

Impact of the United States-Mexico-Canada Agreement (USMCA) Rules of Origin on the Automotive Sector in Mexico Impacto de las reglas de origen del Acuerdo Estados Unidos-México- Canadá (T-MEC) en el Sector Automotriz en México

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Abstract: This article aims to analyze the impact of the USMCA's new rules of origin on the automotive Sector in Mexico. Specifically, possible adjustments on light vehicle production, variations in the imports of regulated auto parts, and changes in labor regulation are explored. Regional value content (RVC) reported for each car assembled in Mexico and sold in the USA in 2020 and 2021 is analyzed to understand the dynamics of change and protectionism. We used a trade database to analyze changes in imports of the groups of regulated auto parts to determine growth trends. Companies comply heterogeneously to the new rules of the agreement depending on their product strategies, how far they are from meet the new RVC threshold, and the imposed tariff. Rules of origin affected German and Asian automakers producing in Mexico more than their competitors; however, they underwent fewer adaptive changes.

Keywords: Automotive Industry, USMCA, industry relocation, rules of origin, protectionism.

Resumen: Este artículo tiene como objetivo analizar el impacto de las nuevas reglas de origen del T-MEC en el sector automotriz en México. Específicamente, se exploran posibles ajustes en la producción de vehículos livianos, variaciones en las importaciones de autopartes reguladas y cambios en la regulación laboral. Se analiza el valor de contenido regional (RVC) informado para cada automóvil ensamblado en México y vendido en los EE. UU En 2020 y 2021 para comprender la dinámica del cambio y el proteccionismo. Utilizamos una base de datos de comercio para analizar los cambios en las importaciones de los grupos de autopartes reguladas para determinar las tendencias de crecimiento. Las empresas cumplen de forma heterogénea las nuevas reglas del acuerdo en función de sus estrategias de producto, de cuan lejos se encuentren de cumplir con el nuevo umbral de RVC y de la tarifa impuesta. Las reglas de origen afectaron a los fabricantes de automóviles alemanes y asiáticos que producían en México más que a sus competidores; sin embargo, sufrieron menos cambios adaptativos.

Palabras clave: Industria automotriz, T-MEC, relocalización industrial, reglas de origen, proteccionismo.

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Introduction

The automotive industry is being deeply transformed by new technologies, government regulation, and consumer preferences. Information and communication technologies (ICT) are impacting manufacturing and vehicles are becoming autonomous, connected, electric, and shared (ACES). Regulation is promoting green electric cars, and a social trend emerged to share vehicles instead of buying them. In addition, coronavirus disease (COVID19) caused a global economic crisis leading to closure of plants for months, affecting sales, production, profits, and breaking global value chains.

The automotive industry in North America also faces other challenges due to the entry into force, in July 2020, of the United States-Mexico-Canada Agreement (USMCA) that introduced four critical new Rules of Origin (RoO) for the automotive industry: a) increase of regional value content (RVC) requirement for vehicles, b) increase of the auto part RVC depending on their classification (core, principal and complementary), c) a novel regional labor value content (RLVC) and, d) a novel RVC for steel and aluminum.

According to the United States International Trade Commission (USITC, 2019, p.85), these changes will increase production of parts and employment in the USA and Canada, and prevent offshoring. Additionally, as the USMCA region imports more vehicles and parts than it exports, the difference may provide an opportunity to substitute imported parts with regional products (National industry of Auto parts (INA, 2020). However, these assertions may oversimplify the possible consequences of the new RoO for the industry. At this

moment, the interpretation of how calculating the parts RVC and later adding to the overall car's RVC is in dispute between the partner countries.

The USMCA went into effect a year ago, and studies analyzing some results are scarce. In this work, we investigate how the new RoO are impacting the automotive industry in Mexico. Particular attention is paid to explaining how specific car models are affected. Since governments assumed that the agreement would favor parts import substitution, regulated parts trade trajectories are analyzed. We propose that the companies' response to the new rules of USMCA will be heterogeneous depending on their product strategies, how far they are from meet the new RVC threshold, and the imposed tariff.

Analysis of specialized literature made it possible to reconstruct industry participation in globalization and regionalization processes. A theoretical frame on localization factors and free trade was elaborated in order to characterize RoO, and explain the response by companies. Other data reviewed were mandatory reports from the American Automotive Labeling Act, government official documents, and research literature. Trade Map database was used to analyze trade growth trajectories of regulated auto parts.

This paper contains four sections: a) description of automotive industry globalization and regionalization processes along with some conceptual antecedents on FDI location, relationship and Foreign Trade Agreements (FTA). b) a succinct analysis of the impact of the North American Free Trade Agreement (NAFTA) in the industry as a precedent for USMCA c) implementation of the new RoO and changes observed in the first year after USMCA, and d) data discussion and conclusions.

Globalization and regionalization of the automobile industry

Globalization gained momentum in the late 1970s through restructuring of the capitalist system. Financial deregulation, trade liberalization and privatization increased capital and trade flows. For 20 years, World trade increased and Multinationals became relevant actors, creating facilities in countries where spatial proximity was critical (Dunning, 1998:47).

Around 1995, regionalism accelerated, and the number of Free Trade Agreements (FTAs)² increased. The economic blocks of the European Union (EU), the Asia-Pacific Basin, and North America consolidated; high and low-cost countries were integrated, benefiting from comparative advantages, e.g., North America incorporated two high-cost countries (the United States and Canada) with one low-cost country (Mexico). As globalization and free trade have been associated with inequality, protectionism became relevant in these years. All this was complicated by the COVID-19 pandemic, which exacerbated trends in anti-globalization (Currant and Eckart, 2020).

The automotive industry is at the center of the globalization and regionalization process. Companies' strategies led to creating productive geographic spaces, the international division of labor, and the generation of global value chains. Mergers and acquisitions consolidated the industry and allowed companies to increase the product spectrum and access new markets and technologies. Automakers promoted the internationalization of Firms and designed global cars and platforms although they were

2. There has been steady growth in regional trade agreements (RTA's). In 1990 there were 22 and by 1995 they doubled (47); in 2020 they had grown 6.5 times (310) and by 2021 RTAs reached 350 (WTO, 2021).

not successful. Toyota used a policy of products targeting regional markets, achieving better results. (Lung and Van Tulder, 2004).

By 2002 the industry had thoroughly assimilated the regionalization process. EU production added to NAFTA accounted for more than half their world output and adding MERCOSUR, the Association of Southeast Asian Nations (ASEAN)³, and the Commonwealth of Independent States (CIS)⁴ reached 70% (Lung and Van Tulder, 2004). By 2020, production regionalization was maintained while changing its epicenter to Asia. The share of the EU and the USMCA region decreased 34.97%. Even adding MERCOSUR, ASEAN, and CIS production reached only 46%, to lose 30 perceptual points in 28 years (OICA, 2021). The decrease was due to China's participation that increased from 5 to 32.5% in 20 years.

