feel that NAFTA has fundamentally failed many, many Americans and needs major improvement" were the words of the United States' trade representative Robert Lighthizer during the beginning of the negotiations. With

this renegotiation, Trump intends on lowering the trade deficit (Appelbaum, 2017); Mexicans are buying from the United States less goods and services than the Americans are buying from Mexico. Even though the three parties agree on the necessity of modernizing the deal, Canada and Mexico aren't convinced with the presence of a key problem with the current deal. Mexico's minister of economy claims that balanced trade is reached through the expansion of trade and not the opposite. In the automobile industry, the Trump administration wants to impose the import of the car parts from inside the NAFTA region. Canada and Mexico seem to be opposed to the US demands regarding some substantial problems. They also realized that such changes to the agreement would require congressional support which is a little hard for Trump to get. Applebaum (2018) heavily criticized Donald Trump's attitude during deal negotiations. She described his attitude as being dramatic, filled with "insults, personal attacks, and threats to walk away". The three sides of the NAFTA agreements lost on some levels but they have also won on others. The new deal discussed some important changes but looking at the big picture, it looks pretty much the same.

CHAPTER III

LITERATURE REVIEW

Free trade policies consist of removing or reducing the commercial barriers between countries that are part of a free trade pact which leads to the free flow of labor and goods. While free trade policies might be a great success to developed countries, people are still arguing whether or not these agreements are beneficial to developing countries. Those in favor of these free trade policies believe that participating in such agreements helps the country develop even more and leads to an increase in GDP and social welfare. Critics on the other hand believe that such agreements benefit developed countries and give their products some advantage compared to their trading partners'.

Villarreal (2017) reviewed Mexico's free trade agreements and the motives behind them. He also looked at the effects of the NAFTA agreement. Up until Mexico's debt crisis, they were adopting a protectionist trade policy. However, since the 1980's, Mexico started negotiating bilateral and multilateral trade agreements with different countries. The NAFTA agreement between Mexico, Canada and the United States was signed on December 17, 1992 but it was put in effect starting January 1st 1994. Its exports increased by 515% during the period between 1994 and 2016, imports also increased by 388%. The trade balance experienced periods of surpluses but since 1998 it has been in deficit. The great dependence of Mexico on the United States was the main motive for engaging in other free trade agreements with the European Union and Asia. Moreover, due to this dependence, any economic event in the United States will have

repercussions on the Mexican economy as well; there has been a decline in the economic performance in Mexico during the 2009 financial crisis, also the Peso experienced depreciation after the election of President Donald Trump in 2016.

Alamro (2018) studied the effect of trade openness on the economic growth, productivity and unemployment in Jordan. After the singing of several trade agreements, Jordan's exports switched from primary to manufactured exports. He used a VECM model (Vector error correlation model). According to his study developing countries with no structural development plan tend to gain less from trade openness. He used time series data for the period 1980 to 2014; he calculated trade openness by using an index which was the sum of exports and imports divided by the real GDP. He also included unemployment rate and labor productivity. He tested for unit root by using the ADF (Augmented Dickey Fuller) approach. The variables were non stationary and they were found to be of order I(1) with one cointegration equation. He also used impulse response functions along with the forecast error variance decomposition. After estimating the VECM model, he found out that trade openness, labor productivity and unemployment have a positive and significant effect on the economic growth which was calculated as the Real GDP per capita. However, in the short run the relationship between the variables is insignificant. Even though trade openness had a significant impact on the growth rate of Jordan it still suffers from trade deficits.

On the other hand, NAFTA didn't increase Mexico's growth rate the way politicians said it would. In their paper, Weisbrot, Lefebvre and Sammut (2014) looked at the performance of the Mexican economy before and after the signing of the NAFTA

