

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 Tratado México-Estados Unidos-Canadá (T-MEC) sobre 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, to understand the dynamics of change and protectionism, the author explores possible adjustments in light vehicle production, variations in the imports of regulated auto parts, and changes in labor regulation, and analyzes the regional value content (RVC) reported for each car assembled in Mexico and sold in the U.S. in 2020 and 2021. She uses a trade database to analyze changes in imports of the groups of regulated auto parts to determine growth trends. Companies comply heterogeneously with the new rules of the agreement depending on their product strategies, how far they are from meeting the new RVC threshold, and the tariff levied. Rules of origin affected German and Asian automakers producing in Mexico more than their competitors; however, they underwent fewer adaptive changes.

Key words: 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 Tratado México-Estados Unidos-Canadá (T-MEC) sobre 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 (*regional value content*, RVC) informado para cada automóvil ensamblado en México y vendido en Estados Unidos 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 tratado en función de sus estrategias de producto, de cuán 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 adaptados.

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 (ICTS) are impacting manufacturing, and vehicles are becoming autonomous, connected, electric, and shared (ACES). Regulation is promoting green electric cars, and a social trend has emerged to share vehicles instead of buying them. In addition, coronavirus disease (COVID-19) caused a global economic crisis leading to plant closures for months, affecting sales, production, and profits, and breaking global value chains.

The automotive industry in North America also faces other challenges due to the July 2020 entry into force of the United States-Mexico-Canada Agreement (USMCA), which introduced four critical new rules of origin (ROO) for the automotive industry: (a) increase of regional value content (RVC) requirement for vehicles; (b) a hike in the auto parts RVC depending on their classification (core, principal, and complementary); (c) a first-time regional labor value content (RLVC); and, (d) an RVC for steel and aluminum.

According to the United States International Trade Commission (USITC, 2019: 85), these changes will increase production of parts and employment in the U.S. 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 (INA, 2020). However, these assertions may oversimplify the possible consequences of the industry's new ROO. At this moment, the interpretation of how to calculate the parts' RVC, later added to the car's overall RVC, is in dispute among the partner countries.

The USMCA went into effect a year ago, and studies analyzing the effects are scarce. In this article, I investigate how the new ROO are impacting the automotive industry in Mexico, paying particular attention to explaining how specific car models are affected. Since governments assumed that the agreement would favor parts import substitution, I analyze regulated parts trade trajectories. This article proposes that the companies' response to the new USMCA rules will be heterogeneous, depending on their product strategies, how far they are from meeting the new RVC threshold, and the tariff imposed.

Analysis of specialized literature allowed me to reconstruct industry participation in globalization and regionalization processes. I developed a theoretical framework on localization factors and free trade in order to characterize ROO, and explain companies' responses. 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.

The article is organized in four sections: (a) a description of auto industry globalization and regionalization processes along with some conceptual background 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 the USMCA; (c) implementation of the new ROO and changes observed in the first year under the USMCA; and (d) discussion of the data 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 twenty 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) increased.¹ The economic blocs of the European Union (EU), the Asia-Pacific Basin, and North America consolidated; high- and low-cost countries were integrated, benefitting from comparative advantages; for example, 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 (Curran and Eckhardt, 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 this was 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's accounted for more than half their world output, and,

¹ There has been steady growth in regional trade agreements (RTAs). In 1990 there were twenty-two and by 1995, their numbers had doubled (47); in 2020 they had grown 6.5 times (310), and by 2021 RTAs reached 350 (WTO, 2021).

adding Mercosur, the Association of Southeast Asian Nations (ASEAN),² and the Commonwealth of Independent States (CIS),³ it reached 70 percent (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 percent. Even adding Mercosur, ASEAN, and CIS, production reached only 46 percent, losing 30 percentage points in twenty-eight years (OICA, 2021). The decrease was due to China's participation, which increased from 5 percent to 32.5 percent in twenty years.