Freyssenete (2017) points out that market globalization and homogenization of automobile demand never occurred. On the contrary, globalization generated different “growth modes⁵” and income distribution, thus carmakers had to keep using heterogeneous strategies and failed to reduce the number of platforms in the World. Even without market globalization, the industry increased its internationalization: between 1990 and 2005, its transnational index (TNI) raised from 36% to 56%, getting closer to the World industrial average, which was 60% (Jetín, 2017). Regional automotive production is the dominant pattern, however, globalization transformed the industry by promoting a highly

3. ASEAN (Indonesia, Malaysia, Myanmar, Philippines, Thailand and Vietnam).

4. CIS (Russia, Azerbaijan, Belarus, Kazakhstan, Ukraine, Uzbekistan)

5. “Growth modes area characterized by a main source of national income and by a form of distribution of this income. Depending on the way in which they combine market and labor uncertainties are not all the same” (Boyer and Freyssenete (2002). The productive models, Palgrave Macmillan, 126p. s

complex inter-regional value chain with flows of intermediate goods, information, knowledge and money between geographical production spaces (Sturgeon y cols., 2010).

De-Gortari (2017:1) points out that “in GVC, intermediate input suppliers produce specialized inputs that are only compatible with specific subsequent uses and manufacturing companies in Mexico that export to the US use relatively more US inputs than those exporting to other destinations.” He estimated that the automotive industry’s integration between the two countries is so deep that the US accounts for 74% of foreign inputs embedded in vehicles assembled in Mexico and sold in the US market. In contrast, the US accounts for only 18% of the inputs embedded in a car built in Mexico and sold in the German market.

Published studies on determinants of manufacturing and foreign direct investment (FDI) are profuse. Still, determinants as access and market size, the PIB, the PIB/per capita, and the costs of factors have been consistently mentioned over time and also fulfilled in USMCA. Features of labor such as low wages, skilled and unskilled number of employees, and the number of engineers are also widely mentioned (Hurley, 1959; Dunning, 1998). Agglomerative spatial economies and local service (Dunning, 1980, 1988), transaction costs (Williamson, E. 1979), strategies in the automotive value-added chain (Sturgeon et al., 2010), infrastructure development and regional innovation capabilities (Csíki, Horvath, and Szász (2019). We focus on free trade agreements (FTA’s) and RoO that influence investment location and supply-source decisions.

FTA's assist partner countries to reduce barriers to imports and exports between them: tariff and non-tariff trade barriers may influence companies to locate facilities or investment in a country when increasing the market's size or allowing access to a population with higher PIB/ per capita (Dunning, 1980; 1988; Sturgeon et al., 2010). Reinsch y cols (2019) indicate that FTAs have contributed to configure GVCs by favoring industry linkages and protecting producers from rivals external to the region. However, FTA's RoO defines features of a product to be considered originating in a region in order to receive preferential treatment and may not always benefit GVCs. RoO imposes barriers for companies and countries outside the economic block and can motivate producers to locate production facilities within the countries, partly to take advantage of preferential treatment. On the other hand, complicated RoO can increase transaction costs, and Companies may choose to pay the tariffs rather than comply with the rules.

Strict rules may force companies with low-cost sources of supply outside of FTA's to seek supply sources within the region and thus receive preferential treatment, despite the fact that the inputs may be of higher cost or lower quality. This may happen when the preferential margin is wide enough to incentivize the change of supplier source. RoO may support protectionist goals for inputs and final products in the region. Governments can use them to encourage investment and create well-paid jobs (Estevadeordal y Suominen, 2003).

Background of the USMCA free trade agreement

The automotive sector has more than 90 years in Mexico, contributes 3.8% to national GDP and 20.2% to manufacturing GDP, generates 1.8 million jobs, manufactured 3.9 million

vehicles in 2019, and occupies seventh place in the world as a vehicle producer (AMIA-INEGI, 2018). The sector has 22 complete car assembly plants, more than 2000 suppliers, and 13 private engineering and design centers. This growth pattern explains the concern of developed countries about the relocation of design services and research and development.

Results of the automotive industry in Mexico after 20 years of NAFTA have been controversial. Benefits include increased production, contribution to total and manufacturing GDP, and employment creation. However, the pull to grow other industries, integrate national suppliers in global value chains, and research and development capacities have been insufficient (Alvarez, 2014).

Growth of the automotive industry in Mexico is explained by drivers-of-location decisions of foreign direct investment (FDI), including: low wages, cheap and skilled labor, a broad base of international suppliers, agreements with several countries that trade with preferential tariffs with Mexico, proximity with the USA market, government support to attract foreign investment, agglomerative spatial economies, local services, and a devalued currency that decreased production costs. Still, there are infrastructure problems such as limited natural gas and high prices of electric supply (Alvarez, y González 2015; Alvarez y Carrillo, 2017; Dussel Peters and Gallagher, 2013; Covarrubias, 2019, Martinez and Carrillo, 2019, Klier, 2019).

a) Production. NAFTA's total car production grew 18.4 % between 1994 and 2019 (Table 1). Still, the USA and Canada decreased their participation from 11.07 to 10 million and from 2.13 to 1.9 million vehicles, respectively, while Mexico increased from 0.9 to 3.9

million cars. It is necessary to consider that growing participation is related to multinational Firms from different countries, mainly from the USA. In 2020 regional production fell 20% due to the COVID19 crisis and Canada was the most affected, falling eleven percentage points under the region's mean.