agreement and also in comparison to Latin America in general. Mexico is ranked 18 out of 20 Latin America countries in terms of growth rate. Real GDP in the period prior to 1980's doubled while after 1994 it only increased by 18.6%. If the trend before the 1980's continued, Mexico would have been a high-income country today. The growth rate of Latin America during the same period was almost as double as the one achieved by Mexico. Poverty and wages remained the same while the rest of Latin America experienced decreases in the poverty rate. Unemployment also increased and the bad economic performance led to more migration to the United States. Moreover, NAFTA is not the only factor to blame for the bad economic performance in Mexico; it is in a competition with China in the US Market. China has also an advantage since their exchange rate is fixed against the dollar. The dependence on the US increased even more, any crisis that happened in the US had an impact on Mexico. The Peso crisis of 1994-1995 was a result of the increasing interest rates by the US Federal Reserve Bank. Mexico's growth rate has decreased by 6.7% during the 2008 US financial crisis. Mexico signed these free trade agreements in order to have an economic performance better than the one achieved with the protectionist trade policy. However, the result was declines in the economic performance. In 2017, Weisbrot, Merling, Mello, Lefebvre and Sammut updated their findings on the repercussions of NAFTA on Mexico after 23 years of signing the deal. In terms of the real Gross Domestic Product per capita, Mexico is 15th out of 20 Latin American countries. Mexico's GDP per person (1% per year) was drastically lower than the annual growth rate of 1.4% generated by the entirety of Latin America. Unemployment reached a level of 3.8% with 4.9 million famer jobs lost.

Sachs and Warner (1995) studied the relationship between trade openness and economic growth by using a dummy variable to specify if the country is open or not and they found a positive and significant impact of trade on economic growth. Nina Pavcnik (2009) considers that developing countries have benefited from abandoning protectionism in favor of free trade; even though gains are not equal, countries who have adopted free trade policies tend to grow faster than others and have higher standards of living. Manni and Afzal (2012) also studied the impact of trade liberalization on the economic growth in developing countries, specifically in Bangladesh and concluded that trade openness had a significant effect on imports and exports which affected growth rate positively. Haussmann, Hwang and Rodrik (2007) found out that countries with "low quality products" will be affected negatively by international trade.

Thailand signed a free trade agreement with Australia and an economic partnership with New Zealand. And even though these agreements are signed between a developing country and two developed countries, Thailand's economy benefited from the deal. Chiasakul, Khanti-Akom and Wittayarungtuangsri (2010) studied the economic influence of TAFTA and TNZCEP on the Thai economy. TAFTA is the Thailand-Australia Free Trade Agreement. It was signed on July 5th 2004 and became operational on January 1st 2005. Its objective is to eliminate tariffs to freely exchange goods, services and investment. Within 2005, tariffs on 83% of the goods imported from Thailand were removed while 50% of the tariffs on Australian imports were removed. Also, Thailand eliminated some of the tariff quotas. They also started applying some Safeguard Measures in dealing with the trade of agricultural products.

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More efforts are being put into "custom procedures, anti-dumping measures, electronic commerce, intellectual property and competition policy." TNZCEP is the Thailand and New Zealand Closer Economic Partnership. It was signed on April 19th 2005 and became operational on July 1st 2005. Its objectives are the same as the ones under TAFTA. 79% of the tariffs imposed on the goods imported from Thailand were eliminated while tariffs on 54% of the goods imported from New Zealand were eliminated. Thailand also removed tariff quotas and agreed with New Zealand on some Safeguard Measures while trading in agricultural products. They ran a computable general equilibrium model. While this model has some limitations, it is one of the widely used models to study the influence of free trade agreements. They use a GTAP 7 database and divide the world into four regions; Thailand, New Zealand, Australia and the rest of the world. Production is distributed between 21 sectors; 10 are goods and 11 are services. There are also 5 factors of production: land, non-skilled and skilled labor, capital and natural resources. The goods tariffs are set to zero. However, for trade in services they set four different scenarios depending on the reduction of trade barriers (0%, 20%, 40% and 100%). Trade barriers are measured using the "Trade Restrictiveness Index" which is a number between 0 and 1. A higher number means trade barriers are higher. This index is higher for Thailand than it is for Australia and New Zealand. The results under the four different scenarios indicate that TAFTA and TNZCEP benefited the Thai economy but each with different magnitude. The elimination of all trade barriers in the services sector proved to be the most beneficial for Thailand. While looking at the different economic variables including "social

welfare, GDP, sectoral outputs and exports and imports" the free trade agreements had a positive impact.

