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Master Thesis

"Revitalizing Trade Dependencies: Analyzing the Influence of the 2018 Mexican Government Transition on Economic Patterns using a Gravity Model and Sector-Specific Indicators"

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ABSTRACT

This research paper investigates Mexico's relationship of political shifts and trade dynamics, focusing on the period of Morena's governance from 2018 until the present. By employing a Gravity Model and sector-specific trade indicators, this study tries to explore this relationship comprehensively. Utilizing a dataset of 200 million observations on trade flows between Mexico and other countries spanning from 1995 to 2021, the Gravity Model findings reveal a decrease in bilateral trade during Morena's governance, emphasizing the substantial influence of political factors on trade dynamics. Moreover, sector-specific analyses reveal distinct trade patterns across various sectors of the economy. These results suggest that political changes, in conjunction with economic and sectoral factors, significantly shape trade trends. However, the complex interplay of these variables underscores the need for comprehensive analysis when informing trade policy and economic development. This study contributes valuable insights to the understanding of Mexico’s trade dynamics and the potential impacts of political transitions on international trade relationships.

Key words: *Gravity Model, Data Science, Indicators, Trade Dynamics, Mexico Trade.*

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INTRODUCTION

This paper studies trade patterns between Mexico and its trading partners using both a gravity model and a series of sector-specific trade indicators. A dataset of 200 million observations on product-level international trade flows between countries from 1995 to 2021 is used along with 2 other datasets. The analysis is conducted in two ways, first by building a gravity model for Mexico and second by comparing Mexico with NAFTA countries through a set of indicators. The indicators are calculated by sector and include the HHI (Herfindahl-Hirschman Index), the absolute value of imports and exports, substitutability, quotas as a percentage of exported value from external countries and trade balances. These indicators are calculated and compared for Mexico, United States, Canada, and NAFTA as a whole.

Mexico has been a member of NAFTA since 1994 and its trade relations with the United States and Canada have grown significantly in the past decades. However, it is important to understand the dynamics and patterns of these trade dependencies in order to inform trade policy and economic development in the region.

The Gravity Model demonstrates a significant decrease in bilateral trade during the time of Morena's governance. Additionally, indicators show unique sector-specific dynamics, further validating the complex interplay of political, economic, and sectoral factors in shaping trade trends.

Firstly, the Gravity Model is employed to estimate trade flows between Mexico and its trading partners. This approach offers an overall picture of the key factors influencing trade flows in the region and can help identify patterns and trends that are not apparent when analyzing the data at a more detailed level. Secondly, by employing sector-specific indicators to compare trade patterns, a deeper understanding of Mexico's trade flows is achieved, enabling the identification of region and sector-specific patterns and trends. These indicators provide a more comprehensive understanding of trade patterns, supporting the conclusions drawn from the Gravity Model. The results from both approaches is compared and contrasted to provide a more complete understanding of trade patterns between Mexico and other countries within NAFTA and NAFTA as a whole.

The hypothesis driving this study is that the election of a new president in Mexico in 2018 has had a significant impact on Mexico's trade pattern with the US and Canada, leading to changes in the volume, composition, and intensity of trade between the three countries. This hypothesis is based on the idea that political events, such as a change in leadership, can have a significant impact on the economic relationship between countries. Overall, the hypothesis suggests that changes in political leadership can affect trade patterns and relationships between countries, and that understanding these dynamics is important for policymakers and businesses looking to promote trade and economic growth in the region.

The findings of this research not only contribute to the academic understanding of Mexico's trade dynamics but also inform policymaking and business strategies within the region. In particular, it could offer insights into how political changes can affect economic relations, providing valuable information for future political and economic strategies.

MEXICO'S INTERNATIONAL TRADE OVERVIEW

Mexico's international trade landscape presents a complex interplay between various regions and industries. A primary fact of this landscape is Mexico's strong trade dependence on the United States. Approximately 80% of Mexico's exports are destined for the US, and 49% of imports originate from there (Villareal, 2009). China, rising as a significant trading partner, ranks second only after the United States (Gachúz, 2022).

Trade Balance

Mexico's trade balance reflects a complex interplay between various regions and industries. The country has maintained a trade surplus with the United States, largely due to oil exports and the integration of cross-border supply chains. This relationship involves the importation of U.S. components into Mexico, where they are assembled and subsequently re-exported back to the United States. However, Mexico faces a significant trade deficit with Asia, stemming from the surge in imports from the region over the past two decades. Although this growing deficit with Asia has partially offset the trade surplus with the United States, Mexico experienced a considerable setback in its merchandise balance with the collapse of petroleum prices in late 2014. Nevertheless, the balance has shown signs of recovery, with Mexico's demand for Asian goods cooling in 2016, while the surplus with the United States continues to grow. These developments have helped Mexico reduce its reliance on further borrowing to compensate for declining petroleum export revenues (Klitgaard and Scanlan, 2018). Overall, Mexico's balance of trade has experienced fluctuations, with an average of -295.59 USD Million from 1980 to 2023, reaching a high of 6274.69 USD Million in December 2020 and a record low of -6278.12 USD Million in January 2022.

Role of Trade Agreements

Mexico's proactive pursuit of trade agreements has been crucial in expanding its economic relationships and promoting global integration. The North American Free Trade Agreement (NAFTA), implemented in 1994, played a pivotal role in Mexico's trade landscape by fostering economic integration among Mexico, the United States, and Canada. NAFTA facilitated a significant increase in trade flows, granting Mexican exporters preferential access to the vast U.S. and Canadian markets and fueling a surge in exports and cross-border supply chains. Foreign direct investment poured into Mexico's manufacturing sector, capitalizing on the agreement's benefits (Moreno et. al, 2005). However, debates surrounding labor rights, environmental protection, and the impact on domestic industries led to the renegotiation of NAFTA, resulting in the United States-Mexico-Canada Agreement (USMCA) in July 2020. While retaining key elements of NAFTA, the USMCA introduced updated provisions addressing these concerns. Additionally, Mexico has actively engaged in numerous trade agreements worldwide, signing approximately 13 agreements with about 50 countries. Notable agreements include those with the European Union, Pacific Alliance, Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), and

various regional integration initiatives. These agreements have expanded Mexico's trade horizons, reduced tariffs, and facilitated economic cooperation with countries and regions globally. Overall, Mexico's commitment to trade agreements has positioned it as an active player in the international economic arena, driving its competitiveness and opening doors for sustained economic growth (Lefebvre et. al, 2018).

Applying Trade Theory

Mexico's decision to join multiple trade agreements can be understood through the lens of trade theory, which explains the benefits of such engagement. Trade theory emphasizes that countries can experience economic gains by participating in international trade. Firstly, the concept of open versus closed economies becomes relevant. By embracing trade agreements, Mexico opens its markets to foreign goods, services, and investments, promoting competition, efficiency, and consumer choice. Conversely, closed economies tend to face protectionist measures that hinder economic growth and limit access to international markets. Secondly, trade theory recognizes that countries may engage in trade to varying degrees. While some nations opt for limited trade, Mexico's active involvement in numerous agreements reflects its pursuit of deep integration and enhanced economic ties. By forging strong trade partnerships, Mexico gains access to larger markets, promotes diversification, and attracts foreign direct investment, bolstering its economic growth potential and fostering development (Morrow, 2020). Furthermore, trade theories such as the Heckscher-Ohlin model shed light on how trade agreements can facilitate specialization and capitalize on comparative advantages. Through these agreements, Mexico can align its production and export patterns with its abundant resources, resulting in an efficiency boost and maximizing its gains from trade.

Protectionist Policies and Impact

In addition to examining the broader context of Mexico's trade patterns, this study aims to explore the impact of political changes ushered by Morena, the party that won presidential elections and a congressional majority in 2018 and introduced a series of protectionist policies. These policies marked a departure from the previous pro-trade stance and raised concerns about their potential effects on Mexico's trade dynamics. To analyze these effects comprehensively, this research will utilize a gravity model, considering factors such as geographic distance, economic size, and trade costs, to capture the underlying determinants of trade patterns. Furthermore, sector-level indicators will be employed to assess the heterogeneous impacts of the protectionist measures on different industries. Through these analytical tools, this study seeks to shed light on the specific channels through which the protectionist policies have influenced trade flows at the sector level. The findings will contribute to a deeper understanding of the complex interplay between domestic policy decisions and the dynamics of international trade, offering valuable insights for policymakers, businesses, and scholars alike, and informing discussions on trade liberalization and sector-specific measures in Mexico.

DATA

The primary data sources for this study are the CEPII's "BACI" and "Gravity" databases. The BACI database provides detailed yearly information on international trade by country at the product-level product, from 1995 to 2021. This database includes approximately 220 million observations, each representing a bilateral trade flow for 200 different countries at the product level (5000 products). The Gravity database, spanning from 1948 to 2021, contains observations corresponding to a combination of an importing country and an exporting country during each year. This database incorporates socioeconomic indicators and other macroeconomic variables for both countries. These databases are fundamental to the analysis as they include essential variables for the gravity models such as trade flows, distances, GDP, and population. Trade flow reflects the value traded between each country including exports and imports. Distance reflects the geographical distance between countries, which has an impact on trade costs. GDP, or gross domestic product, reflects the economic size and potential market of a country. Population size can influence the size and diversity of a country's domestic market and its demand for imports. Historical variables provide context and can capture the evolution of trade relationships over time.

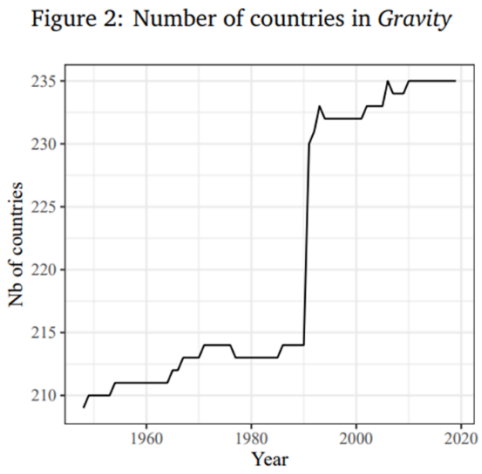
For the political party variable, I will utilize the "Database of Political Institutions," which offers country-level political variables in panel format. This includes the identification of party affiliation, which will be instrumental in the analysis.

Figures 1 and 2 illustrate the structure of the BACI database and the number of countries included in the Gravity database, respectively.