Freyssenet (2017) points out that market globalization and harmonization of automobile demand never occurred. On the contrary, globalization generated different "growth modes" and income distribution.⁴ Thus, carmakers had to keep using differentiated strategies and failed to reduce the number of platforms worldwide. Even without market globalization, the industry increased its internationalization: between 1990 and 2005, its transnational index (TNI) rose from 36 percent to 56 percent, approaching the world industrial average of 60 percent (Jetín, 2017). Regional automotive production is the dominant pattern; however, globalization transformed the industry by promoting a highly complex inter-regional value chain with flows of intermediate goods, information, knowledge, and money between geographical production spaces (Sturgeon et al., 2010).

De Gortari points out that "in GVC [global value chains], intermediate input suppliers produce specialized inputs that are only compatible with specific subsequent uses, and manufacturing companies in Mexico that export to the U.S. use relatively more U.S. inputs than those exporting to other destinations" (2017: 1). He estimates that the automotive industry's integration in the two countries is so deep that the U.S. accounts for 74 percent of foreign inputs embedded in vehicles assembled in Mexico and sold in the U.S. market. In contrast, the U.S. accounts for only 18 percent of the inputs embedded in a car built in Mexico and sold on the German market.

Published studies on determinants of manufacturing and FDI are plentiful. Still, determinants like access and market size, GDP, GDP per capita, and cost factors have been consistently mentioned over time and also fulfilled in USMCA. Labor issues such as low wages, the number of skilled and unskilled employees, and the number of engineers are also widely mentioned (Hurley, 1959; Dunning, 1998). Also analyzed are agglomerative spatial economies and local service (Dunning, 1980; 1998), transaction costs (Williamson, 1979), strategies in the automotive value-added chain (Sturgeon et al., 2010), infrastructure development and regional innovation capabilities (Csíki,

² ASEAN (Indonesia, Malaysia, Myanmar, Philippines, Thailand and Vietnam).

³ CIS (Russia, Azerbaijan, Belarus, Kazakhstan, Ukraine, Uzbekistan).

⁴ "Growth modes areas [were] 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 Freyssenet, 2002).

Horvath, and Szász, 2019). I focus on free trade agreements and ROO that influence investment location and supply-source decisions.

Free trade agreements (FTAs) help partner countries 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 size or allowing access to a population with higher per capita GDP (Dunning, 1980; 1998; Sturgeon et al., 2010). Reinsch et al. (2019) indicate that FTAs have contributed to configure global value chains by favoring industry linkages and protecting producers from rivals external to the region. However, FTA ROO define features of a product to be considered originating in a region in order to receive preferential treatment and may not always benefit GVCs. ROO impose barriers for companies and countries outside the economic bloc 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 them.

Strict rules may force companies with low-cost sources of supply outside of FTAs 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. ROO may support protectionist goals for inputs and final products in the region. Governments can use them to encourage investment and create well-paying jobs (Estevadeordal and Suominen, 2003).

BACKGROUND OF THE USMCA FREE TRADE AGREEMENT

The automotive sector has existed for more than ninety years in Mexico, contributes 3.8 percent to national GDP and 20.2 percent to manufacturing GDP, generates 1.8 million jobs, manufactured 3.9 million vehicles in 2019, and is the world's seventh-largest vehicle producer (AMIA-INEGI, 2018). The sector has twenty-two complete car assembly plants, more than 2,000 suppliers, and thirteen private engineering and design centers. This explains the concern of developed countries about the relocation of design services and research and development.

Auto industry results in Mexico after twenty years of NAFTA have been controversial. Benefits include increased production, contribution to total and manufacturing GDP, and job creation. However, the pull to grow other industries, to integrate national suppliers in global value chains, and to raise research and development capacities have been insufficient (Álvarez, 2014).