Weisbrot, Rosnick and Baker (2004) explain how the World Bank studies the effect of NAFTA on the economic growth of Mexico and how they got to the conclusion that NAFTA led to an increase in Mexico's growth rate. The first study made by the World Bank shows that NAFTA increased Mexican's growth rate by almost 0.5 to 0.7%. The revised study done afterwards shows the same effect but with less magnitude. The authors show that the effect can't be positive since the data on growth shows a bad performance of the Mexican economy in the post NAFTA period. Prior to 1994, growth rate exceeded 4% and in certain years 7%. But after the singing of the deal, growth rate averaged around 1.8% which means that it's not possible for NAFTA to have a positive impact on the Mexican economy which is odd since developing countries tend to grow at a higher rate than already developed countries which was the case for South Korea and China. They regressed a simple model: $G_{t/t-1} = \propto + \beta \times NAFTA_t$ Where G is growth in the per capita PPP GDP and NAFTA is a dummy variable indicating the period post 1994. The results are not significant and lack many other factors affecting growth but they show a negative effect of NAFTA. Then they show how the World Bank regressed their model and how they got their results. The World Bank used as its dependent variable the ratio of per capita GDP in Mexico to the per capita GDP in the United States. But the main issue is how they constructed this ratio using the Mexican Pesos. They can either use the exchange rate to convert pesos to dollars or use PPP measures; but they used the most appropriate measure which is the PPP measures. However, using this method will enable real

growth rate movements to be dominated by the real exchange rate movements. The measures and methodology used by the World Bank led to a bias in the results and to finding that NAFTA had a positive impact on the growth rate of Mexico and any correction to both versions of the World Bank's model will show that NAFTA won't lead to a greater growth rate.

To speed up the necessary structural reforms, developing countries should use regional and bilateral free trade agreements. This result is shown by Kose, Meredith and Towe (2004) who studied the effect of NAFTA on Mexico's business cycles and growth rate. The main advantage behind this agreement was inducing a significant increase in NAFTA partner's trade and financial flows. They argue that it is difficult to isolate the effect of NAFTA on Mexico's economic performance since many factors had also important economic repercussions. Other factors that had an implication on Mexico's economic performance were: the depreciation of the Peso that happened due to the Tequila crisis in 1994, the different free trade agreements signed by the member countries and the global business cycles. NAFTA led to an increase in trade between the three countries and it also affected the nature of the goods that were exported. Moreover, the flow of Foreign Direct Investments (FDI) to Mexico improved. Mexico is in an increasing competition with Asia and the rest of Latin America, and its experience demonstrates that structural reforms are crucial for countries to benefit from the gains of free trade agreements. There's a great amount of literature that show that trade openness and free trade agreements have a positive impact on growth rate while recent empirical results show that it has no effect whatsoever. Moreover, numerous research suggests that NAFTA contributed in increasing commercial and financial flows

and increasing FDI into the country by lowering Mexico's risk profile. Investment and exports constituted a bigger share of the gross domestic product and both output and investment volatilities decreased by 30 and 40 percent respectively. However, Mexico wasn't able to sustain these benefits, and growth rates were decreasing for the past years which leads back to the main conclusion that structural and tax reforms are needed to help sustain the benefits of any trade agreement.

NAFTA didn't achieve all its desired and promised goals. It was promised that the Mexican and United States per capita incomes will converge and that soon enough Mexicans will return to their home country since they can get jobs at higher wages while increasing employment in the US industrial sector. However, wages in Mexico remained the same, labor productivity was still less than the US and inequality deepened. Blecker (2014) realizes that one cannot blame NAFTA for the discrepancies that happened in Mexico but we still can't see that this trade agreement was able to converge the US and Mexican economies even after the crisis. This is shown by a stagnating income per capita and a lower productivity than the one achieved pre-NAFTA. Multinational companies were still encouraged to locate in Mexico where they can benefit from lower costs of production and Mexican workers were sill motivated into moving to the United States. The US and Mexico's industries were correlated more and more after NAFTA with a correlation coefficient of 0.83 between the periods 1997 to 2013 and hence the conclusion that the dynamism of the Mexican industrial sector comes mainly from the U.S. industry sector. This wasn't all good news for Mexico especially after the financial crisis and China's entry to the market where a drop in the United States' industrial growth led to a downturn in the Mexican industrial sector as

well. Moreover, the increase in manufacturing jobs in Mexico is less than the increase in its labor force. The United States experienced decreases in manufacturing employment; however this is not solely due to NAFTA but many factors including China joining the World Trade Organization and the 2008-2009 financial crisis.