Figure 1: *BACI Database structure. Source: BACI, CEPII.*

t	Year
k	Product category (HS 6-digit code)
i	Exporter (ISO 3-digit country code)
j	Importer (ISO 3-digit country code)
v	Value of the trade flow (in thousands current USD)
q	Quantity (in metric tons)

Figure 2: *Gravity Database number of countries included. Source: Gravity, CEPII.*



The data utilized in this study are all country-level and in panel format. Panel data present several advantages over cross-section data and time-series data, as it controls individual heterogeneity. Panel data offer more variability and reduces collinearity among explanatory variables, enhancing the efficiency of the econometric estimates. It can measure effects that are not detectable in cross-sections and time-series data (Baltagi, 1995).

DESCRIPTIVE STATISTICS

Table 1 presents the summary statistics for the product-level value traded from 1995 to 2021 in different regions: Canada, Mexico, USA, and NAFTA as a whole. It provides a snapshot of the central tendency, dispersion, and range of the trade data for imports and exports. These statistics highlight the varying magnitudes of trade flows in all regions with high standard deviations. Notably, the United States exhibits significantly higher trade volumes than Mexico and Canada. The high standard deviations observed across all regions, particularly in the United States, could imply substantial volatility in trade flows, potentially due to shifts in global demand, policy changes, or economic fluctuations.

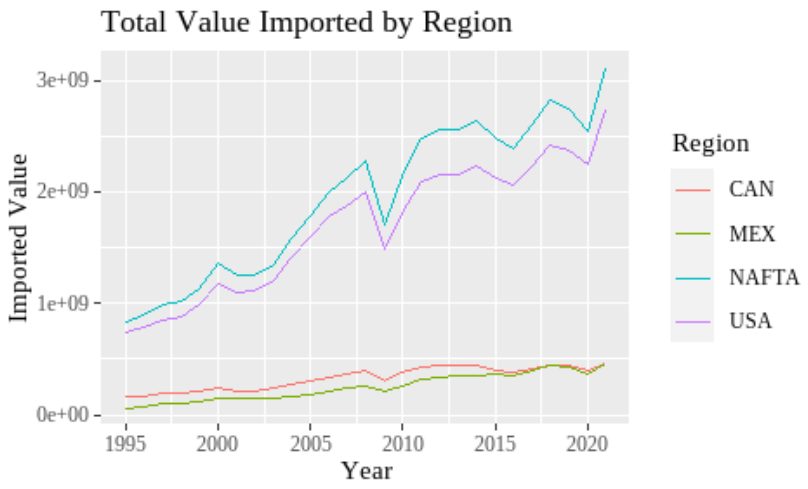
Table 1: *Summary Statistics for Value Traded in Different Regions. Source: BACI, CEPII.*

Variable	***N***	***Mean***	***Std. Dev.***	***Min***	***Pctl. 25***	***Pctl. 75***	***Max***
Region: ***CAN***							
Total Value traded IMP	125569	70887	411614	0.001	2172	40545	26142401
Total Value traded EXP	125569	74415	900669	0.001	346	19307	87460332
Region: ***MEX***							
Total Value traded IMP	120211	56147	396240	0.001	1389	25811	31177207
Total Value traded EXP	120211	62554	647241	0.001	151	11559	47884946
Region: ***USA***							
Total Value traded IMP	129452	352549	3215086	0.001	9088	159078	328337566
Total Value traded EXP	129452	229456	1455381	0.002	6368	111220	110891288
Region: ***NAFTA***							
Total Value traded IMP	129653	405737	3477659	0.001	12163	193875	351764203
Total Value traded EXP	129653	314945	2137368	0.004	8087	145012	146762329

notes: *Value in Thousands (Current USD).*

Figure 3 presents a graph of value imported across years for all four regions (CAN, MEX, USA, and NAFTA), several observations can be made. It is evident that the United States consistently holds the highest value of imports throughout the years and is responsible for NAFTA pattern. This indicates the dominant role of the US market and the significance of intra-regional trade within NAFTA. Mexico and Canada exhibit relatively lower values of imports compared to the US, but their import trends show varying patterns compared to the US. Mexico's and Canada's imports show a steady increase over the years, suggesting a potential expansion of its domestic market and a growing reliance on imports, possibly due to factors such as market liberalization, increased consumer demand, or industrial growth.

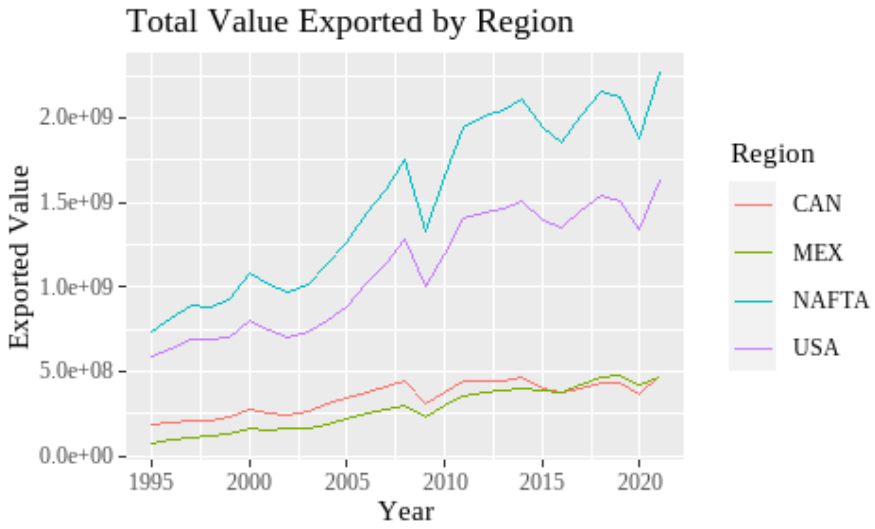
Figure 3: *Total value imported by region. Source: Own elaboration with data from CEPII.*



notes: *Value in Thousands (Current USD).*

Similarly, when examining figure 4 presenting the graph of value exported across years for all four regions, similar key trends emerge. The United States consistently exhibits the highest value of exports, underscoring its position as a major exporter within NAFTA. Mexico's and Canada's exports again show a notable upward trend, demonstrating its expanding role as an exporter within NAFTA. This trend is likely driven by factors such as trade liberalization, foreign investment, and the development of export-oriented industries.

Figure 4: *Total value exported by region. Source: Own elaboration with data from CEPII.*



notes: *Value in Thousands (Current USD).*

The graphical representations of the value of imports and exports over time offer a visual depiction of trade dynamics within NAFTA. They highlight the leading role of the United States in both imports and exports and underscore the increasing significance of Mexico and Canada in the trade bloc.

Table 2 presents summary statistics for key socioeconomic variables that have been included in the gravity model for the case of Mexico. Understanding these variables is crucial in understanding the trade dynamics and dependencies within the country. These statistics indicate the overall economic size and variability within Mexico and with its trading partners (tradeflow). It is worth noting that the minimum value for trade flow is zero, indicating the presence of no trade activity with some countries.

Table 2: *Summary Statistics for Different Socioeconomic variables for Mexico. Source: Gravity, CEPII.*

Variable	***N***	***Mean***	***Std. Dev.***	***Min***	***Pctl. 25***	***Pctl. 75***	***Max***
Region: ***MEX***							
GDP	6552	948429200	270140269	397404144	724703576	1170085511	1298398708
Population	6552	115236	10033	97202	106724	124777	130262
Trade flow	6552	1056043	14305245	0	0	48733	355474942

notes: *GDP and Trade flow in thousands (Current USD). Population in thousand.*

In general, these descriptive statistics help provide the necessary background for further analysis and understanding of the trade dynamics within NAFTA, setting the stage for some econometric analysis in the following section.

GRAVITY MODELS

The gravity model of trade draws inspiration from Newton's gravity equation and suggests that trade volumes between countries are influenced by their relative sizes and the distance separating them (Capoani, 2021). Over the past five decades, this model has gained substantial attention as a predictive tool for trade flows. It establishes a positive relationship between the sizes (or income levels) of two locations and their trade, while inversely linking trade to the distance between them.

Early works by influential researchers such as Tinbergen (1962) have demonstrated the effectiveness of the gravity equations, contributing to its popularity due to its explanatory power and robust findings across various datasets and studies (Anderson, 2011). Gravity models, which focus on international trade, migration flows, and foreign direct investment, have significant political relevance, with international trade flows being the most widely analyzed aspect (Möhlmann, et al., 2010). In this study, I employ gravity models to analyze Mexico's international trade flow, with a particular focus on understanding how the transition in political party leadership has influenced these patterns.

The application of gravity models can become complex when selecting appropriate models and estimation methods. Traditional gravity model estimations often use variables in logarithmic form, employing techniques such as Ordinary Least Squares (OLS), and other variations (Wölwer, et al., 2018). Fixed Effects estimation, introduced by Feenstra (2004) incorporates importer and exporter fixed effects. However, empirical work on gravity models has not definitively determined the most efficient estimation method, whether it be pooled estimation, random effects, or fixed effects. Hence, this study estimates the trade equation using all three methods and compare their results for interpretation.

The first choice was to estimate the model initially using OLS in logarithmic form. Then, to account for the heterogeneity among countries, Fixed Effects and Random Effects estimations followed. Robust standard errors were employed to address country-specific variations, and appropriate tests were conducted to determine the optimal model. This part of the research aims to develop a consistent gravity model tailored to analyzing the trade dynamics between Mexico and its trading partners. By considering the size of the Mexican economy, the size of trading partners' economies, and the geographic distance between them, the models provide valuable insights into how the change in government regime has affected trade flows.

The Gravity Model is expressed as follows:

$$log(Cijt) = +\beta 0 + \beta 1 log(Yit) + \beta 2 log(Yjt) + \beta 3 log(Nit) + \beta 4 log(Njt) + \beta 5 log(D) + \beta 6(contig) + \beta 7(comlang) + \beta 8(LA) + \beta 9(rta) + \beta 10(execme) + \varepsilon$$

Where:

j = 1…252 Country trading with Mexico

i = Mexico

t= 1996...2021

$Cijt$ = Mexico's trade flow with country j in year t

Yit = Mexico's GDP in year t

Yjt = Country's j GDP in year t

Nit = Mexico's population in year t

Njt = Country j population in year t

D = Distance in km between country j and Mexico, can be interpreted as the cost or friction

$contig$ = Dummy variable for regional contiguity

LA = Dummy variable if share common official language

rta = Variable for type of trade agreements between Mexico and country j

$execme$ = Political party variable from DPI for Mexico

The presence of heteroscedasticity in the model can have implications for the validity of the estimated coefficients and the accuracy of statistical inferences (Gómez-Herrera 2011). Because of this, in this study, a homoscedasticity test, specifically the Breusch-Pagan test, was conducted to assess the presence of heteroscedasticity in the model. The test statistic, calculated as BP = 5492.1 with 214 degrees of freedom, yielded a p-value of less than 2.2e-16, indicating strong evidence of the presence of heteroscedasticity.