Automotive industry growth in Mexico is explained by drivers-of-location decisions of 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 to the U.S. market, government support to attract foreign investment, agglomerative spatial economies, local services, and a devalued currency that decreased production costs. Infrastructure problems still exist, such as limited natural gas and high prices for electricity supply (Álvarez and González, 2015; Álvarez and Carrillo, 2017; Dussel-Peters and Gallagher, 2013; Covarrubias, 2019; Martínez and Carrillo, 2019; Klier, 2019).

a) Production. NAFTA's total car production grew 18.4 percent between 1994 and 2019 (see Table 1). Still, the U.S. 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 U.S. In 2020, regional production fell 20 percent due to the COVID-19 crisis; Canada was the most affected, falling eleven percentage points under the region's mean.

Table 1
PRODUCTION OF LIGHT CARS IN THE NAFTA REGION
(1994-2020)

	Millions of vehicles							% Change
	1994*	2000	2005	2009	2015	2019	2020	2019/2020
U.S.	11.07	12.7	11.9	5.7	12.1	10.8	8.8	18.50
Mexico	0.9	1.9	1.6	1.5	3.5	3.9	3.1	20.51
Canada	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

* Prepared with information from Carbajal and Del Moral (2014).
Source: Developed with data from OICA (2021).

b) Foreign direct investment (FDI). Investment in the automotive industry has been substantial, and the U.S. has received much greater investment flows than its two trading partners. Between 2010 and 2016, carmakers invested US\$80.7 billion in the U.S. and only US\$25.8 billion in Mexico, while part suppliers invested US\$44.4 billion in the United States, US\$3.4 billion in Mexico (CEPAL, 2017: 174). In 2019, FDI in the automotive sector in Mexico reached US\$7.463 billion or 21.9 percent of the total. However, by 2020 it showed a

- significant decrease in car manufacturing (13.8 percent) and parts (55.9 percent), since investments stopped worldwide due to the fall in sales during the COVID-19 crisis.
- c) Regional trade. Regional trade increased in the NAFTA years, and the total trade balance of the U.S. with Mexico changed from a surplus of US\$1.349 billion in 1994 to a deficit of US\$101.4 billion in 2019. In the same way, the deficit with Canada increased from US\$13.967 billion to US\$26.794 billion. Most of the deficit *vis-à-vis* Mexico is related to the automotive industry. The COVID-19 crisis affected trade in 2020, and automobile and part imports in the region dropped 19.83 percent, while exports decreased 20.95 percent (Trade Map, 2020).
- d) Restructuring of production. During the 2008 economic-financial crisis, North American output decreased 32.4 percent, dropping from 12.9 to 8.7 million vehicles. The restructuring involved moving facilities, adjusting production, and replacing models. In addition, the U.S. and Canada closed plants. Between 2007 and 2011, fifteen facilities in the U.S. 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 412,000 automobiles. By 2015, the U.S. had recovered its production levels due to Japanese and German automakers (Álvarez and 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 labor costs. 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, subcontracting, and changing benefits in collective contracts; and union influence declined (González, 2015). In the U.S., the number of employees and automakers' wages decreased while productivity increased: employment decreased 70 percent between 2000 and 2012. The average hourly wage fell from US\$21.68 to US\$21.29, and labor productivity increased from 10.77 to 13.36 vehicles per employee (Alvarez and González, 2015). In Mexico, "employment increased from 112,000 to 767,000 in 2016; the average hourly wage remained at US\$3.14; and productivity rose 76 percent from 2007 to 2015" (Covarrubias, 2019: 103). In addition, 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 percent, decreasing from 100,000 to 98,000 jobs; and auto parts employment dropped 6 percent, falling from 841,000 to 789,000 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 and 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 FOR LIGHT VEHICLES AND THE FIRST IMPACTS

The USMCA trade agreement imposed 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 percent for light vehicles to 25 percent for light trucks, carmakers must meet the mandatory RVC and, if necessary, reconfigure the region's models and range of cars traded.

Regional Value Content for Light Vehicles

The RVC required on passenger vehicles and light trucks increased from 62.5 percent in NAFTA to 75 percent in the USMCA as calculated by the net cost method (see Table 2).^{5,6}

Compliance is gradual for reaching the total in three years from the entry into force of the trade agreement: 66 percent in 2020, 69 percent in 2021, 72 percent in 2022, and 75 percent in 2023 (DOF, 2020: 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 U.S. proposes is more challenging for reaching the mandatory content.