As of 2007, Japan had signed 3 free trade agreements with Singapore, Mexico and Malaysia. In his paper, Abe (2007) studies the economic effect of Japan's free trade agreements using a "computable equilibrium model" and deals with both, Japan's bilateral free trade agreements and regional FTAs. Any tariff reduction will have impacts on welfare, production and imports and exports. He divides the effect on welfare into six different repercussions out of which only three are relevant to the model; the output, scale and variety effects. Moreover, he assumes constant returns to scale and that any welfare changes induced by a decrease in tariffs will be caused by only the terms of trade and volume effects. Even though free trade agreements are not limited to tariff reduction only and can lead to more liberalization if foreign direct investment and reduce even non-tariff obstacles to trade, Abe limited his model to tariff reduction. The author regresses a computable general equilibrium model and uses a comparative advantage theory to explain the gains from any free trade agreement. Countries with comparative advantage in one product will produce it and trade it for another good which another country has a comparative advantage in which will eventually lead to higher welfare gains. The advantage of this CGE model is that it can assess the effect of free trade agreements not only on a certain sector but also on the country as a whole and even on the world. Moreover they use "the Baldwin accumulation specification" by regressing a GTAP model (Global Trade Analysis

Project) with a finite fixed elasticity of substitution. He studies the reaction of the model's variables to an external shock (decrease and removal of tariffs). For Singapore, no major change in tariffs is noted since their rate of tariffs is zero. Mexico and Malaysia will proceed to remove all tariffs while Japan will reduce the amount of tariffs significantly on only 2 sectors; textiles and apparel and leather. Moreover, simulations to the CGE model will impact two aspects of the economy: the real GDP and EV (equivalence variation). While members of the free trade agreements will benefit in both aspects, Mexico and Malaysia will end up gaining more in terms of real gross domestic product than Japan and Singapore. In terms of equivalence variation, free trade agreements will lead to an increase in the world's welfare. Looking at the industrial sector, Japan's gains were minor and less than 0.5%, Mexico on the other hand recorded benefits in all the industrial sectors. Despite some limitations; assuming constant returns to scale and considering only the effect of tariff decrease, the author reached four main conclusions: 1) bilateral free trade agreements are necessary for Japan to gain the most benefits, 2) greater gross domestic product will be achieved by Japan and its trading partners with the early signing of free trade agreements, 3) regional FTAs will induce gains in welfare to all the region and 4) the extension of the regional FTAs will reduce losses for "non-member" countries.

In order to improve economic growth, governments depend on different policies including trade liberalization and reducing any tariffs that may constitute a barrier to trade. Tanzania was one of the countries to adopt trade liberalization. Trade liberalization came as a result of a very poor economic performance in the 1980's, however it failed to realize its goals (Herath, 2010). Mkubwa, Mtengwa and Babiker

(2014) studied the impact of trade liberalization on the economic growth in Tanzania. They believe that reducing trade barriers will increase imports and exports which in turn increase gross domestic product. Hence, their null hypothesis is that trade openness has a positive effect on the economic growth of Tanzania. They gather time series annual data on economic growth and trade openness. Their data covers the period from 1970 to 2010. They split their sample into two sub-samples; one covers the closed economy period (1970-1985) and the other covers the open economy period (1986-2010). Their dependent variable is real GDP, while their independent variable is trade openness which is measured as the sum of imports and exports divided by the real GDP. The regressed equation is: $LnGDP_t = \beta_0 + \beta_1 LnOPEN_t + \varepsilon_t$ .They run this equation for each sub-sample using the Ordinary Least Square technique (OLS). During the closed economy period, a one percent increase in trade openness will lead to a 0.36 percent increase in real GDP. Moreover, in the case of open economy, trade openness led to a 0.25 percent increase in real GDP. Both results are found to be significant. The magnitude of this positive impact was greater in the case of a closed economy, this is mainly because of Tanzania's trade deficit. Therefore, in order to benefit the most from the removal of trade barriers, Tanzania should improve its exports along with better reforms to attract more investors into the country.

In a Rapid Evidence Assessment done in 2015, the authors deal with two main issues: the impact of free trade agreements signed between developed and developing countries on the economic growth of developing countries and how can developing countries benefit from the newly signed free trade agreements or prevent their harm. They base their study on 45 signed FTAs which include 35 of the developing countries.

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Most agreements are signed between North-South countries, however there isn't any fundamental disparity between North-South and South-South signed deal. To assess the impact of any free trade agreement many factors should be taken into consideration including the characteristics of an FTA, the rules of trade and the ability of supply to respond to a quick increase in demand. Stevens, Irfan, Massa, and Kennan (2015) concluded that one cannot reach a unique conclusion about the effect of free trade agreements. This is due to the lack of studies done after the singing of free trade agreements. Moreover, most of the studies conducted give little interest to the details of the FTA (which goods are affected more than the other), the RoO (rules of trade) and the policy changes. Therefore, maximizing the benefits of free trade agreements depends heavily on the government's policies, the economic flexibility and the ability of supply to respond to a quick increase in demand. Hence, how to maximize the benefits of FTAs and reduce their harms is still ambiguous.