To address the issue of heteroscedasticity, robust standard errors were employed in all models. Robust standard errors provide a robust estimation of the standard errors, taking into account the presence of heteroscedasticity in the data and therefore ensuring more reliable and accurate statistical inference.

The estimation results of bilateral trade between Mexico and its international partners are presented in Table 1. The analysis employed three different estimation methods to capture various aspects of the trade dynamics. In the first column, Pooled OLS estimation was utilized to provide a general overview of the relationship between the explanatory variables and bilateral trade flows. This approach assumes a common slope across all countries and does not account for country-specific effects. The second column presents the results obtained from the Fixed Effects estimation. This method incorporates importer and exporter fixed effects, allowing for the control of time-invariant country-specific factors that may influence trade flows. By accounting for these fixed effects, the Fixed Effects estimation

captures the within-country variation and provides insights into the specific impact of factors unique to each country.In the third column, the results of the Random Effects estimation are displayed. This method assumes that the individual country-specific effects are uncorrelated with the explanatory variables. This estimation allows for capturing both the time-invariant and time-varying factors that affect bilateral trade flows.

Table 3: *Gravity Models estimation results.*

	OLS	Fixed Effects	Random Effects
(Intercept)	-20.515 (16.598)		-15.946 (15.740)
loggdp_mex	-0.431 (0.258)*	-0.152 (0.252)	-0.195 (0.248)
loggdp_j	1.576 (0.103)***	1.420 (0.194)***	1.516 (0.095)***
logpop_mex	1.696 (1.311)	1.942 (1.506)	0.975 (1.265)
logpop_j	-0.399 (0.163)**	-0.726 (0.578)	-0.347 (0.149)**
log_dist_km	-0.947 (1.142)	10.892 (19.753)	-1.009 (1.093)
contig	1.711 (1.644)		1.701 (1.581)
LA	1.866 (1.431)		1.810 (1.388)
rta_FTA_&_EIA	-0.390 (0.185)**	-0.228 (0.196)	-0.232 (0.135)*
rta_none	-0.268 (0.324)	-0.149 (0.163)	-0.243 (0.141)*
execmePAN	3.627 (0.147)***	3.608 (0.142)***	3.610 (0.143)***
execmePRI	3.352 (0.137)***	3.332 (0.131)***	3.334 (0.130)***
Num.Obs.	4989	4989	4989
R^2	0.576	0.192	0.251
Adjusted R^2	0.575	0.156	0.249

standard errors in ()

notes: *Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' '*

In addition, a Hausman test was conducted to determine the most appropriate model for analyzing bilateral trade between Mexico and its international partners. The Hausman test compares the efficiency of the Fixed Effects and Random Effects estimation methods by evaluating the correlation between the individual country-specific effects and the explanatory variables. The results of the Hausman test, chi-squared (chisq) of 1.8445 with 9 degrees of freedom (df) and a p-value of 0.9937, suggest that there is no significant correlation between the individual country-specific effects and the explanatory variables. Based on this information, the Random Effects estimation seems to be a better fit for the data.

The estimation results presented in Table 1 offer valuable insights into the factors influencing bilateral trade between Mexico and its international partners. Notably, the Random Effects model emerges as the most appropriate model based on the Hausman test, indicating its ability to capture time-varying factors more effectively than the Fixed Effects model. Therefore, the findings from the Random Effects model will be emphasized in the interpretation of the results. Examining the coefficient for the political party variable, we observe a significant decrease in bilateral trade when Morena, the current governing party in Mexico, is in power compared to the two other political parties. These finding reflects the impact of political power shifts on trade dynamics, underscoring the importance of considering the specific policies and strategies implemented by different political parties in Mexico. The coefficients for the other two parties suggest that the policies enacted by Morena may have introduced protectionist measures or regulatory changes that have hindered international trade flows.

While interpreting the results, it is crucial to acknowledge that certain variables exhibit variations across the different models. For example, the coefficient for the GDP variable, loggdp_mex, is negative in the OLS model but becomes statistically insignificant in the Fixed Effects and Random Effects models. This suggests that the effect of Mexico's GDP on trade is not robust when controlling for time-invariant or time-varying factors. Similarly, the coefficient for the distance variable, log_dist_km, fluctuates across the models, highlighting the complexity of the relationship between distance and trade. It is worth noting that the Random Effects model demonstrates relatively consistent results with the other models for several variables, indicating the reliability of those findings.

In the next section, to complement the regression results and gain a deeper understanding of the relationship between bilateral trade and political power shifts, a series of indicators will be measured per sector. These indicators provide insights into specific sectors where the observed changes in trade dynamics originate from.

SECTOR-SPECIFIC INDICATORS

By examining sector-specific indicators, such as trade volumes, HHI, Substitutability, trade balances and market shares per sector we can identify how different sectors were affected by the political party in power. This analysis helps to uncover whether the observed decrease in bilateral trade during Morena's tenure is concentrated in particular sectors or if it is a widespread phenomenon across the economy.

Furthermore, sector-specific indicators allow us to explore the underlying reasons for the observed trade patterns. For instance, we can infer whether the decline in trade is driven by changes in trade policies, protectionist measures, or shifts in supply chains. This more granular analysis will provide a comprehensive understanding of the mechanisms through which political power shifts impact bilateral trade dynamics. The indicators used are described as follows:

1. **Trade volumes:** Trade volumes measure the total value of goods exchanged between Mexico and its international partners within specific sectors. By analyzing trade volumes, we can identify the sectors experiencing significant changes in trade flows during different political party administrations.

2. **Herfindahl-Hirschman Index (HHI):** The HHI is a measure of market concentration within a sector. It calculates the sum of squared market shares of individual firms within a sector. By examining the HHI, we can assess the level of competition and market structure within specific sectors. Changes in the HHI during different political party administrations can indicate shifts in market power and potential effects on trade patterns.

$$HHI = \sum_{i=1}^{n} (si^2)\, w_j$$

   where si is the market share of external supplying country i in Mexican imports, n is the total number of external supplying countries and w_j is the weight of each product in each sector.

3. **Substitutability:** The substitutability indicator measures the degree to which goods and services from different sectors can be used as substitutes for each other. By examining the substitutability of sectors by looking at the value exported and imported, we can identify sectors that are more or less sensitive to changes in trade policies or market conditions. A higher ratio suggests a higher dependence on imports, whereas a lower ratio indicates a greater capacity of Mexican production to meet the demand for specific sectors.

4. **Trade balance:** The trade balance indicator measures the difference between the value of a country's exports and the value of its imports. It provides insights into whether a country has a trade surplus (exports exceed imports) or a trade deficit (imports exceed exports) in a particular sector. A positive trade balance indicates a surplus, meaning the country is exporting more than it is importing, while a negative trade balance indicates a deficit, meaning the country is importing more than it is exporting.

5. **Country market shares per sector:** Trading country market shares provide information on the relative position a country has in different sectors in terms of their share of total trade. By examining changes in their shares over time, we can identify sectors that have gained or lost competitiveness and have changed during different time frames.

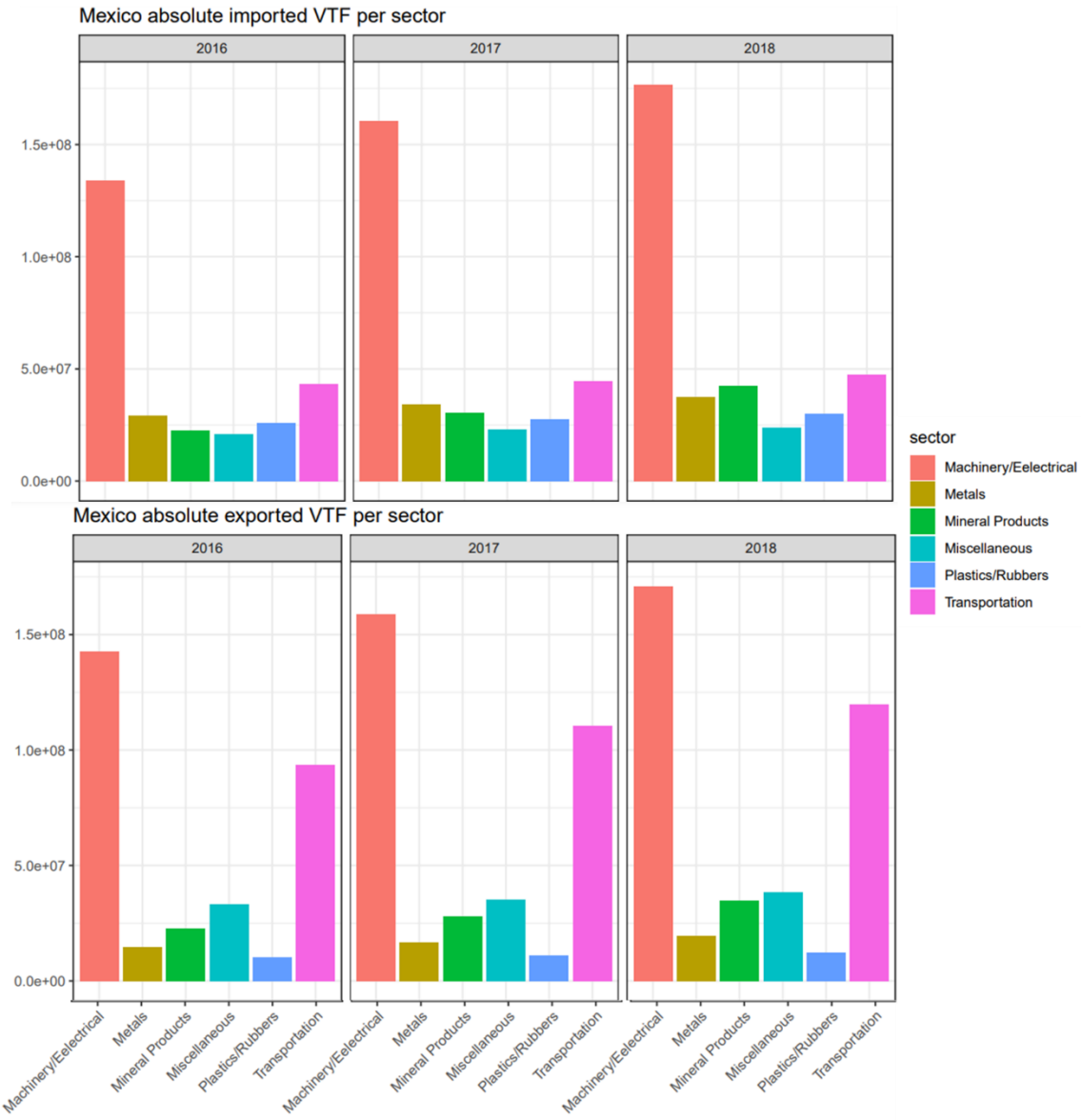
Results of indicators

This section presents the results of the indicators analysis, focusing on Mexico in 2018 and drawing comparisons with the US, Canada, and the NAFTA region as a whole. To simplify the analysis, the results focused on the 6 most important sectors in Mexico based on value added in the corresponding order: Machinery/Electrical, Transportation, Mineral Products, Miscellaneous, Metals and Plastics/Rubbers.