Impact of the Regional Value Content Rules On Vehicle Production in Mexico

I reviewed the regional content of each vehicle manufactured in Mexico and sold in the U.S. and observed two groups: cars that complied with 75 percent of RVC since 2020 (see Table 3) and those that did not comply (see Table 4). Then I compared data

⁵ 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.

⁶ 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 fifteen or fewer persons.

with RVC reported in 2021. Already, one year after the agreement’s entry into force, some changes can be observed.

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, which 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 cars and 45% of the value of light trucks must be produced by workers making more than US\$16/hour
Rules of origin for steel and aluminum	No requirements	70% of corporate steel purchases must be made within the region.
<p>* Net cost method: $RVC = \frac{(NC-VNM)}{NC} \times 100$ 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.”</p> <p>** Transaction value method: $RVC = \frac{(TV-VNM)}{TV} \times 100$ 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.”</p> <p>Source: USMCA Chapter 4 (n.d.).</p>		

The average RVC of cars (see Table 3) increased from 81.13 percent to 82.69 percent between 2020 and 2021. Since the beginning, these vehicles have complied with USMCA rules of origin. In 2021, Ford stands out with 10.5-percent RVC growth, followed by FCA (1.95 percent), Nissan (1.72 percent), and GM (0.7 percent); however, Audi and Mazda show a slight RVC decrease.

Table 3

VEHICLES PRODUCED IN MEXICO AND SOLD IN THE U.S. MARKET IN 2020 AND 2021 THAT COMPLY WITH THE 75% OR MORE RULE FOR REGIONAL CONTENT VALUE

	Brands and models manufactured in Mexico and sold in the U.S. market	RVC 2020				RVC 2021			
		Percent content U.S. Canada	Percent content Mexico	Source of vehicle's engine	Source of vehicle's transmission	Percent content U.S. Canada	Percent content Mexico	Source of vehicle's engine	Source of vehicle's transmission
		FCA							
1	Ram 1500 pickup/FCA/Satillo, Mexico	55	29	U.S., Mx	U.S. or Germany	49	45	U.S., Mx	U.S., Germany
2	Dodge Journey/FCA/Toluca, Mexico	25	69	U.S.	U.S.	0	0	0	0
3	Jeep Compass/FCA/Toluca, Mexico	23	68	Mx	U.S. or Japan	20	69	Mx or U.S.	Japan or Italy
		Ford							
4	Ford Fusion/Hermosillo, Mexico	26	55	Mx or UK	U.S., 2.7 L; Spain, 2.3 L	0	0	0	0
5	Lincoln MKZ/Ford/Hermosillo, Mexico	25	60	Spain or Mx	U.S.	0	0	0	0
6	Mustang Match, suv, Cuautitlan, State of Mexico	0	0	0	0	15	70	Mx	Mx
7	Bronco Sport, suv, Hermosillo, Mexico	0	0	0	0	10	80	Spain	Mx or U.S.
		GM							
8	Chevrolet Blazer/GM/Ramos Arizpe, Mexico	52	21	U.S.	U.S.	49	25	U.S.	U.S.
9	Chevrolet Equinox/GM/Ramos Arizpe, Mexico	47	29	U.S.	U.S.	38	40	U.S.	U.S.

10	Chevrolet Equinox _{GM/Silao, Mexico}	47	29	U.S.	U.S.	38	40	U.S.	U.S.
11	GM Terrain _{GM/San Luis Potosí, Mexico}	47	29	U.S.	U.S.	38	40	U.S.	U.S.
12	Chevrolet Silverado _{Cheyenne/CM/Silao, Mexico}	46	38	U.S.	U.S.	46	38	U.S.	U.S.
13	GM Sierra _{GM/Silao, Mexico}	46	38	U.S.	U.S.	46	38	U.S.	U.S.
				Nissan					
14	Nissan Versa _{Aguascalientes, Mexico}	20	60	U.S.	Mx or Spain	15	70	Mx	Mx
15	Nissan Kicks _{Aguascalientes, Mexico}	20	60	U.S.	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, Mexico}	5	70	Mx	Thailand	5	65	Mx	Thailand
				Audi					
19	Audi Q5 _{Audi/San José Chiapa, Mexico}	3	77	Mx	Germany	2	76%	Mx	Germany

Note: This information does not include the labor value content or the regional value content of steel and aluminum.