Table 1. Production of light cars in the NAFTA region 1994-2019								
millions of vehicles								
	1994*	2000	2005	2009	2015	2019	2020	2019/2020
EUA	11.07	12.7	11.9	5.7	12.1	10.8	8.8	18.50%
México	0.9	1.9	1.6	1.5	3.5	3.9	3.1	20.51%
Canadá	2.13	2.9	2.6	1.5	2.2	1.9	1.3	31.50%
Total	14.1	17.6	16.3	8.7	17.9	16.7	13.3	20.35%
Source: Data from International Organization of Motor Vehicle Manufacturers (OICA), http://www.oica.net/								
* Prepared with information from Carbajal and Del Moral (2014).								

b) Foreign direct investment (FDI). Investment in the automotive industry has been substantial, and the USA has received much greater investment flows than its two trading partners. Between 2010 and 2016, carmakers invested 80.7 billion USD in the USA and only 25.8 in Mexico, while part suppliers invested 44.4 billion USD in the United States, 3.4 billion USD in Mexico (CEPAL, 2017, 174). In 2019, FDI in the automotive sector in Mexico reached 7,463 million USD or 21.9% of the total. However, by 2020 it showed a significant decrease in car manufacturing (13.8%) and parts (55.9%) since investments were stopped in the world due to the fall in sales due to the COVID19 crisis.

c) Regional Trade. Regional trade increased in the NAFTA years, and the total trade balance of the USA with Mexico changed from a surplus of 1,349 million USD in 1994 to a deficit of 101,400 million in 2019. In the same way, the deficit with Canada increased from 13,967 to 26,794 million. Most of the deficit with Mexico is related to the automotive industry. COVID19 crisis affected trade in 2020 and automobile and part imports in the region dropped 19.83%, while exports decreased 20.95% (Trade Map, 2020).

d) Restructuring of production. During the 2008 economic-financial crisis, North American output lost 32.4%, decreasing from 12.9 to 8.7 million vehicles. The restructuring involved moving facilities, adjusting production, replacing models. In addition, the USA and Canada closed plants. Between 2007 and 2011, fifteen facilities in the USA closed: Chrysler (5), Ford (3), General Motors (6), and Nummi (1) stopped producing 1.8 million cars. By contrast, Honda, Hyundai, Mercedes Benz, Toyota, and Volkswagen opened facilities, producing 412 thousand automobiles. By 2015, the USA had recovered its production level due to the Japanese and German automakers (Alvarez y Carrillo, 2017). Analysis of productive restructuring of the NAFTA region confirms the loss of competitiveness of North American carmakers vis-à-vis Germans and Asians.

e) Employment and cost of labor. In the 1980s, large companies followed different strategies to reduce labor costs: production was relocated to low-cost countries, work was reorganized using labor flexibility and subcontracting, benefits in collective contracts, and influence of unions declined (González, 2015). In the USA, the number of employees and automaker's wages decreased while productivity increased: employment decreased 70%

between 2000 and 2012. The average hourly pay fell from 21.68 to 21.29 USD, and labor productivity increased from 10.77 to 13.36 vehicles per employee (Alvarez y González, 2015). In Mexico, “employment increased from 112 thousand to 767 thousand in 2016, the average hourly wage remained at 3.14 USD, and productivity rose 76% from 2007 to 2015” (Covarrubias, 2019, 103). Besides, the devaluation of the Mexican peso has made it even less expensive to produce in the country. By 2020 manufacturing employment in Mexico dropped 2%, decreasing from 100 to 98 thousand jobs and auto parts dropped 6%, falling from 841 to 789 thousand jobs between January and May (INEGI, 2021).

NAFTA's results partly explain the new RoO and the protectionism behind them. It was necessary to recover production spaces, jobs and improve the opinion of workers and citizens of the United States about regional agreements and the benefit they can represent for that country.

The USMCA's new rules of origin (RoO) for light vehicles and the first impacts

The USMCA trade agreement imposed a new RoO, increasing the regional value content requirements so that products not originating in the region pay tariffs for commercial exchange. To avoid taxes, which range from 2.5% for light vehicles to 25% for light trucks, carmakers must meet the mandatory RVC and, if it is necessary to reconfigure the region's models and range of cars commercialized.

a) Regional value content for light vehicles The RVC required on passenger vehicles⁶ and light trucks⁷ increased from 62.5% in NAFTA to 75% in USMCA as calculated by the net cost method. Its compliance is gradual to reach the total in three years from the entry into force of the trade agreement: 66% in 2020, 69% in 2021, 72% in 2022, and 75% in 2023 (Official Gazette of the Federation, DOF, 2020, p. 209). Now it is more challenging to reach the RVC since it is necessary to consider the value of all materials, not only a list, as it was in NAFTA. Also, the interpretation for calculating the RVC is in dispute since the way USA proposes is more challenging to reach the mandatory content.

Table 2. Automotive industry. Rules of origin for light vehicles		
Changes from NAFTA to USMCA		
Rules of origin	NAFTA	USMCA
Rules of origin for light vehicles	Regional value content RVC = 62.5%	RVC under the net cost method RVC= 75% Under the transaction value method RVC= 80%
Rules of origin for parts		If the RVC is calculated under the net cost method it requires that: Core parts are originating and RVC = 75%. Principal parts RVC = 70%. Complementary parts RVC = 65%. If the RVC is calculated under the transaction value method Core parts RVC = 85%. Principal parts = 80% Complementary parts =75%.
Rules of origin for labor value content	No requirements	40% of the value of passenger's cars and 45% of the value of light trucks must be produce by workers making more than 16 dollars per hour
Rules of origin for steel and aluminum	No requirements	70% of corporate steel purchases must be made within the region.
Source : USMCA agreement, Chapter 4, https://usmca.com/rules-of-origin-usmca/		
*Net cost method: $RVC = (NC - VNM) / NC \times 100$ where "RVC is the regional value content, expressed as a percentage; NC is the net cost of the good; and VNM is the value of non-originating materials including materials of undetermined origin used by the producer in the production of the good".		
**Transaction value method: $RVC = (TV - VNM) / TV \times 100$ where "RVC is the regional value content, expressed as percentage; TV is the transaction value of the good, adjusted to exclude any costs incurred in the international shipment of the good; and VNM is the value of non-originating materials including materials of undetermined origin used by the producer in the production of the good"		

6. Passenger vehicle means a vehicle of subheading 8703.21 through 8703.90: Most cars, station wagons, vans, and some pick-up trucks are passenger vehicles.

7. Light truck means a vehicle of subheading 8704.21 or 8704.31, except for a vehicle that is solely or principally for off-road use. Motor vehicles for the transport of 15 or less persons.

Impact of the regional value content rules on vehicle production in Mexico

The regional content of each vehicle manufactured in Mexico and sold in the USA was reviewed. Two groups were observed: cars that complied with 75% of RVC since 2020 (table 3) and those that did not comply (table 4), then we compared data with RVC reported in 2021. Already, one year after the agreement's entry into force, some changes can be observed.

The average RVC of cars (table 3) increased from 81.13% to 82.69% between 2020 and 2021. Since the beginning, these vehicles have complied with the USMCA's rules of origin. By 2021 Ford excels with an RVC growth of 10.5%, followed by FCA (1.95%), NISSAN (1.72%), and GM (0.7%); however, Audi and Mazda show a slightly RVC decrease.