1. Trade Volume:

The increase in trade volume in Machinery/Electrical and Mineral Products sectors in 2018 indicates an overall growth in these sectors at the start of the Morena administration. This could be attributed to a variety of factors such as changes in policy, market demand, or trade relations with other countries. It is important to consider that the increasing trend started before Morena's tenure, suggesting the possibility of a continuation of previously established trade practices rather than novel initiatives. The similar trends observed with the US and NAFTA suggest shared market dynamics, while the stable trade volumes with Canada may point towards established trade relationships.

Figure 5: *Mexico trade volume per sector. Source: Own elaboration with data from BACI, CEPII.*



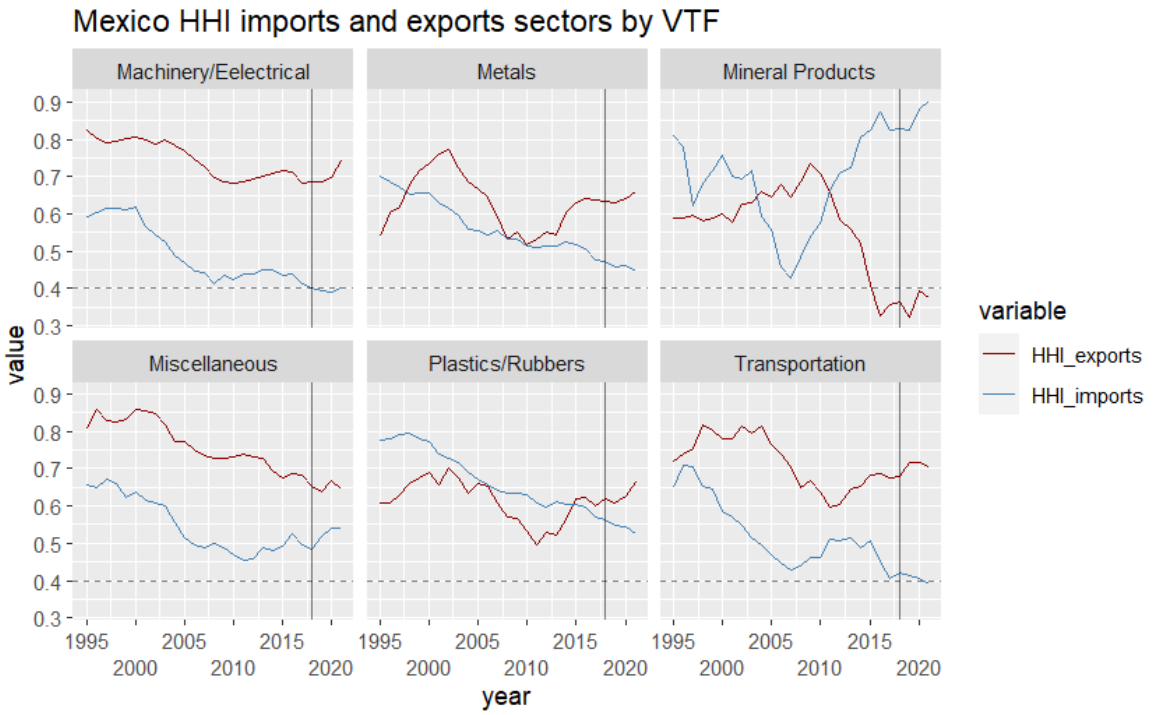
notes: *value in thousands (Current USD). Canada, US and NAFTA figures in the Appendix.*

2. HHI (Herfindahl-Hirschman Index):

Mexico's HHI index indicated a high level of trade concentration, a natural consequence of its robust trade relationship with the US. However, 2018 showed a marked decrease in import concentration for sectors like Machinery/Electrical and Metals. This could reflect a strategic diversification in import sources, falling in line with a pre-existing trend and potentially indicative of an expansive trade policy during the Morena administration. The Mineral Products sector demonstrated an intriguing trend, with import concentration breaking away

from its previous increase, and instead showing signs of growth in export concentration after a period of decrease. Transportation and Miscellaneous sectors presented differing dynamics. For the former, there was a decrease in import concentration and an increase in export concentration, suggesting an improved competitiveness or change in domestic policy favoring local production. On the other hand, the Miscellaneous sector experienced an increase in import concentration, hinting at an increased dependency on foreign goods, possibly due to changes in consumption patterns or market availability. As for export concentration, there was an overall upward trend across most sectors, but a decrease was noticed in Mineral Products and Miscellaneous. This could be due to a variety of reasons, including alterations in export strategies, shifts in global market demand, or changes in domestic production capabilities. When compared with the trends in the US and Canada, distinct patterns emerge, suggesting divergent market dynamics in sectors such as Miscellaneous and Mineral Products. For the remaining sectors, the trends were relatively congruent, possibly reflecting shared economic conditions or trade practices.

Figure 6: *Mexico HHI per sector. Source: Own elaboration with data from BACI, CEPII.*

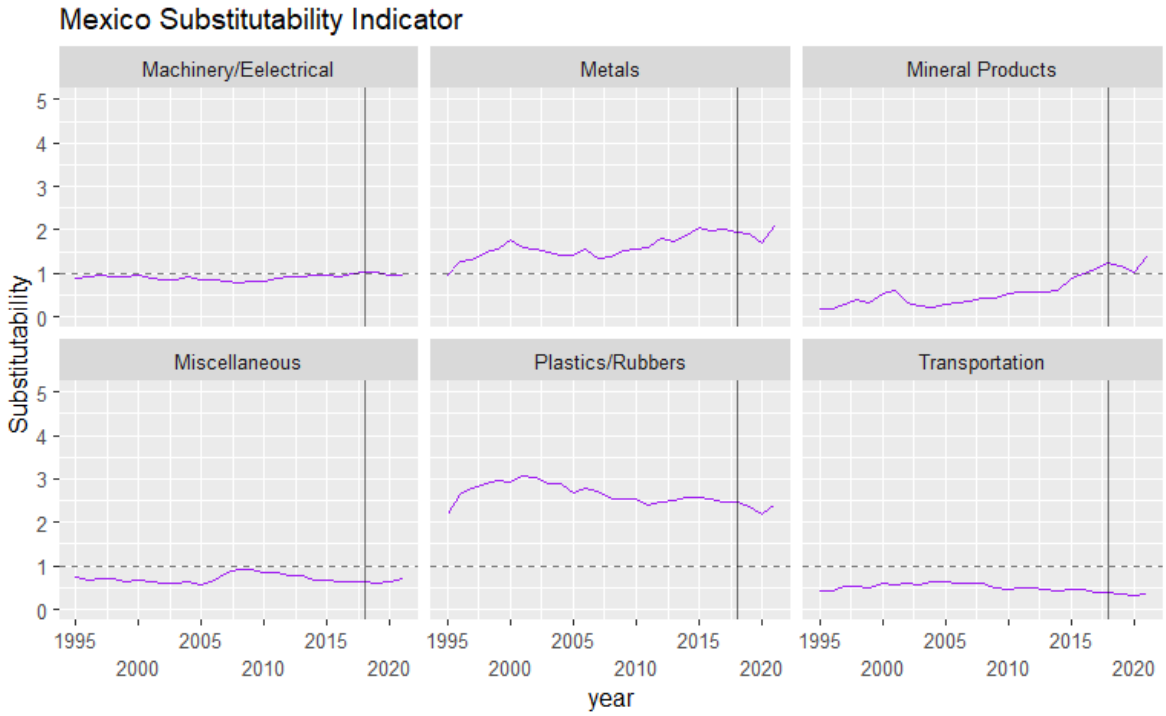


notes: *values above 0.4 mean "high" concentration, European Commission (2021). Canada, US and NAFTA figures in the Appendix.*

3. Substitutability:

Substitutability in Mexico's sectors showed constant results across. However, in sectors such as Metals and Plastic/Rubbers a slightly decrease is observed. Also, there was increasing trend in Mineral products and changed to decreasing in 2018. This can imply that these sectors became less reliant on imports, hinting maybe at increased local production capacity. A comparative analysis with the US, Canada, and the broader NAFTA region brought to light varying substitutability patterns. For instance, while the substitutability in Canada's Metals and Plastic/Rubber sectors remained constant, the US demonstrated an uptick. The Mineral Products sector across all three - US, Canada, and NAFTA - maintained a decreasing substitutability trend, possibly indicating a shared market influence or similar policy directions. These comparative insights underscore the diversity in trade dynamics across different regions and sectors.