Source: Developed 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}.

Three of the four models produced by FCA in Mexico and sold in the U.S. (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 U.S. in 2021.

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

Similarly, five of the six models that GM exports comply with the new RVC: the company kept the same product range with the Chevrolet Blazer, Chevrolet Equinox, GMC Terrain, Chevrolet Silverado, and GM Sierra. Its average RVC increased 0.7 percent from the previous year.

Audi manufactures its Q5 model in Puebla and has a 76-percent RVC. The company makes 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 specially built for the U.S. market.

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

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

Table 4 shows twenty-two cars manufactured in Mexico and sold in the U.S. 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 noteworthy that by 2021 they reported a slightly lower RVC (3.6 percent). Some automakers are not adjusting to the new changes yet, and these vehicles may stop selling in the U.S. Still, by 2020 they only had to comply with a 69-percent RVC.

German companies had the lowest RVC: Volkswagen's Golf contained only 36 percent RVC, and its engine came from Brazil, Germany, or Mexico. After thirty-eight years, the company will stop Golf production for the U.S. market and replace it with the Taos SUV (Efe, 2021). However, the Jetta sedan and the Tiguan SUV will continue production and exports to the U.S. market. Hence, Volkswagen announced changes in the origin of core auto parts for 2022, and engines will be manufactured in Guana-

juato. VW applied last January for an alternative transitional regime (ATR) in order to have more time to comply with the new rules.

The German premium brands Audi, Mercedes, and BMW already control 90 percent of the market in North America (Covarrubias, 2021). However, Mercedes Benz will stop producing the Sedan A220 in North America, which had 53 percent RVC. Still, the company will maintain GLB 250 SUV production, which has a 45-percent RVC produced in Mexico and the U.S. (García, 2020). The BMW 3 Series, built at the San Luis Potosí facility, only had 35 percent RVC. In 2020, the carmaker manufactured 24,000 cars in Mexico, and exports began to Japan, Russia, Australia, and Germany, so a budding sales diversification strategy can be observed.

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

Hyundai-Kia exported four models with an average RVC of 60 percent in 2019 (Hyundai Stringer, Accent, Kia Forte, Kia Rio); the Stringer ended sales in the U.S. market in 2020. These cars' engines and transmissions are made in Mexico, but the share of RVCs from the U.S. and Canada is less than 5 percent for the Accent and the Forte models and 0 percent for the Rio. Therefore, these models may need to be replaced. Kia applied for an alternative transitional regime (ART) in order to have five more years to comply with the new rules.

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

In short, I 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 bloc but also within the bloc, affecting company competitiveness. (ii) There was a slight drop in average RVC of German and Asian cars. This is striking, since an increase in CVR was expected. (iii) Cars made in Mexico have higher RVC from Mexico (52.70 percent) than from the U.S. and Canada together (24.17 percent). (iv) All GM engines are manufactured in the U.S. while all Nissan and Hyundai-Kia engines, are made in Mexico; and v) Mercedes Benz and BMW engines and transmissions came from Germany. Therefore, these two premium brands will probably keep manufacturing in Mexico and pay duties when exporting to the U.S.