Since the 1990's, Jordan has been working seriously to improve its trading position by signing different free trade agreements with the United States and the European Union and by becoming a member in the World Trade Organization. Busse and Gröning (2012) used a long time series model in order to assess the impact of trade liberalization on Jordan's exports and imports. They covered most of Jordan's trading partners and chose 137 countries. They adopted a gravity-type model that has low risk of econometric problems like vulnerabilities and robustness of the results. A poisson regression was used to reduce heteroscedasticity and reduce the effect of observations with large variances. They regressed Jordan's trade which is the imports or exports on the trading country's GDP, Jordan's GDP, its WTO membership, in addition to two

other dummy variables; one for years and the other for the country-pair fixed effects. They found that these trade agreements haven't enormously boosted Jordan's exports except in the case of the free trade agreements signed with the US. Imports on the other hand have increased from Jordan's trading partners. They concluded that such free trade agreements and joining the WTO could have different effects on the country's trade. They believe that some supply side constraints may be the reason why Jordan didn't take full advantage of these agreements, but they can still have some economic benefits even if gains from trade aren't that increasing in the short-run.

Francois, McQueen and Wignaraja (2005) studied the structure and economic consequences of the free trade agreements signed between the European Union and some developing countries like South Africa, Mexico, Chile, Turkey and Egypt. They use a "global general equilibrium model" in order to assess the impact of FTAs. This model covers the world's production and trade, and shows the effect of medium and long-run investments and include inter-sectoral linkages. The data is divided into 24 sectors and 30 regions. They modified the GTAP model and added "savings-investment linkages". These agreements led to a very small increase in the developing countries' exports to the European Union. By studying the structure of these FTAs they found that the EU is gaining more than its trading partners and were led to the conclusion that the restrictions imposed by the European Union are preventing developing countries from achieving potential gains from this trade liberalization. The only trade agreements with deeper commitments are those made with Mexico, Chile and Turkey.

Moreover, Lee, Ricci and Rigobon (2004) also studied the effect of trade openness on economic growth using the "Identification using heteroscedasticity" IH technique which consists basically on moving the variance instead of the means. The authors believe that the standard methods for computing trade openness are strictly related to income levels and hence related to economic growth and regressing growth on trade openness will create the issue of endogeneity. In addition, heteroskedasticity is high along the model, therefore they will be able the IH methodology to solve the endogeneity problem and estimate the effect of openness on economic growth. However, if openness and growth were cointegrated, then their results wouldn't be biased and they wouldn't have to deal with the endogeneity problem. They use panel data for 100 countries over 8 periods of 5 years each. To represent the degree of openness they use 4 variables: "the size of trade, the tariff indicator, the import duties and the black market premium." They begin by regressing growth and trade openness on some control variables in order to better control for the endogeneity problem, then they move to the derivation of the OLS bounds and then they finally apply the identification using heteroskedasticity method. Their results show a positive impact of openness on growth, however the coefficients are smaller than the OLS estimates.

Towhid and Kurokawa (2019) also studied the implication of free trade agreements of economic growth but with a special interest in the BIMSTEC countries. These countries are: "Bangladesh, India, Myanmar, Sri Lanka, Thailand, Nepal and Bhutan. They run a Fixed Effects regression using a cross-country panel data for the period 1991-2016 for all the World Bank's member states. The share of trade relative to GDP and growth rate per capita have grown since the 1990's. However, post 2011 these

indicators started following a downward trend. Looking at the BIMSTEC countries trends, we can see that since 2010, the share of trade has been growing whereas GDP per capita was going down. They regress GDP per capita on trade openness and on a number of control variables including education, terms of trade and foreign direct investments relative to GDP. They find that it's hard to isolate the effect of openness on economic growth from other explanatory variables, openness has a positive and significant impact on growth globally but this result is insignificant when looking at the BIMSTEC countries. Education coefficient is positive and significant on the global level, and negative and insignificant for the other groups including the BIMSTEC countries. Terms of trade coefficient was found to be significant for Latin America and insignificant for BIMSTEC. As for the FDI as a percentage of GDP, the coefficient is positive and significant for BIMSTEC countries except India and Thailand, for developed countries FDIs are insignificant. They concluded that for trade to be beneficial for the BIMSTEC countries, some internal reforms inside each country should be made and cautious negotiations should be undertaken before the signing of any free trade agreement. Moreover technical education is crucial for the development of these countries.