Figure 7: *Mexico substitutability per sector. Source: Own elaboration with data from BACI, CEPII.*



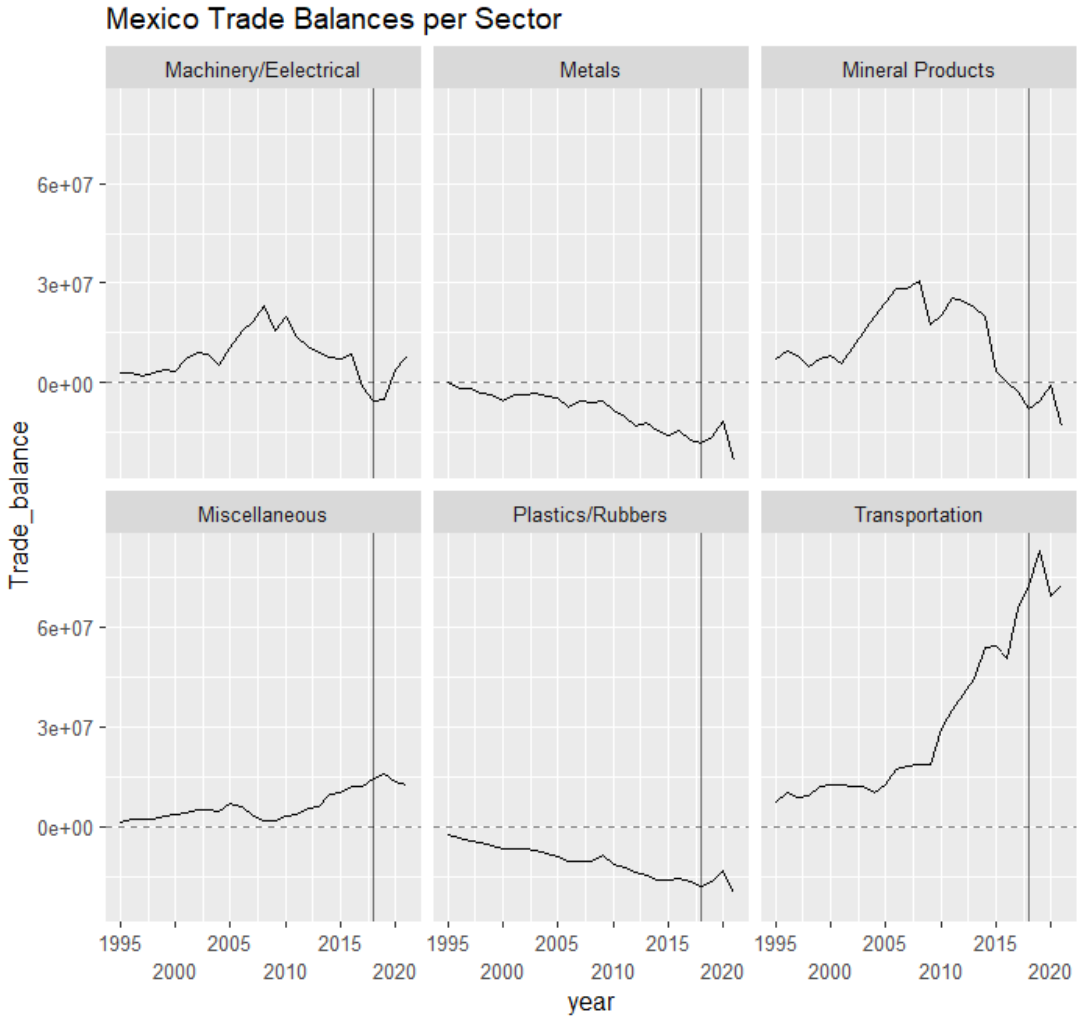
notes: *values above 1 mean "less" able to substitute with exports, European Commission (2021). Canada, US and NAFTA figures in the Appendix.*

4. Trade Balances

Transportation and Miscellaneous sectors maintained a positive trade balance, indicating that the value of exports in these sectors exceeded the value of imports. However, sectors such as

Plastic/Rubbers and Metals consistently showed negative balances, implying a higher reliance on imports. Interestingly, two of Mexico's key sectors, Machinery/Electrical and Mineral Products, demonstrated diverging trends around 2018. The Mineral Products sector's trade balance switched from positive to negative, potentially pointing to increasing imports or decreasing exports. Conversely, the Machinery/Electrical sector, after a dip, rebounded to a positive balance. A comparative view with the US, Canada, and the broader NAFTA region reveals quite distinct trends, indicating the unique market dynamics and competitiveness of these sectors in each country.

Figure 8: *Mexico Trade Balances per sector. Source: Own elaboration with data from BACI, CEPII.*



notes: *value in thousands (Current USD). Canada, US and NAFTA figures in the Appendix.*

5. Country Market Shares per sector

The study of market shares per sector offers a nuanced understanding of shifts in trading patterns and the competitiveness of different economies. In 2018, in the Machinery/Electrical sector, a slight decrease in imports from China was observed, indicating potential shifts in supply chains or changes in trade policies. Similarly, the Metals sector witnessed an increase in imports from Vietnam, possibly indicating a change in sourcing patterns. For Mineral Products, the dynamics were more complex, with a significant increase in imports from various Asian countries and a decrease from NAFTA countries. This shift might indicate changes in global demand and supply patterns or alterations in the trade relations between these regions. The Miscellaneous sector showed a reduction in imports from the US and an increase in imports from Europe and Asia, suggesting shifts in sourcing patterns. The Plastic/Rubbers and Transportation sectors also demonstrated slight adjustments in import patterns. Detailed market share figures per sector are included in the appendix.

The various observed indicators and their changes in 2018 illustrate the many ways in which political transitions can impact bilateral trade dynamics. However, it's critical to situate these findings within the broader scope of global trade trends and macroeconomic conditions, considering the multitude of elements beyond politics that influence trade dynamics. For instance, fluctuations in global demand, changes in commodity prices, shifts in exchange rates, and the evolution of international trade agreements could all contribute to the patterns observed in this study. Consequently, attributing the changes in Mexico's trade dynamics solely to the transition to the Morena administration might oversimplify the complex nature of international trade. Moreover, these results underscore the importance of sector-specific analyses when studying trade dynamics. Each industry may respond differently to political shifts due to the distinct characteristics and competitive landscapes.

Comparison with Gravity Model

After conducting the sector-specific analysis using various indicators, we can now focus into the comparison with the results of the Gravity Model. For instance, in the Machinery/Electrical and Mineral Products sectors, we observed a significant increase in trade volumes during the Morena administration. However, these trends may not be solely attributed to the political transition, as there was already an increasing trend from previous years. Furthermore, a comparison with trends in the US and Canada showed similar patterns, indicating that regional trade agreements like NAFTA could also be influencing these trends.

Similarly, our analysis of the Herfindahl-Hirschman Index (HHI) showed differing dynamics across sectors. While some sectors, like Machinery/Electrical and Metals, experienced a decrease in import concentration, suggesting a diversification of import sources, others like Miscellaneous saw an increase. On the substitutability front, the observed trends in sectors like Metals and Plastic/Rubbers could potentially indicate a lessening dependency on imports, perhaps suggesting maybe an increased local production capacity. The analysis of

trade balances and market shares in different sectors further underlines the sector-specific impacts of political transitions. For instance, while sectors like Machinery/Electrical and Mineral Products experienced changes in their trade balances during Morena's regime, the shifts were less pronounced in other sectors.

While the gravity model provides valuable insights into the overall impacts of political shifts on bilateral trade flows, the sector-specific analyses reveal a more nuanced understanding of these dynamics. The varied responses across sectors underscore the complexity of trade dynamics, the multiple factors at play and the difficulty in estimating trade policy effects (Piermartini & Yotov, 2016). It also underscores the importance of adopting a granular approach when examining the impacts of political changes on trade.

CONCLUSIONS AND FUTURE WORK

This research provided an in-depth analysis of the influence of political shifts on bilateral trade dynamics, focusing on Mexico during the tenure of Morena's governance. We examined whether the observed changes in trade patterns could be somewhat attributed to the shift in political power, particularly within the context of sector-specific trade indicators and the application of the Gravity Model.

The Gravity Model was an essential tool in our study, highlighting significant aspects of bilateral trade between Mexico and its international partners. The most striking finding from this model was a substantial decrease in bilateral trade during Morena's governance. This outcome, coupled with variations in other factors such as GDP and distance, underlines the complex interplay of variables influencing trade dynamics.

The sector-specific analyses elucidate that these impacts are not uniform across different sectors of the economy. Each sector presents unique dynamics, as observed in trade volumes, HHI, substitutability, trade balances, and market shares. For instance, sectors like Machinery/Electrical and Mineral Products experienced considerable variations in trade volumes and market shares during Morena's governance.

Furthermore, the study's results suggest that trade dynamics are influenced by various factors beyond domestic politics. For instance, regional trade agreements like NAFTA and global economic conditions may also play a crucial role in shaping bilateral trade patterns. Therefore, it's essential to interpret the impacts of political changes within this broader context.

The current research, while offering valuable insights, has potential areas for further improvement and exploration. One way to enhance this study is to delve into a more granular level of analysis by examining the trade dynamics at the product level rather than only at the sector level. This would allow for more precise and detailed insights into how political changes impact specific products and commodities within each sector. Another aspect to consider is the incorporation of different versions or extensions of the Gravity Model. For example, exploring the Poisson Pseudo-Maximum-Likelihood (PPML) estimator could be an effective way to deal with zero trade flows and heteroscedasticity, issues that often arise in Gravity Model applications. Moreover, in addition to political changes, future research could examine the influence of other significant factors on trade dynamics. For instance, analyzing the impacts of economic policy shifts, international trade agreements, or global market conditions could offer a more comprehensive understanding of trade patterns.

In light of these findings, policymakers and trade analysts are encouraged to consider the potential impacts of political transitions on different sectors of the economy when designing trade policies and strategies. Such a nuanced understanding can aid in formulating policies

that are more responsive to the specific needs and circumstances of each sector, ultimately fostering a more robust and resilient trade environment.