Three of the four models produced by FCA in Mexico and sold in the USA (Ram 1500, Dodge Journey, and Jeep Compass) had already met the mandatory RVC by 2020. However, FCA plans to stop Dodge Journey production in Mexico and build it in Italy. Thus, the company did not sell the Dodge model in the USA in 2021.

Ford's strategy changed, and it will sell only SUVs in the USA market. As a result, fusion and Lincoln models stopped sales. Instead, the models are replaced by the SUV, Bronco, which has 90% RVC. As a result of these changes, Ford vehicles' average RVC increased 10.5% over the previous year.

In the same way, five of the six models that GM exports comply with the new RVC: The company kept the same products range with Chevrolet Blazer, Chevrolet Equinox, GMC

Terrain, Chevrolet Silverado, and GM Sierra. The average RVC of G.M. increased 0.7% from the previous year.

Audi manufactures its Q5 model in Puebla, and has a 76% RVC. The company manufactures the engine in Mexico and imports the transmission from Germany. Since the vehicle transmission is a core part and it must be region originating, Audi will have to decide whether to comply or pay duties. This vehicle is especially for the USA market.

Three of the five models NISSAN manufactures in Mexico complied with the 75% RVC (Versa, Kicks, and NV 200 Cargo). NISSAN kept the same product spectrum, however it increased the RVC of these models by 1.72% in 2020. And finally, Mazda is selling the Mazda 3 with 75% RVC in 2020; however, the transmission is from Thailand, and it will need to be sourced from the USMCA region.

The slight change in the first group's average RVC (1.56%) is relevant to our analyses. We observe that carmakers began with some changes to increase the RVC in their products, and they also substituted models that completed their life cycle, starting a new product spectrum.

Table 3. Vehicles produced in Mexico and sold in the USA market in 2020 and 2021 that comply with the rule of 75% or more of regional content value

Brands and models manufactured in Mexico and sold in the USA market	RVC 2020				RVC 2021			
	Percent content US	Percent Content Mexico	Source of vehicle's engine	Source of vehicle's transmission	Percent Content US	Percent Content Mexico	Source of vehicle's engine	Source of vehicle's transmission
FCA								
1 Ram 1500 pickup/FCA/Satillo, Mexico	55%	29%	US, Mx	US or Germany	49%	45%	US, Mx	US, Germany
2 Dodge Journey/FCA/Toluca, Mexico	25%	69%	US	US	0	0	0	0
3 Jeep Compass/FCA/Toluca, Mexico	23%	68%	Mx	US o Japan	20%	69%	Mx o US	Japan o Italy
FORD								
4 Ford Fusion/ Hermosillo, Mexico	26%	55%	Mx o UK	US 2.7 L Spain	0	0	0	0
5 Lincoln MKZ/FORD/Hermosillo, Mexico	25%	60%	Spain o	US	0	0	0	0
6 Mustang Match.SUV, Cuautitlán, México.	0%	0%	0	0	15%	70%	Mx	Mx
7 Bronco Sport, SUV, Hermosillo, Mexico.	0%	0%	0	0	10%	80%	Spain	Mx o US
GM								
8 Chevrolet Blazer/GM/Ramos Arizpe, Mexico	52%	21%	US	US	49%	25%	US	US
9 Chevrolet Equinox/GM/Ramos Arizpe, Mexico	47%	29%	US	US	38%	40%	US	US
10 Chevrolet Equinox/GM/Silao, Mexico	47%	29%	US	US	38%	40%	US	US
11 GMC Terrain/GM/San Luis Potosi, Mexico	47%	29%	US	US	38%	40%	US	US
12 Chevrolet Silverado/Cheymne/GM/Silao, Mexico	46%	38%	US	US	46%	38%	US	US
13 GMC Sierra/GM/Silao, Mexico	46%	38%	US	US	46%	38%	US	US
NISSAN								
14 Nissan Versa/ Aguascalientes, Mexico	20%	60%	US	Mx o Spain	15%	70%	Mx	Mx
15 Nissan Kicks/ Aguascalientes, Mexico	20%	60%	US	Mx	15%	70%	Mx	Mx
16 Nissan NV 200 cargo/ Cuernavaca, Mexico. Light truck	20%	65%	Japan	Mx	20%	60%	Mx	Mx
Mazda								
17 Mazda2 /Mazda/Salamanca, Mexico	0	0	0	0	5%	70%	Mx	Japan
18 Mazda3/Mazda/Salamanca, México	5%	70%	Mx	Thailand	5%	65%	Mx	Thailand
AUDI								
19 Audi Q5/Audi/San José Chiapa, México	3%	77%	Mx	Germany	2%	76%	Mx	Germany

Source: elaborated with data from AAPC (2020). Listings of passenger motor vehicles that are labeled with their U.S. / Canadian parts content AAPC (2020). American Automotive Labeling Act (AALA), <http://www.americanautocouncil.org/domestic-content>. Note: this information does not consider the labor value content or the regional value content of steel and aluminum.

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Table 4 presents 22 cars manufactured in Mexico and sold in the USA market in 2020 and 2021.

All of them had an RVC lower than that required by the RoO when the agreement came into force.

These companies are German or Asian, and it is noticeable that by 2021 they reported a slightly lower RVC (3.6%). Some automakers are not adjusting to new changes yet, and these vehicles may stop selling in the USA. Still, by 2020 they only had to comply with an RVC of 69%.

German companies held the lowest RVC, Volkswagen's Golf contained only 36% RVC, and its engine came from Brazil, Germany, or Mexico. After 38 years, the company will stop Golf production for the USA market and replace it with the SUV, Taos (EFE, 2021). However, the Jetta sedan and the Tiguan SUV will continue production and exports to the USA market. Hence, Volkswagen announced changes in the origin of core auto parts for 2022, and engines will be manufactured in Guanajuato. VW applied last January for an Alternative Transitional Regime (RTA) in order to have more time to comply with the new rules.

The German premium brands Audi, Mercedes, and BMW already control 90% of the market in North America (Covarrubias, 2021). However, Mercedes Benz will stop producing the Sedan A220 in North America, which had 53% of RVC. Still, the company will maintain the GLB 250 SUV production, which has a 45% RVC produced in Mexico and the USA (García, 2020). The BMW 3 Series, built at the San Luis Potosí facility, only had 35% RVC. In 2020 the carmaker manufactured 24 thousand cars in Mexico, and exports began to Japan, Russia, Australia, and Germany, so a budding sales diversification strategy is observed.

Toyota exports to the US the Tacoma truck, manufactured in Baja California and Guanajuato. This truck has an RVC of 55% and was not modified by 2021.