It is well known that the main objective of countries is to achieve high standards of living. To be able to achieve this objective it is necessary to ensure a high GDP per capita over the years. Many believe that engaging in international trade and globalization will help countries achieve higher growth rates. However, it is still uncertain how trade openness affects growth, Andersen and Babula (2009) review empirical studies on the relationship between economic growth and trade openness as

well as between openness and productivity growth. Countries will usually specialize in the production and export of goods in which they have a comparative advantage in which benefits the consumers in two ways: more variety of good available and lower prices since competition will push the prices downwards. The main issue with studying the link between openness and growth has been with the measures of growth; the endogeneity problem will lead to biased and unreliable OLS estimates and other methods of estimating openness have been proven to have some limitations. Studies have mostly found a positive relation between trade and growth but the accuracy of these results remains questionable especially when looking at how robust these results are, the failure of taking into account the endogeneity problem and the many variables that affect growth. Moreover, productivity growth is one important source of the GDP per capita growth. The authors mention three main networks through which higher productivity can be achieved. In conclusion, trade impacts growth positively however it is still ambiguous if trade induce growth or the other way around, and it is still unsure if developed countries will benefit from productivity growth as much as developing countries do. Hence, it is important before liberalizing trade to ensure other complementary policies inside the country.

CHAPTER IV

METHODOLOGY

The data covers the period from 1970 until 2017. Real GDP is taken from St. Louis Fed website (FRED) and is expressed in millions of US dollars. Exports and imports are extracted from the World Bank data and are expressed in current US dollars. The variables that will be used in the model are the log of real GDP to express growth rate of Mexico and trade openness which is the sum of exports and imports divided by real GDP.

Before regressing the model, we should start by studying the variable's order of integration. We use both the Augmented Dickey fuller (ADF) and the Philips Peron (PP) tests where we use the Schwert's criterion to determine the number of lags p to be used ($p = 12 * (\frac{T}{100})^{0.25}$).

If the variables are of order I (1), we should move to checking if there is cointegration between variables since it usually occurs between non-stationary variables. We will test for cointegration using Johansen's approach. If our variables are found to be cointegrated a VECM model shall be used. If not, then our model will be estimated using a VAR model. VAR models have a great ability to forecast, however they're not based on any theoretical background. A VECM model on the other hand does better in forecasting the short and long term relationships between variables. After estimating the model we will use the Cholesky decomposition to shock a certain variable and look at how it will react to this shock and for how long. We then test for Granger causality

using the Wald test. If a certain variable causes another variable then this would make it easier to predict the value of the latter. Finally, we test for the stability of the model.

First, we begin by testing for unit root presence in the variables. To do so, we begin by using the Augmented Dickey Fuller (ADF) test for the level and first difference, where the null hypothesis is that the variables have unit root, for three models; the first model includes only a constant, the second includes an intercept and the third model includes both a trend and an intercept. We then proceed to test for stationarity using Philips Peron (PP) methodology and we follow all the steps that were applied for the ADF test. The results of both tests are shown in the tables 4.1 and 4.2.

Table 4.1: ADF Test Results

Time series variable	p-value of the ADF test at Level			p-value of the ADF test at First Difference		
	None	Intercept	Trend and Intercept	None	Intercept	Trend and Intercept
LRGDP	100	6.87	20.41	0.11	0.01	0.02
TO	99.59	98.02	41.56	0	0	0

Table 4.2: PP Test Results

Time series variable	p-value of the PP test at Level			p-value of the PP test at First Difference		
	None	**Intercept**	**Trend and Intercept**	**None**	**Intercept**	**Trend and Intercept**
LRGDP	100	9.22	20.61	0.16	0.01	0.02
TO	99.66	9827	41.56	0	0	0

Based on the results of the ADF test, we can see that the variables are non-stationary at the levels, and stationary at first differences. For a model with only a constant, the p-values for LRGDP and TO are 100 and 99.59 percent respectively. Hence, at the 5% significance level we do not reject the null hypothesis and our variables are non-stationary. Moreover, for the models with intercept and a trend and intercept we also come to the conclusion that our variables are non-stationary since we fail to reject the null hypothesis of unit root (p-values are greater than 5%). At the first difference, we can see that p-value for all three models is almost 0%. Therefore, we reject the null hypothesis of unit root and we can conclude that our variables are now stationary. Hence LRGDP and TO are found to be I (1).