Table 4

VEHICLES PRODUCED IN MEXICO AND SOLD IN THE U.S. MARKET IN 2020 AND 2021 THAT DO NOT COMPLY WITH THE RULE OF ORIGIN (75% OF REGIONAL VALUE CONTENT)

	RVC 2020			RVC 2021			
	Percent content U.S. Canada	Percent content Mexico	Source of vehicle's engine	Percent content U.S. Canada	Percent content Mexico	Source of vehicle's engine	Source of vehicle's transmission
GM							
1	14	54	0 U.S.	0	0	0	0
GM							
2	5	55	Mx	5	55	Mx	Korea or Mx
3	5	65	Mx	5	60	Mx	Mx
4	0	55	Mx	5	50	Mx	Mx
5	0	55	Mx	0	0	0	0
Mazda							
6	0	0	0	5	65	Mx	Thailand
MERCEDES BENZ U.S.							
7	7	46	Germany	4	37	Germany	Germany
8	5	40	Germany	5	40	Germany	Germany
Nissan							
9	10	60	U.S.	15	60	Mx	Mx
Compas /Nissan							
10	15	45	Japan	10	55	Japan	Mx

		Toyota					
		U.S.	U.S. and Japan	U.S. and Japan	U.S.	U.S. and Japan	U.S. and Japan
11	Toyota Tacoma/Toyota/Guanajuato, Mexico	55	0	U.S. and Japan	55	0	U.S. and Japan
12	Toyota Tacoma/Toyota/Tijuana, Mexico	55	0	U.S.	55	0	U.S.
Volkswagen							
13	Volkswagen Golf/GN/Puebla, Mexico	10	27	Mexico	10	27	Mexico
14	Volkswagen Golf/Puebla, Mexico	8	27	Brazil	8	27	Brazil
15	Volkswagen Jetta/Puebla, Mexico	6	32	Brazil	6	32	Brazil
16	Volkswagen Jetta/GU/ Puebla, Mexico	5	33	Mx	5	33	Mx
17	Volkswagen Jetta/GU/ Puebla, Mexico	6	35	Mx	6	35	Mx
18	Volkswagen Jetta/Puebla, Mexico	4	34	Brazil	4	34	Brazil
19	Volkswagen Tiguan/Puebla, Mexico	7	41	Mx	7	37	Mx
20	Volkswagen Tiguan/Puebla, Mexico	10	35	Mx	7	35	Mx
Audi							
21	Audi Q5 PHEV/San José Chiapa, Mexico	2	46	Hungary	2	48	Hungary
22	Audi SQ/San José Chiapa, Mexico	3	63	Hungary	2	61	Hungary
BMW							
23	BMW, 330 E Sedan PC, San Luis Potosí	0	0	0	10	25	Germany
24	3 Series Sedan PC, San Luis, Potosí, Mexico	0	0	0	10	25	Germany
Honda							
25	Honda, HR-V-FWD, MPV, Celaya, Mexico	0	0	0	20	40	Mx
26	HR-V-AWD, Celaya, Mexico	0	0	0	20	35	U.S.

Note: This information does not take into consideration the labor value content or the regional value content of steel and aluminum.

Source: Developed with data from AACP (2020). Listings of passenger motor vehicles labeled with their U.S. / Canadian parts content ^{AACP} (2020), American Automotive Labeling Act (AALA).

REGIONAL VALUE CONTENT FOR AUTO PARTS

The agreement mentions three types of auto parts: core, principal, and complementary. Together, they represent sales for US\$294.86 billion, making up 11.55 percent of the total imports in the USMCA region in 2020.

Core parts for passenger vehicles and light trucks (Figure 1). The RVC requirement for *core parts* is 75 percent using the net cost method and 85 percent using the transaction cost method.⁷ Core parts are about 40 percent of the vehicle cost. The seven core parts (engines, transmissions, body and chassis, axles, suspension systems, steering systems, and advanced batteries) must be manufactured in the region to be considered original. Rubenstein and Klier (2019) point out that most 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 outside the region.