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ANNEX A: TRADE VOLUMES PER SECTOR

Figure 9: *US trade volume per sector. Source: Own elaboration with data from BACI, CEPII.*

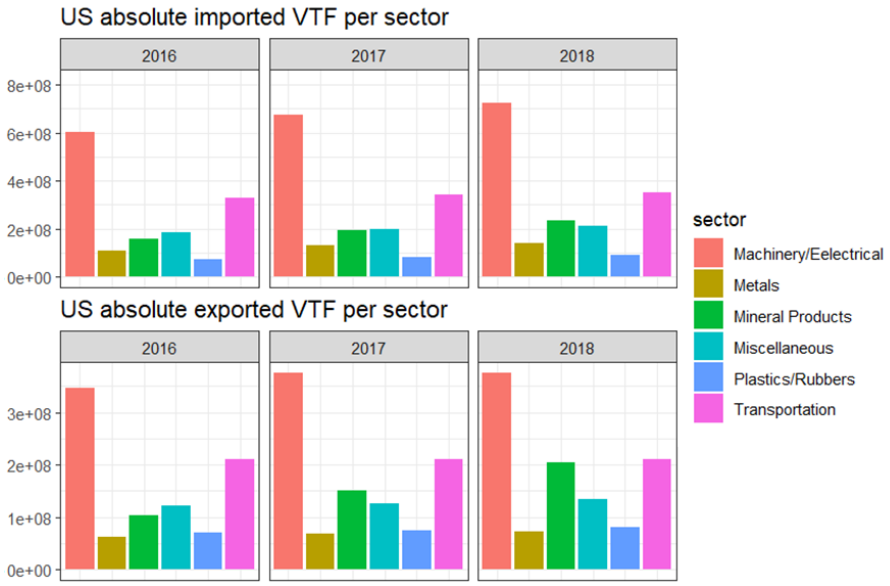


Figure 10: *Canada trade volume per sector. Source: Own elaboration with data from BACI, CEPII.*

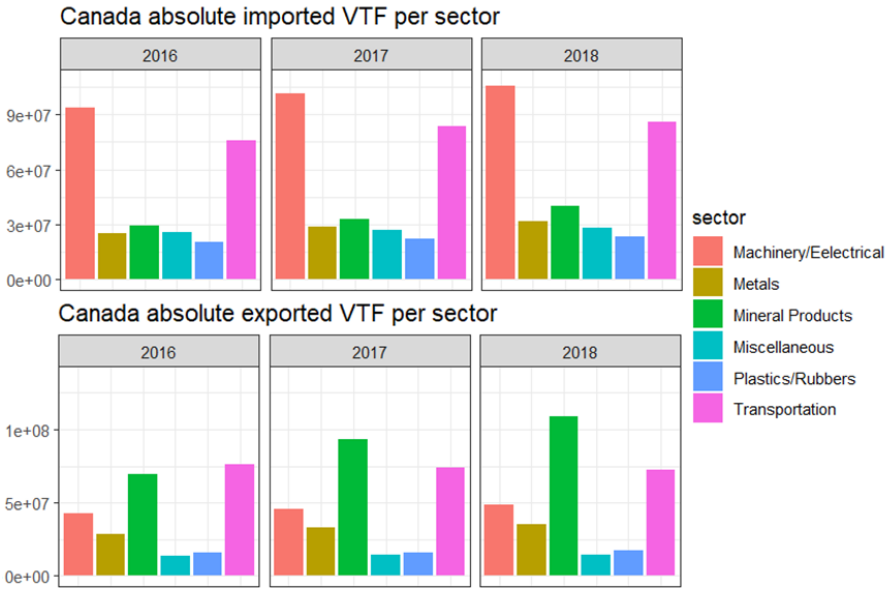
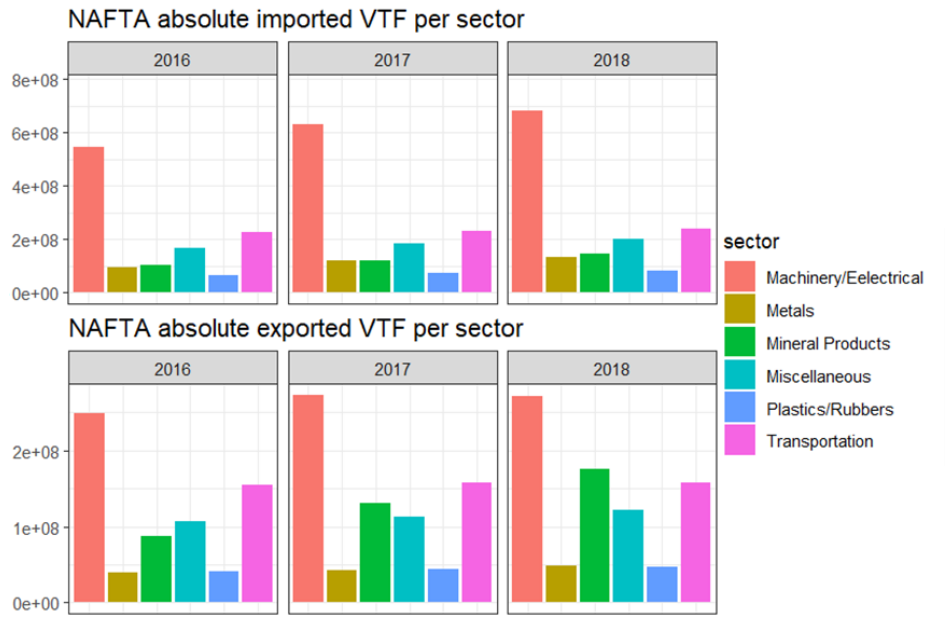


Figure 11: *NAFTA trade volume per sector. Source: Own elaboration with data from BACI, CEPII.*



notes: *value in thousands (Current USD).*

ANNEX B: HHI PER SECTOR

Figure 12: *US HHI per sector. Source: Own elaboration with data from BACI, CEPII.*

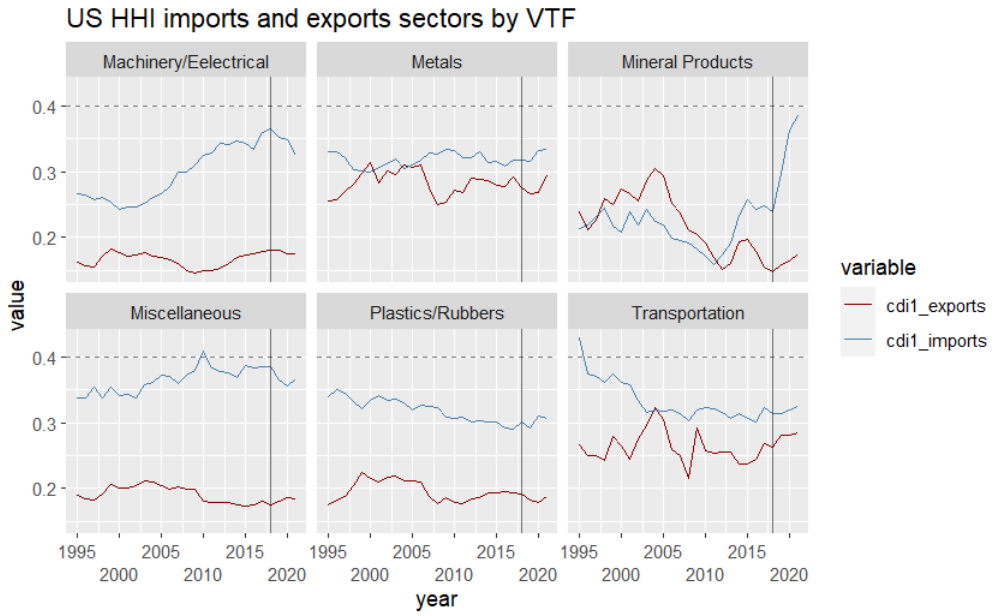


Figure 13: *Canada HHI per sector. Source: Own elaboration with data from BACI, CEPII.*

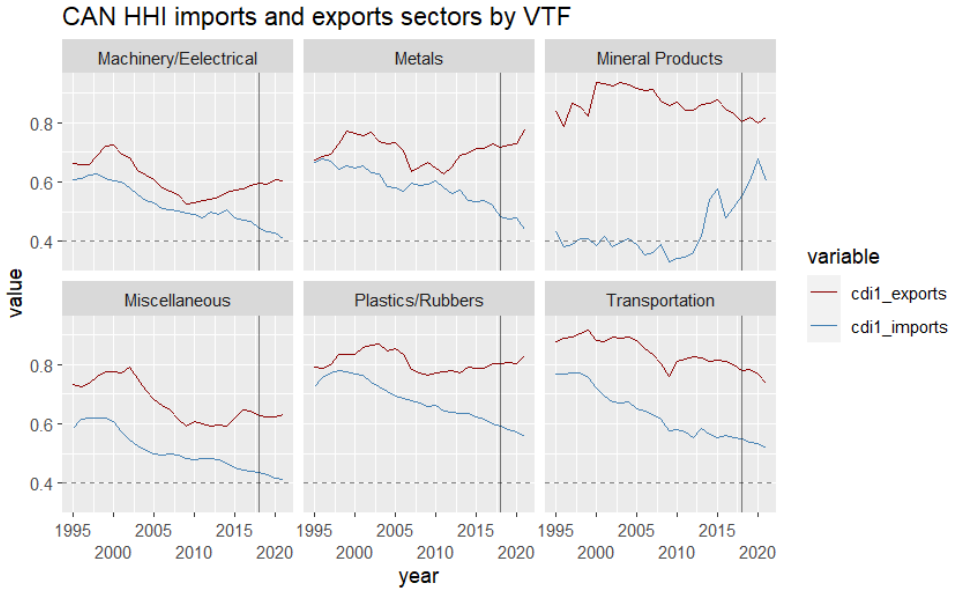
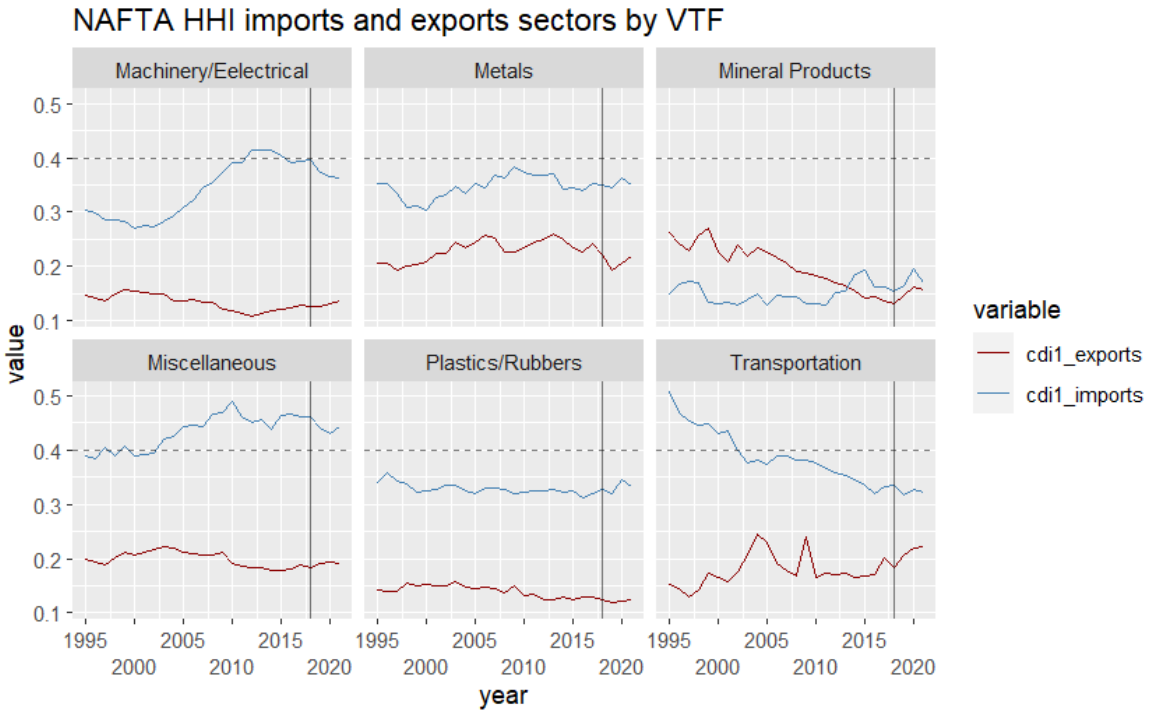