Looking at the results of the Philips Peron test, we get the same conclusion that both of our variables are of order I (1). For the levels, the model with only a constant yielded p-values of 100% for LRGDP and 99.66% for TO. Hence at the 5% significance level we

failed to reject the hypothesis and our variables are non-stationary. The same applies for the two other models. On the other hand, when we move to first differences, we can see that the p-values are almost zeros which means that the variables are stationary and of order I (1).

After testing for stationarity, we then move to cointegration test which occurs between non stationary variables. We used Johansen's approach where we summarized all five models to find that we have at least one cointegrated equation. Table 4.3 below shows the results of the Johansen cointegration test.

Table 4.3: Johansen's Cointegration test

Data Trend:	None	None	Linear	Linear	Quadratic
Test Type	No Intercept	Intercept	Intercept	Intercept	Intercept
	No Trend	No Trend	No Trend	Trend	Trend
Trace	1	1	1	1	2
Max-Eig	1	1	1	0	0

Since our variables are found to be cointegrated, a VECM model is to be estimated based on Alamro's paper on the economic effect of trade liberalization on Jordan and using the following equation:

$$\Delta y_t = \alpha + \beta y_{t-1} + \sum_{i=1}^{p-1} \gamma_i \, \Delta y_{t-i} + \varepsilon_t \qquad (1)$$

"Where Δ is the differencing, α and β are $k \times r$ matrices; γ_i is a k × k matrix, and y: The variable matrices" (trade openness TO, and real gross domestic product

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RGDP) and εt represents the error term. After estimating the VECM model with one cointegration equation, we obtain the following results:

$$LRGDP = 0.0886LRGDP_{-1} + 4.64 * 10^{-9}TO_{-1} + 0.29 \qquad (2)$$

$$(0.02936) \qquad (2.5*10^{-7}) \qquad (0.0066)$$

We can conclude from the following result that trade openness has a positive but a very slight impact on the growth rate in Mexico. This increase in growth rate induced by trade openness is almost 0%. We then move to study the ability of the model to forecast by using Impulse Response Functions (IRF). Figure 4.1 shows the results of a certain shock on the variables in question. IRF will basically show how our variables (LRGDP and TO) will respond to each other.

**Figure 4.1: Impulse Response Function:**
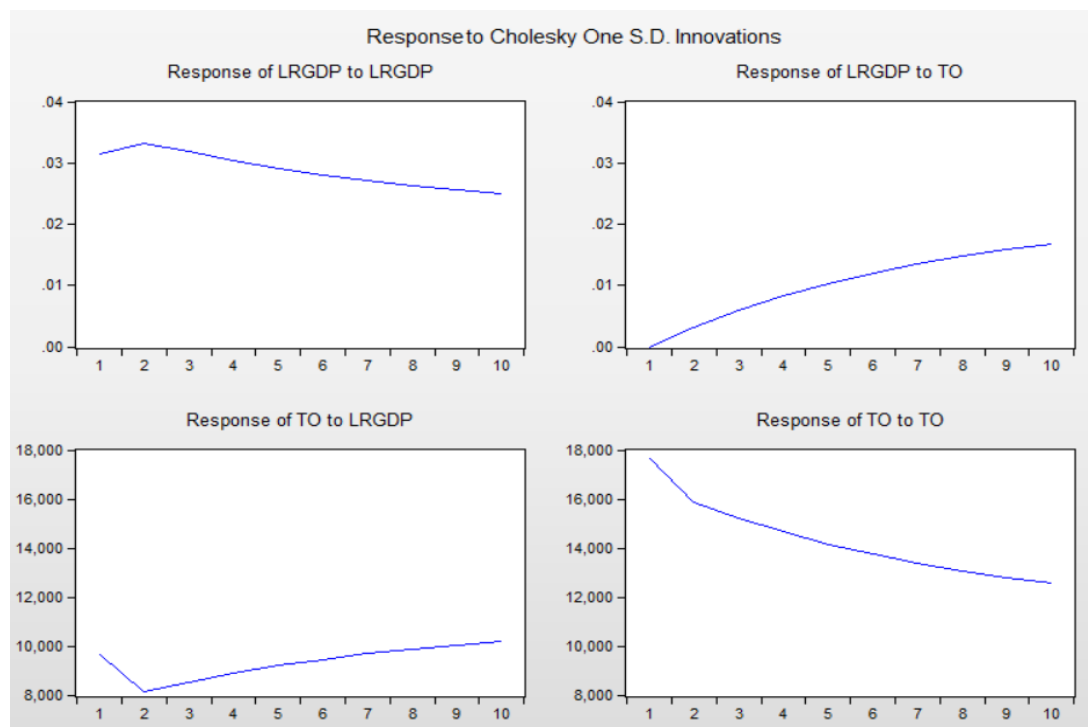
After observing Figure 4.1, we can realize that a positive shock in trade openness leads

to high increases in the LRGDP. However, trade openness reacts negatively to a

positive shock in LRGDP at first but after two periods this response become positive.