Hyundai-Kia exported four models with an average RVC of 60% in 2019 (Hyundai Stringer, Accent, Kia Forte, Kia Rio); the Stringer ended sales in the US market in 2020. These cars have engines and transmissions made in Mexico, but the share of RVCs from the US and Canada is less than five percent for the Accent and the Forte models and zero for the Rio. Therefore, these models may need to be replaced. Kia applied to an Alternative Transitional Regime (RTA) in order to have five more years to comply with the new rules.

Mazda-Cx30 only needs a small change; it has 70% RVC, and the engine is built in Mexico, but the transmission is from Thailand. Nissan manufactures five models in Mexico for the US market, and two of them were non-RVC compliant in 2019. However, the company is actively making adjustments to meet the rules: the Sentra increased from 70 to 75% RVC, and the Infinity QX50 rose from 60 to 65% RVC. This SUV has a Japanese engine that needs to be replaced. GM's Chevrolet Trax, which has 68% RVC plus a German engine ended sales in the US market in 2020.

In short, it was found that: i) German and Asian automakers were the most affected by RoO, which imposed barriers for companies and countries not only outside the economic block but also within the block, affecting company competitiveness. ii) There was a slight drop in average RVC of German and Asian cars. This is striking as an increase in CVR was expected iii) cars made in Mexico have higher RVC from Mexico (52.70%) than from the USA and Canada together (24.17%) iv) all engines from GM are manufactured in the US while all the engines from Nissan and Hyundai-Kia, are made in Mexico v) Mercedes Benz and BMW engines and transmissions came from Germany. Therefore these two premium brands will probably keep manufacturing in México and pay duties when exporting to the USA.

Table 4. Vehicles produced in Mexico and sold in the United States in 2020 and 2021, that do not comply with the rule of origin (75% of regional value content)									
Brands and models manufactured in Mexico and exported to US in 2020	2020				2021				
	Percent content US Canada	Percent content Mexico	Source of vehicle's engine	Source of vehicle's transmission	Percent content US Canada	Percent content Mexico	Source of vehicle's engine	Source of vehicle's transmission	
GM									
1 GM, Chevrolet, Trax/San Luis Potosi, Mexico	14%	54%	0	US	0	0	0	0	
HYUNDAI/KIA									
2 Hyundai Accent/Nuevo León, México	5%	55%	Mx	Korea o Mx	5%	55%	Mx	Korea o Mx	
3 Kia Forte/KIA/Nuevo León, México	5%	65%	Mx	Mx	5%	60%	Mx	Mx	
4 Kia Rio/KIA/Nuevo León, México	0%	55%	Mx	Mx	5%	50%	Mx	Mx	
5 Kia Stinger/ Nuevo León, México	0%	55%	Mx	Mx	0%	0	0	0	
MAZDA									
6 Mazda Cx30	0	0	0	0	5%	65%	Mx	Thailand	
Mercedes Benz USA									
7 A. class Sedán, (A220;A220-414)/Aguascalientes, México	7%	46%	Germany	Germany	4%	37%	Germany	Germany	
8 GLB SUV (GLB 250/GLB 250 4M)/Aguascalientes, México	5%	40%	Germany	Germany	5%	40%	Germany	Germany	
NISSAN									
9 Nissan Sentra /Aguascalientes, México	10%	60%	US	Mx	15%	60%	Mx	Mx	
COMPAS /NISSAN									
10 Infiniti QX50/NISSAN/COMPAS/ Aguascalientes, Mexico	15%	45%	Japan	Mx	10%	55%	Japan	Mx	
TOYOTA									
11 Toyota Tacoma/Toyota/Guanajuato, México	55%	0	US and Japan	US and Japan	55%	0	US and Japan	US and Japan	
12 Toyota Tacoma/Toyota/Tijuana, México	55%	0	US	US	55%	0	US	US	
VOLKSWAGEN									
13 Volkswagen Golf/GTI/Puebla, México	10%	27%	México	Germany	10%	27%	México	Germany	
14 Volkswagen Golf/ Puebla, México	8%	27%	Brazil	Germany	8%	27%	Brazil	Japón	
15 Volkswagen Jetta/ Puebla, México	6%	32%	Brazil	Japón	6%	32%	Brazil	Japón	
16 Volkswagen Jetta/ GLI/ Puebla, México	5%	33%	Mx	Germany	5%	33%	Mx	Germany	
17 Volkswagen Jetta / GLI/Puebla, México	6%	35%	Mx	Germany	6%	35%	Mx	Germany	
18 Volkswagen Jetta/ Puebla, México	4%	34%	Brazil	Germany	4%	34%	Brazil	Germany	
19 Volkswagen Tiguan/ Puebla, México	7%	41%	Mx	Japan	7%	37%	Mx	Japan	
20 Volkswagen Tiguan /Puebla, México	10%	35%	Mx	Japan Germany	7%	35%	Mx	Japan	
AUDI									
21 Audi Q5 PHEV/ San Jose Chiapa, Mex	2%	46%	Hungary	Germany	2%	48%	Hungary	Germany	
22 Audi SQ/ San Jose Chiapa, Mexico	3%	63%	Hungary	Hungary	2%	61%	Hungary	Hungary	
BMW									
23 BMW, San Luis Potosi, 330 E Sedan	0	0	0	0	10%	25%	Germany	Germany	
24 3 Series Sedan PC, San Luis, Potosi,	0	0	0	0	10%	25%	Germany	Germany	
HONDA									
25 HONDA, HR-V-FWD, Mpv, Celaya, Me	0	0	0	0	20%	40%	USA	Mx	
26 H-R-V-AWD, Celaya, Mexico	0	0	0	0	20%	35%	USA	India	
Source: elaborated with data from AAPC (2020). Listings of passenger motor vehicles that are labeled with their U.S / Canadian parts content AAPC (2020). American Automotive Labeling Act (AALA), http://www.americanautocouncil.org/domestic-content . Note: this information does not consider the labor value content or the regional value content of steel and aluminum.									

b) Regional value content for auto parts

There are three types of auto parts in the new agreement: Core, Principal, and Complementary, together they reach sales for 294,860 million USD that represent 11.55% of the total imports in the UMSCA region in 2020.