Figure 14: *NAFTA HHI per sector. Source: Own elaboration with data from BACI, CEPII.*



notes: *values above 0.4 mean "high" concentration, European Commission (2021).*

ANNEX C: SUBSTITUTABILITY PER SECTOR

Figure 15: *US substitutability per sector. Source: Own elaboration with data from BACI, CEPII.*

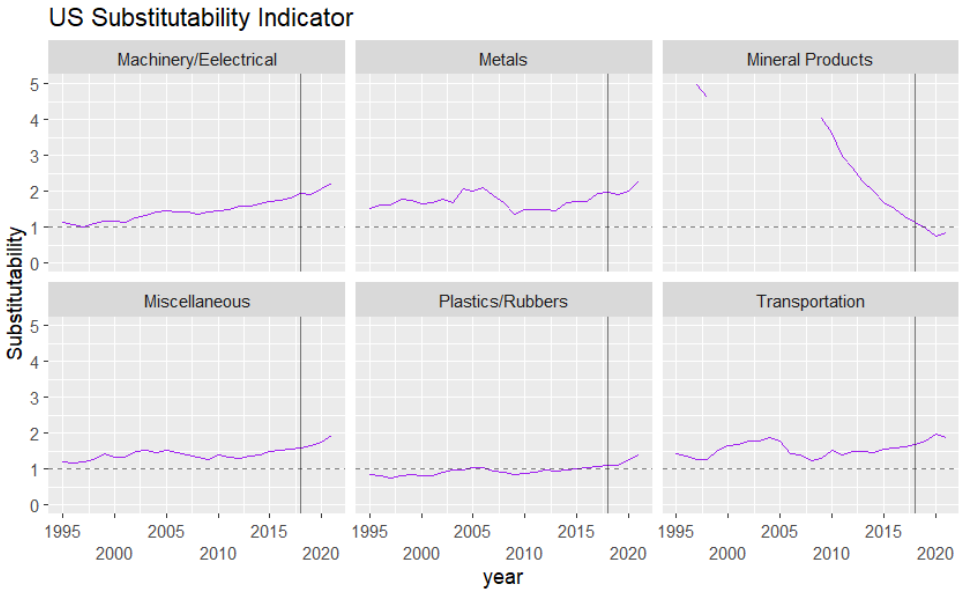


Figure 16: *Canada substitutability per sector. Source: Own elaboration with data from BACI, CEPII.*

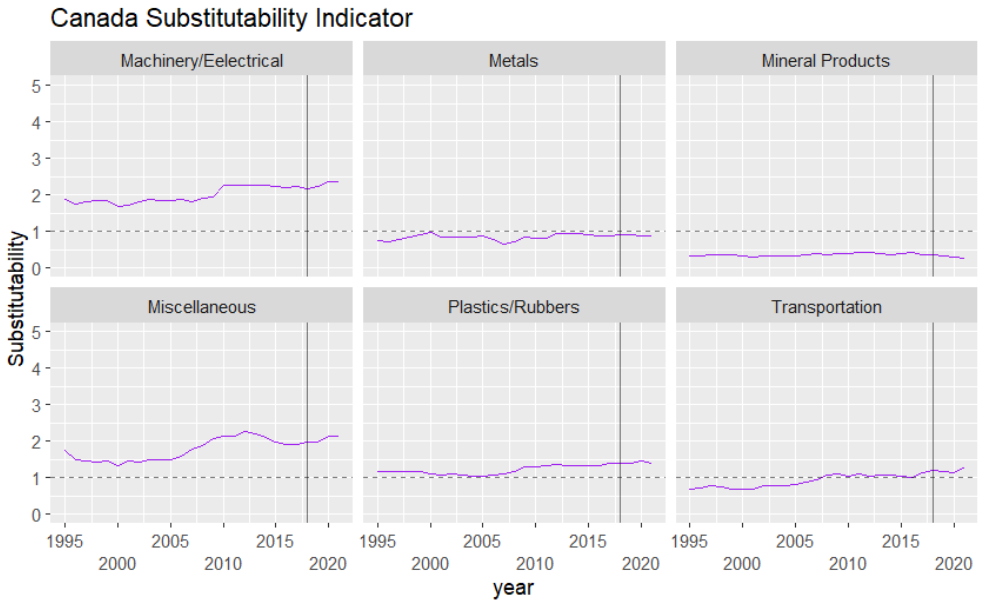
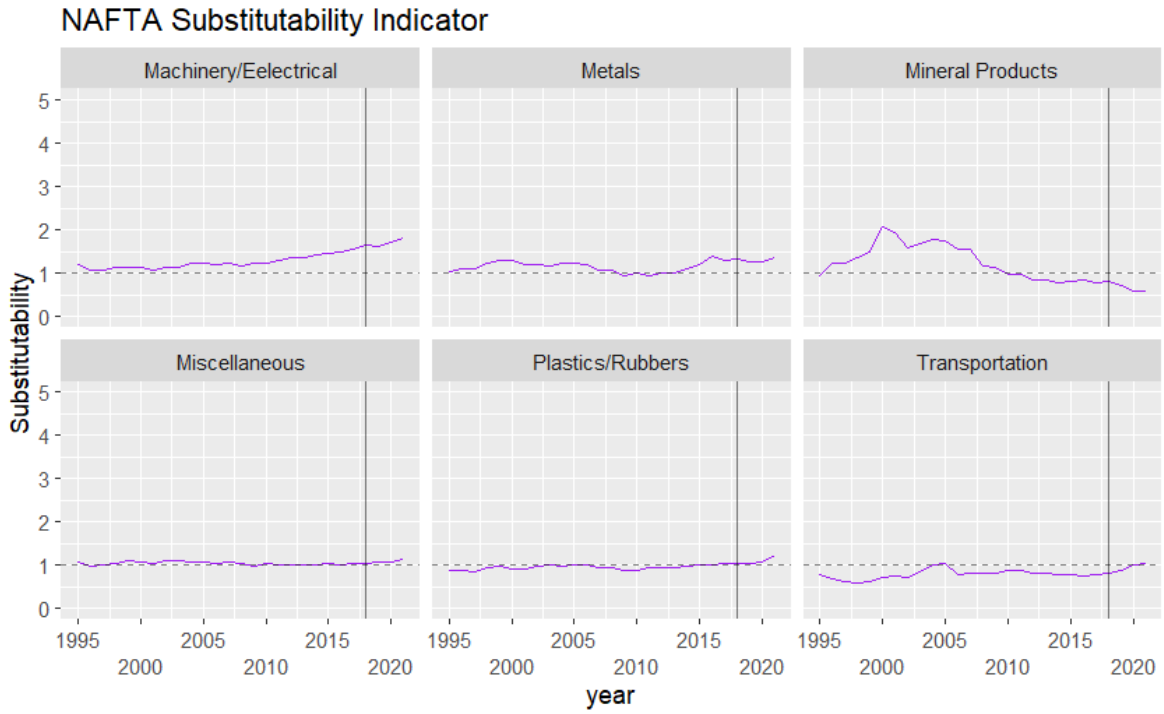


Figure 17: *NAFTA substitutability per sector. Source: Own elaboration with data from BACI, CEPII.*



notes: *values above 1 mean "less" able to substitute with exports, European Commission (2021).*

ANNEX D: TRADE BALANCE PER SECTOR

Figure 18: *US Trade Balances per sector. Source: Own elaboration with data from BACI, CEPII.*

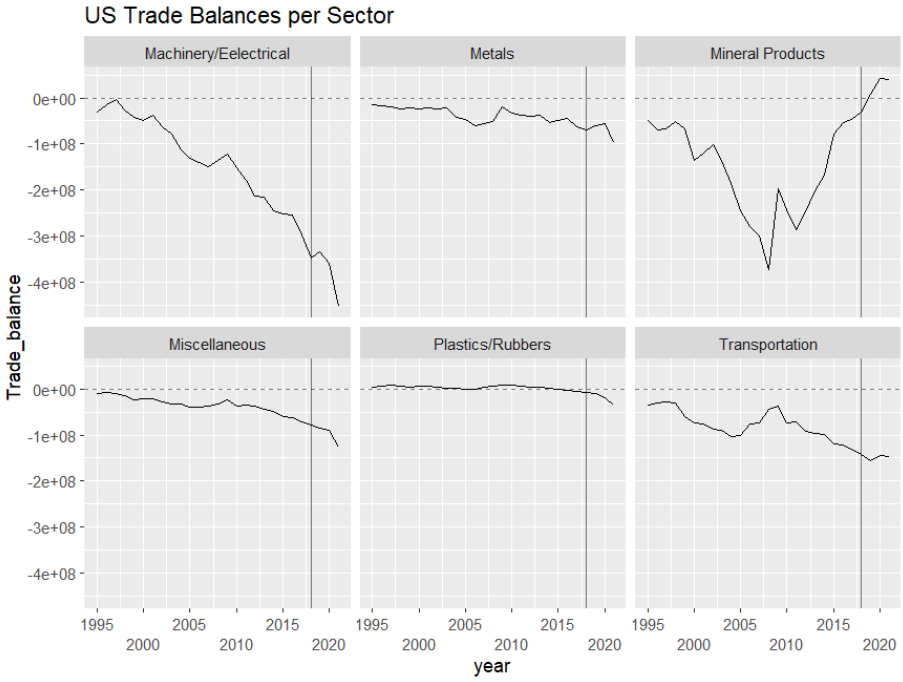


Figure 19: *Canada Trade Balances per sector. Source: Own elaboration with data from BACI, CEPII.*