We will also test if trade openness granger causes economic growth and if economic

growth granger causes trade openness. Looking at the results of the Wald test in figure

4.2, we can see that the probabilities are 98.54% and 69.92%, hence we do not reject the

null hypothesis and we do not have Granger causality. Moreover, when testing for

stability, we notice that none of the points are outside the circle which means that our

VECM model is stable with valid results.

Figure 4.2: Granger Causality

VEC Granger Causality/Block Exogeneity Wald Tests
Date: 01/02/20   Time: 16:42
Sample: 1970 2017
Included observations: 46

Dependent variable: D(LRGDP)

Excluded	Chi-sq	df	Prob.
D(TO)	0.000337	1	0.9854
All	0.000337	1	0.9854

Dependent variable: D(TO)

Excluded	Chi-sq	df	Prob.
D(LRGDP)	0.149341	1	0.6992
All	0.149341	1	0.6992

Figure 4. 3: Inverse Roots of AR Characteristic Polynomial

Inverse Roots of AR Characteristic Polynomial
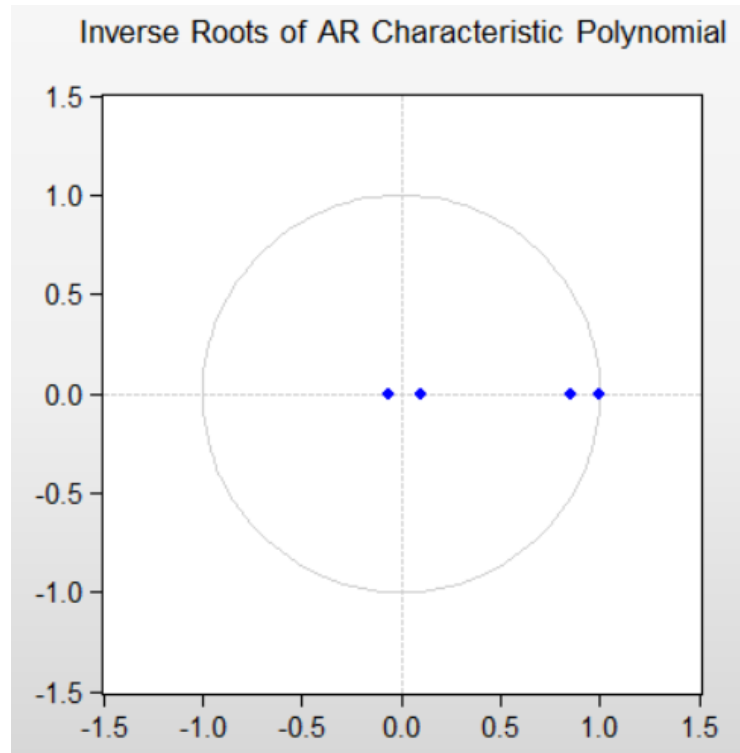
CHAPTER V

CONCLUSION

Mexico has been working hard for the past 25 years on international trade and improving its economic performance through the many free trade agreements it had signed with different countries. The most important agreement is the North American Free Trade Agreement (NAFTA) which is now known as the US-Mexico-Canada Agreement (USMCA) after the renegotiations of the deal took place. NAFTA was able to triple trade between the involved parties, it increased FDI in Mexico significantly and ensured stability in investment. The literature on the effect on trade openness on the Mexican economy is contradicting. In this thesis, we studied the impact of free trade agreement on the growth rate of Mexico using a time series model. We collected data on Real GDP, exports and imports for the period 1970 to 2017 and regressed the equation of growth rate on trade openness. Trade openness was calculated by the sum of imports and exports divided by the real GDP and the log of real GDP was used to represent growth rate. After applying both the ADF and PP tests, we found that the variables are of order I (1), we then used to Johansen's approach and found out that our variables are cointegrated which requires us in this case to estimate our equation using a VECM model. The results show that trade openness has a slight and positive impact on growth rate in Mexico. As a result, policymakers should work on improving the export side of trade in order to benefit mostly from trade. They should focus on manufacturing exports

and on internal reforms inside the country including "labor market rigidities" and tax reforms.

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