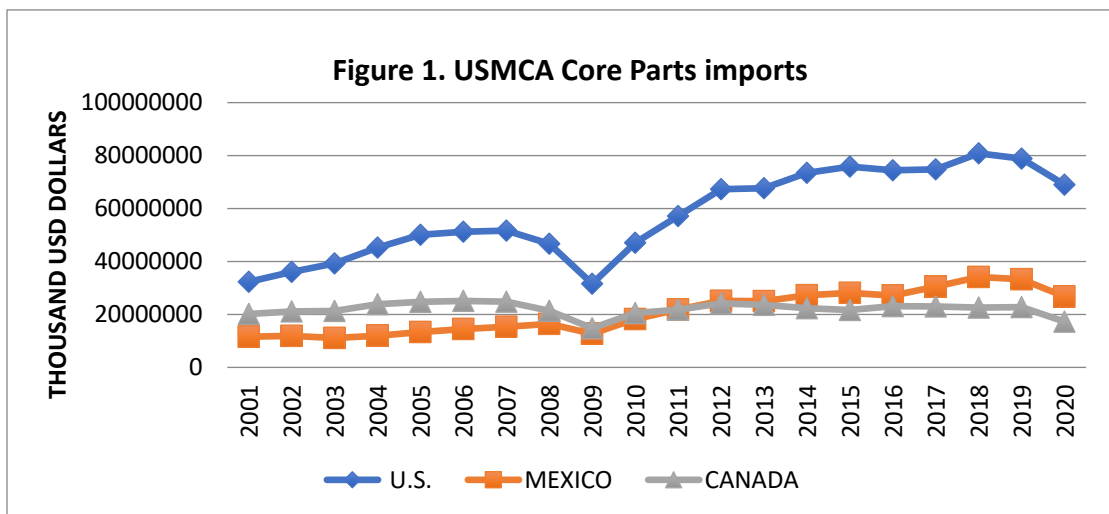
Core parts for passenger vehicles and light trucks (Figure 1). The RVC requirement for Core parts is 75% under the net cost method and 85% under the transaction cost method⁸. Core parts are about 40% of vehicle cost. These are seven: engines, transmissions, body and chassis, axles, suspension systems, steering systems, and advanced batteries. Core parts must be manufactured in the region to be considered original; Rubinstein and Klier (2019), point out that most of core parts installed in vehicles manufactured in North America are produced by the automakers or by their Tier 1 suppliers in facilities located within the USMCA region. Therefore, companies may not expect a significant impact, except for some transmissions of German and Asian carmakers and several of the motors that are produced out of the region (table 5).

One of the purposes of RoO is to decrease region core-part imports, which grew an AAGR of 4.03% in 20 years. In 2020, the region imported 113,000 million USD or 16.2% less than the previous year; most of the imports (61%) are made by the USA. The drop in imports is a world trend that began in 2019 and grew during the COVID19 crisis. However, it is not yet possible to

8. RVC can be calculated applying the net cost method, and its compliance is gradual, reaching the total in three years as follows: 66 %in 2020, 69 %in 2021, 72 %in 2022, and 75 %in 2023 (DOF, 2020, p.209). If RVC is calculated under the transaction value method it is 85 percent, and its compliance is gradual to reach the total in 3 years from the entry into force of the trade agreement: 76 %in 2020, 79 %in 2021, 82 %in 2022, and 85 %in 2023.

identify whether the fall in imports is the beginning of the expected trend related to USMCA (Figure 1).

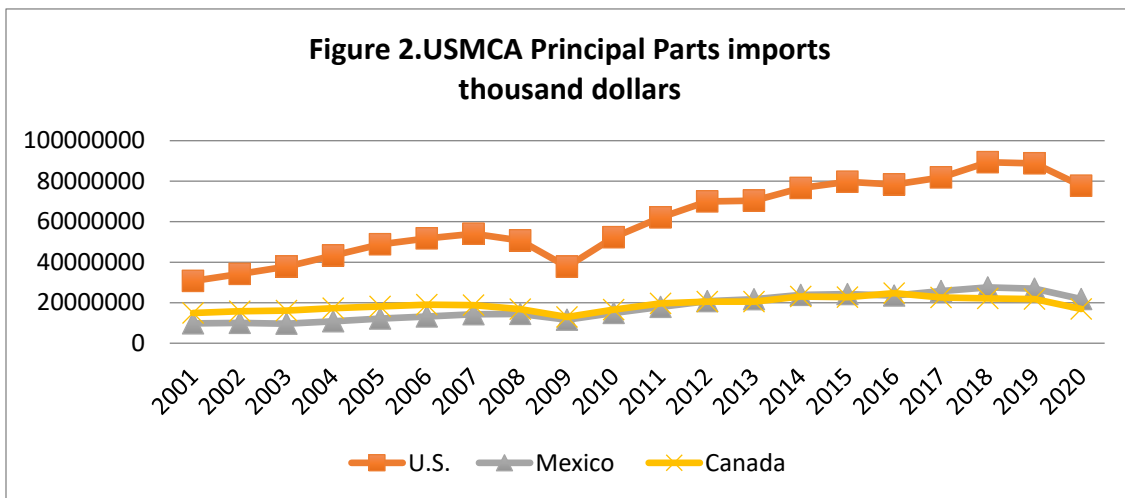
Core parts include 17 tariff items⁹, where heading 850760: “Lithium-ion accumulators” is remarkable as it grew at an AAGR of 20% between 2012 and 2020. USMCA region imports 14.8% of total world imports of Lithium-ion accumulators, and the USA imported \$2,099 million USD from China, which represents half of these imports. The agreement requires advanced batteries to be original and this rule is intended to incentivize new investments in the USA or Canada. Arteaga, Marcial, and Ortiz (2021) argue that the agreement tries to increase the competitiveness of the industry vis-à-vis China and restrict its presence in the USA market. They supposed that competition forced a VCR increase in the most dynamic parts segments to contain China.



Source. Elaborated with Trade Map Data Base. Table A.1 Core parts for passenger vehicles and light trucks, 17 tariff items. USMCA agreement.