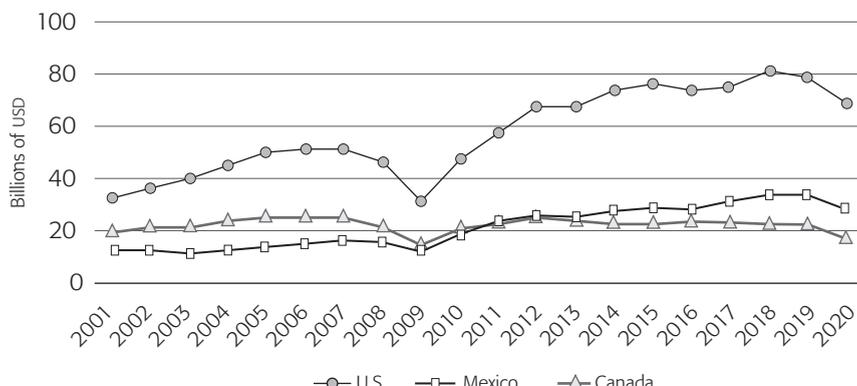
One of the purposes of ROO is to decrease region core-part imports, which grew an AAGR of 4.03 percent in twenty years. In 2020, the region imported US\$113 billion, or 16.2 percent less than the previous year; most of the imports (61 percent) are made by the U.S. The drop in imports is a world trend that began in 2019 and grew during the COVID-19 crisis. However, it is not yet possible to identify whether the drop in imports is the beginning of the expected trend related to USMCA (see Figure 1).

Core parts include seventeen tariff items,⁸ where heading 850760, “Lithium-ion accumulators,” is remarkable as it grew at an AAGR of 20 percent between 2012 and 2020. The USMCA region accounts for 14.8 percent of total world imports of lithium-ion accumulators, and the U.S. imported US\$2.099 billion 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 U.S. or Canada. Arteaga, Marcial, and Ortiz (2021) argue that the agreement tries to increase industry competitiveness *vis-à-vis* China and restrict its presence in the U.S. market. They supposed that competition forced an RVC increase in the most dynamic parts segments to contain China.

⁷ RVC can be calculated applying the net cost method, and its compliance is gradual, reaching the total in three years as follows: 66 percent in 2020, 69 percent in 2021, 72 percent in 2022, and 75 percent in 2023 (DOF, 2020: 209). If RVC is calculated under the transaction value method, it is 85 percent, and its compliance is gradual to reach the total in three years from the entry into force of the trade agreement: 76 percent in 2020, 79 percent in 2021, 82 percent in 2022, and 85 percent in 2023.

⁸ See Table A.1 in the USMCA agreement.

Figure 1
USMCA CORE PARTS IMPORTS



Source: Developed with data from Trade Map (2020), Data Base, Table A.1 Core parts for passenger vehicles and light trucks, seventeen tariff items, and USMCA (n.d.).

Principal parts for passenger vehicles and light trucks (see Figure 2). The RVC requirement for principal parts is 70 percent as estimated by the net cost method or 80 percent if the transaction value method is applied.⁹ Principal parts imports grew up at an AAGR of 4.6 percent in twenty years. However, in 2020, the region imported US\$116.45 billion, 15.3 percent less than the previous year because of the COVID-19 crisis. Most of the imports went to the U.S. (66.7 percent) and Mexico (18.7 percent). Principal parts include thirty-eight tariff items (DOF, 2020: 219). Two tariff items stand out, which together represent 34 percent of total imports: heading 870829, “Other parts and accessories of bodies, including cabs of motor vehicles (excluding body stampings),” imported US\$21.318 billion. This was followed by heading 870899, “Other parts and accessories of motor vehicles of headings 87.01 to 87.05 (excluding chassis frames),” which imported US\$18.382 billion.