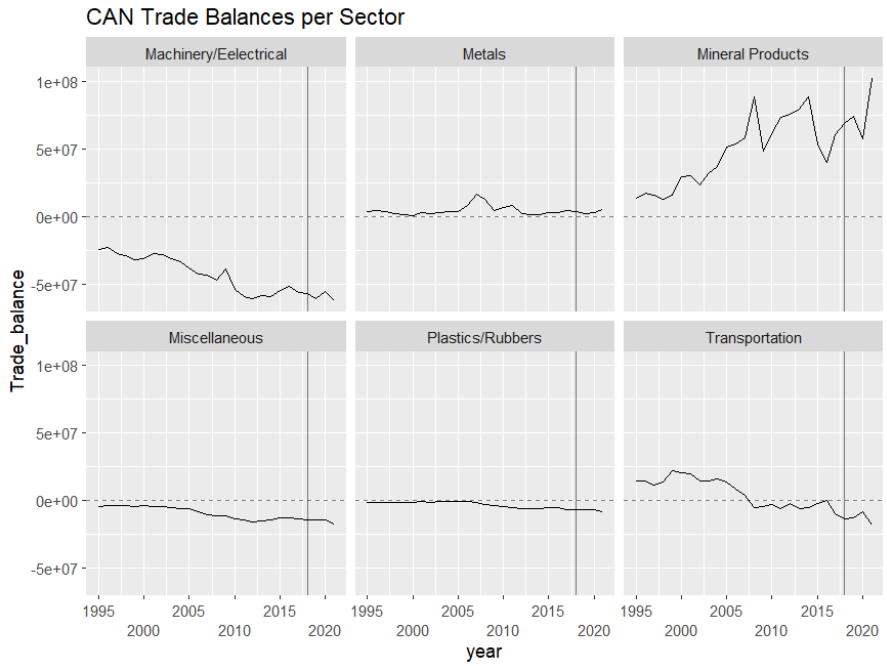
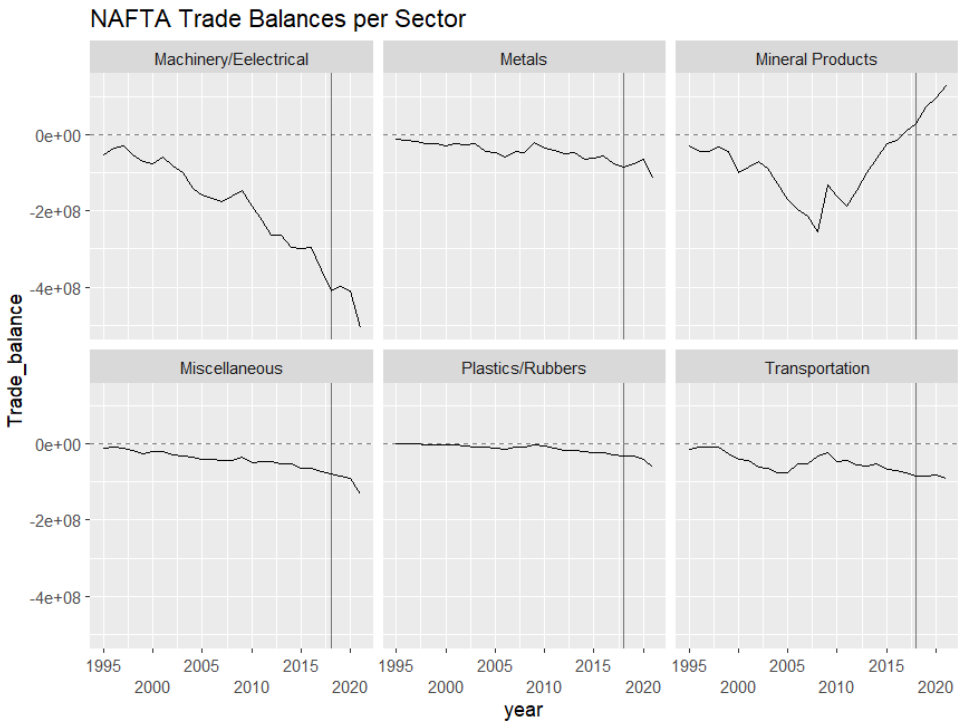


Figure 20: *NAFTA Trade Balances per sector. Source: Own elaboration with data from BACI, CEPII.*



notes: *value in thousands (Current USD). Canada, US and NAFTA figures in the Appendix.*

ANNEX E: COUNTRY MARKET SHARES PER SECTOR

Figure 21: *Mexico Machinery/Electrical importing countries market share. Source: Own elaboration with data from BACI, CEPII.*

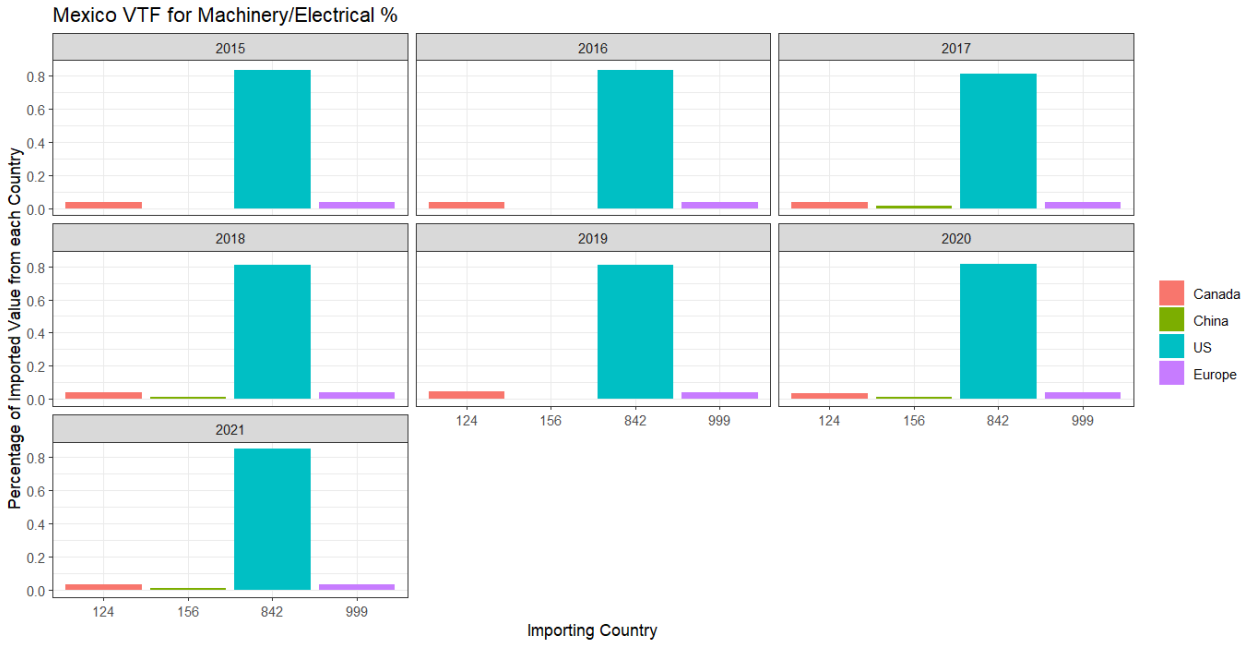


Figure 22: *Mexico Mineral Products importing countries market share. Source: Own elaboration with data from BACI, CEPII.*

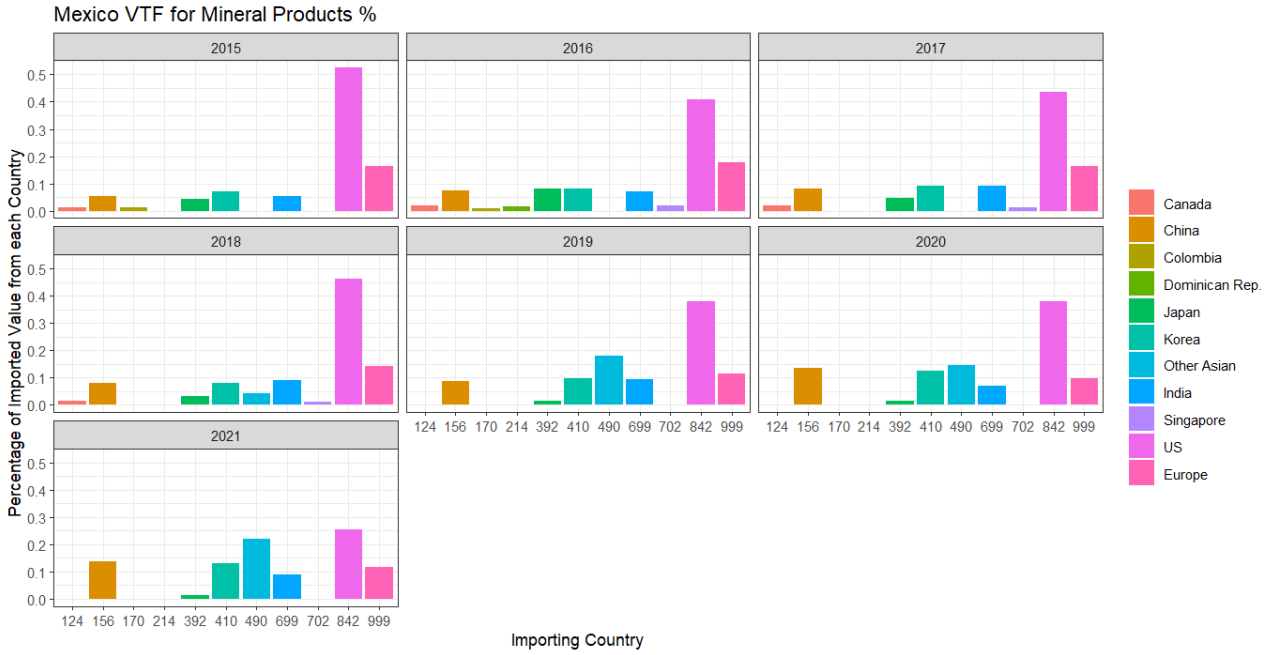


Figure 23: *Mexico Metals importing countries market share. Source: Own elaboration with data from BACI, CEPII.*

Figure 24: *Mexico Miscellaneous importing countries market share. Source: Own elaboration with data from BACI, CEPII.*

Figure 25: *Mexico Transportation importing countries market share. Source: Own elaboration with data from BACI, CEPII.*

Figure 24: *Mexico Plastics/Rubbers importing countries market share. Source: Own elaboration with data from BACI, CEPII.*