9. See the Table A.1 from the USMCA agreement.

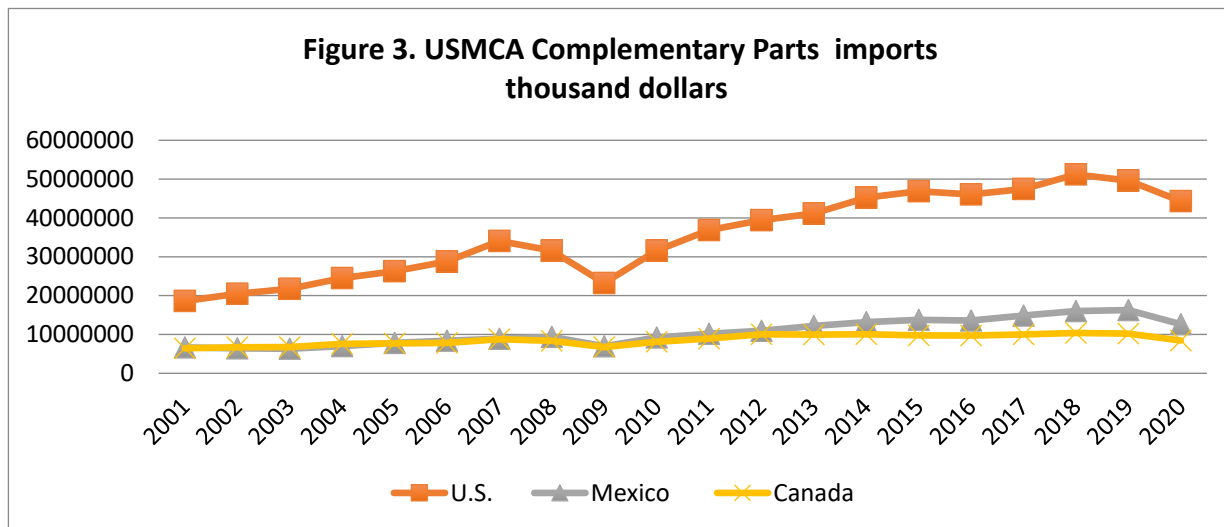
Principal parts for passenger vehicles and light trucks (Figure 2). The RVC requirement for Principal parts is 70% as estimated by the net cost method or 80% if the transaction value method is applied¹⁰. Principal parts imports grew up at an AAGR of 4.6% in 20 years. However, in 2020, the region imported 116,450 million USD, 15.3% less than the previous year because of the Covid19 crisis. Most of the imports are made by USA (66.7%) and Mexico (18.7%). Principal parts include 38 tariff items (DOF, 2020, p.219). Two tariff items stand out, which together represent 34% of total imports: The heading 870829 "Other parts and accessories of bodies, including cabs of motor vehicles (excluding body stampings)" which imported 21,318 million USD. Then, heading 870899 "Other parts and accessories of motor vehicles of headings 87.01 to 87.05 (excluding chassis frames)" imported 18,382 million USD.



Source: elaborated with trade map database Table B. Principal parts for passenger vehicles and light trucks 38 tariff items. USMCA agreement.

10. The RVC requirement for Principal parts is 70% applying the net cost method, and its compliance is gradual to reach the total in three years: 62.5% in 2020, 65% in 2021, 65.7% in 2022, 70% in 2023. If the transaction value method is applied, RVC is 80 percent, and the compliance is gradual to reach the total in three years: 72.5% in 2020, 75% in 2021, 77.5% in 2022, and 80% in 2023.

Complementary parts for passenger vehicles and light trucks (figure 3). The RVC requirement for these parts is 65% applying the net cost method, and 75% applying the transaction value method¹¹. Imports of these parts grew at an AAGR of 4.5% in 20 years. In 2020, the region imported 65,409 million USD or 14.08% less than the previous year, because of the drop in production related with the Covid19 crisis, and USA imported 67.7% of the total. Complementary parts include 27 tariff items (DOF, 2020, p. 221). The heading 854430, “Ignition wiring sets and other wiring sets of a kind used in motor vehicles” and the heading 842139, “Catalytic converters” together represent 26% of the total. However, this trade is mainly intraregional from Mexico to the USA.



Source: elaborated with trade map database. Table C Complementary parts for passenger vehicles and light trucks, 27 tariff items. USMCA agreement.

11. The RVC for complementary parts is 65 %its compliance is gradual to reach the total in three years: 62 %in 2020, 63 %in 2021, 64 %in 2022, 65 %in 2023. If the transaction value method is applied, RVC is 75 percent, and compliance is: 72 %in 2020, 73 %in 2021, 74 %in 2022, and 75 %in 2023.

In the case of automakers cannot comply with new RoO, but they comply with NAFTA's rules (62.5% of RVC) they may pay the most-favored-nation rate that will not exceed 2.5% for light vehicles and 25% for light trucks, limited to a total of 1 million 600 thousand units (DOF, 2020, p. 48). However there are still many doubts to be resolved. On August 20, 2021, Mexico requested a formal consultation with the United States. It is a non-contentious stage of a dispute resolution mechanism provided for in Chapter 31 of the Agreement. The interpretation of calculating the RVC of auto parts and later adding to the overall car's RVC is in dispute. These kinds of problems may wear down the industry and increase transaction costs (Automotive News, 2021).

The regional labor value content (RLVC)

The regional labor value content (RLVC) requirements for vehicles did not exist under NAFTA. Now for a passenger vehicle to be considered originating, it is necessary to certify workers who received at least 16 dollars per hour made that 40% of the net cost of the vehicle.

The RLVC is made up of three dispositions (DOF, 2020, p. 213). Twenty-five percent will be accredited for high salaries related to materials or manufacturing. Its compliance is gradual to reach the total in 3 years from the entry into force of the trade agreement: 15% by 2020, 18% by 2021, 21% by 2022, and 25% by 2023 (DOF, 2020, p. 213). Ten percent more, will be accredited for high salaries related to research and development and information technology, and five percent will be certified for high wages related to the assembly. Compliance is mandatory as of the entry into force of the trade agreement. Five percent of assembly salaries are considered as

long as the plants have the capacity for 100,000 motors, 100,000 transmissions, or 25,000 lithium batteries.

Initially, it was thought that renegotiation of the treaty would lead to higher wages; however, in the end, the work of the Mexican labor force was reduced to participating only in 60% of the total value of the automobile. This rule may increase employment in the USA and Canada. However, it will hardly improve stagnant wages in the USMCA region because 16 USD an hour is below the average hourly wage paid by the auto industry in these countries.

Chapter 23 of the USMCA free trade agreement (DOF, 2020, p. 496) seeks a fairer treatment for workers. It aims to prevent partner countries from renouncing to properly apply labor laws that protect their workers in order to attract more investment or increase trade: this problem has already happened in Mexico. The trade agreement also promotes the commitment to comply with the Declaration on Rights at Work and the Declaration on Social Justice for a Fair Globalization of the International Labor organization (ILO). It also eliminates all forms of forced or compulsory labor, including child labor. It obliges all three-partner countries to comply with acceptable working conditions regarding hours, occupational safety and health, and minimum wages. Obligations include complying with the labor laws of each country to provide benefit payments such as profit sharing, bonuses, retirement, and health care, eliminating discrimination in employment, and promoting equality for women at work (DOF, 2020, p. 497). Workers and unions must be able to exercise their rights free from violence and threats. Independent institutions for conciliation, union registration, collective bargaining agreements, and labor courts must be guaranteed (DOF, 2020, p. 504).

Monitoring compliance with article 23 will be the function of Labor Council overseeing rules and procedures specified in the same agreement. Besides, the USMCA Implementation Law, section 731, states, "the United States Congress will establish the Independent Board of Labor Experts of Mexico for monitoring and evaluating the implementation of labor reform" (IMLEB, 2020, p. 1).

The Mexican government has taken advantage of the commitments made in the Agreement and promoted labor reforms pending for a long time. As a result, changes to the National Labor Law promulgated in May 2019 include i) gradual replacement of the functions of the Conciliation and Arbitration Boards by labor courts hoping to decrease resolution delays ii) the creation of a Federal Center for Conciliation and Labor Registration to register unions and deposit collective agreements in Mexico iii) establishment of new mechanisms to guarantee freedom of association. The previous labor law regulated association freedom but was never enforced (Ministry of Labor and Social Security, 2019). Of note are the rules prohibiting "Covering up an employment relationship with simulated legal acts to avoid compliance with labor and with social security obligations, and also registering a worker with a lower salary than he receives " that are widespread practices in Mexico.

There is also confusion about how to calculate this content. The private initiative indicated that the agreement has some flexibility in its application since RLVC will be calculated for the entire corporation, adding the results of the different facilities in each of the three partner countries.

d) Regional value content for Steel and Aluminum

The agreement states that “a passenger vehicle, light truck, or heavy truck, is originating in the region if, during the fiscal year or calendar year before export or export quarter, at least 70% of corporate purchases of steel or aluminum, in value, was made in the USMCA region” (DOF, 2020, p. 213). This rule of origin will only have to be reported by carmakers as they purchase large quantities of steel annually for themselves and for their suppliers to achieve lower prices per ton of steel.

The trade agreement also states that after the seventh year, the steel purchased must have been melted and processed in the USMCA region (INA, 2020). This rule affects companies that import steel from Asian or European countries. It will favor only the United States and Canada because Mexico does not produce steel for the automotive industry. Similarly, the RVC requirement for aluminum may favor Canada and the United States, which occupy the fourth and ninth places in world production (Statista, 2020). Again, Mexico imports bauxite, as its aluminum production is limited.

Finally, USMCA presents some options to help in the transition. Ten percent of the total annual production of passenger vehicles or light trucks of a company is eligible for a transition period that ends five years after the entry into force of USMCA, as long as they comply with the following: a) 62.5% automobile RVC b) 62.5% RVC core parts c) steel and aluminum RVC requirement shall be fully met unless all three countries agree to modify it and d) RLVC cannot be reduced by more than five percentage points for high salaries in materials and manufacturing expenses, unless the three countries agree to modify it (DOF, 2020, p.215).

Conclusions

It may be predicted that companies will comply heterogeneously with the new rules of the agreement depending on their product strategies, how far they are from meet the new RVC threshold, and the imposed tariff. We found that product strategies and the problem of meeting the new RVC are essential factors.

The impact was not the same for carmakers in Mexico: Ford, GM, and FCA were favored with the increase in the RVC because most of the vehicles that they manufacture in Mexico and sell in the USA were already built with parts made in the area; also, there were three NISSAN vehicle models in the same circumstances. The Mazda 3 and The Audi Q5 comply with the RVC, although transmissions came from Japan, Thailand, and Germany.

German and Asian automakers were the most affected by the RoO. Twenty-two of their vehicles had an RVC lower than required when the agreement came into force. One year later, they reported a slightly lower RVC in some cars, so these automakers are not adjusting to new rules and some of these vehicles may not be brought into compliance ending sales in the USA

Premium brands follow a quality and niche strategy, and they are not abiding by these rules. As a result, the carmaker may decide that it is costly or lose quality to substitute suppliers of core auto parts and choose to pay the duty, more so if the vehicle has a very low RVC. BMW, Mercedes Benz, and Audi are in this case as their engines and transmissions come from Hungary and Germany. Therefore, paying a 2.5% tariff rate and increasing the car's price may be an option for this segment. Also, BMW already sows a market diversification strategy.

Companies with strategies based on economies of scale or emphasis on cost reduction will seek to comply with the rule of origin, especially if they are close to the RVC threshold. The Mazda 2, the Honda HR-V, and the NISSAN Sentra, and the QX50 of its luxury brand Infinity, Toyota Tacoma, and Hyundai-Kia will probably choose to comply.

Volkswagen had the lowest RVC, and the company is pursuing a mixed strategy: on one hand, it ended the production of some products such as the Golf for the USA market, and on the other hand, it kept the SUVs. It also announced engines will be manufactured at the Guanajuato, Mexico facilities.

Cars made in Mexico have a higher RVC average from Mexico (52.70%) than from the USA and Canada (24.17%): this could help comply with the RLVC, limiting Mexican labor's value to 60% of the value of the car. In addition, all GM engines are manufactured in the USA, while all Nissan and Hyundai-Kia are made in Mexico.

FTA is increasing transaction costs because of the burdensome of applying RoO. The rules are already causing controversy, and it will take more time for results to be observed. For now, some automakers have applied for an Alternative Transitional Regime.

Inexpensive labor is a widely known location factor and will change in Mexico. The new government increased the stagnant minimum wage for three years in a row and installed a new labor regulation along with mandatory mechanisms. Chapter 23 of the free trade agreement may help improve conditions of workers, especially for multinationals that export within the USMCA region, since a commission will supervise companies to avoid non-compliance with labor laws.

The RVC requirement for steel and aluminum favors the United States and Canada. At the same time, Mexico is not affected as it does not produce steel for the automotive industry, and aluminum production is limited.

We analyze changes in imports of the three groups of auto parts regulated that represent 11.55% of the total imports of the UMSCA region in 2020. Five elements stand out: the "Lithium accumulators," mostly imported from China, the leading producer in the world. It is crucial because the industry's future is electromobility that depends on Lithium batteries. Therefore, this new technology must be produced in the region to ensure competitiveness.

By 2020 there is a general decline in production, regional trade, foreign direct investment, and employment related to the COVID19 crisis that complicates the interpretation of changes since the Agreement's entry into force.

Finally, changes will only affect companies located in the USMCA region, taking advantage of the free trade agreement. Reasons to manufacture in Mexico and export to other countries or regions still will be inexpensive skilled labor, trade agreements with other countries, government support for industry, agglomeration advantages, and a devalued currency. However, lessons learned from this process lead to insist on giving greater importance to manufacturing in Mexico. It is necessary to substitute inexpensive labor and a devalued currency as the main reason to manufacture in the Country. Mexico must implement an industrial policy that inserts the Country into the wave of technological change and be aware of the possibility that an import substitution process may be very favorable.

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