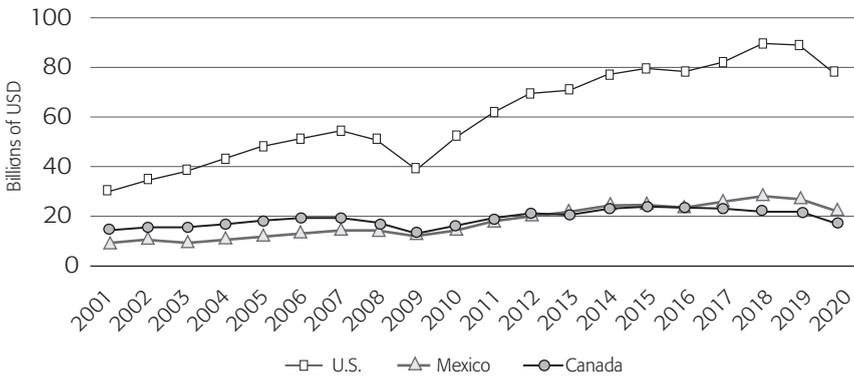
Complementary parts for passenger vehicles and light trucks (see Figure 3). The RVC requirement for these parts is 65 percent applying the net cost method, and 75 percent applying the transaction value method.¹⁰ Imports of these parts grew at an AAGR of 4.5 percent in twenty years. In 2020, the region imported US\$65.409 billion or

⁹ The RVC requirement for “principal parts” is 70 percent applying the net cost method, and its compliance is gradual to reach the total in three years: 62.5 percent in 2020, 65 percent in 2021, 65.7 percent in 2022, and 70 percent 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 percent in 2020, 75 percent in 2021, 77.5 percent in 2022, and 80 percent in 2023.

¹⁰ The RVC for complementary parts is 65 percent; its compliance is gradual to reach the total in three years: 62 percent in 2020, 63 percent in 2021, 64 percent in 2022, and 65 percent in 2023. If the transaction value method is applied, RVC is 75 percent, and the compliance requirement is 72 percent in 2020, 73 percent in 2021, 74 percent in 2022, and 75 percent in 2023.

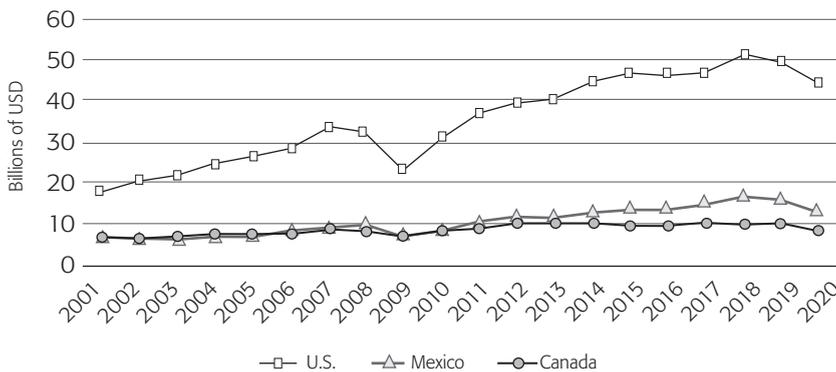
14.08 percent less than the previous year, because of the drop in production related to the COVID-19 crisis, and the U.S. imported 67.7 percent of the total. Complementary parts include twenty-seven tariff items (DOF, 2020: 221). Together, heading 854430, “Ignition wiring sets and other wiring sets of a kind used in motor vehicles,” and heading 842139, “Catalytic converters,” represent 26 percent of the total. However, this trade is mainly intraregional from Mexico to the U.S.

Figure 2
USMCA PRINCIPAL PARTS IMPORTS



Source: Developed using data from Trade Map (2020), Database Table B, Principal parts for passenger vehicles and light trucks thirty-eight tariff items, and USMCA (n.d.)

Figure 3
USMCA COMPLEMENTARY PARTS IMPORTS



Source: Developed with data from Trade Map (2020), Database, Table C Complementary parts for passenger vehicles and light trucks, twenty-seven tariff items, and USMCA (n.d.)

Automakers that cannot comply with the new ROO, but do comply with NAFTA's rules (62.5 percent of RVC), may pay the most-favored-nation rate that will not exceed 2.5 percent for light vehicles and 25 percent for light trucks, limited to a total of 1.6 million units (DOF, 2020: 48). However many doubts have yet 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 that workers who received at least US\$16/hour made 40 percent of the net cost of the vehicle.

The RLVC is made up of three stipulations (DOF, 2020: 213). Twenty-five percent will be accredited for high wages related to materials or manufacturing. Compliance is gradual, to reach the total three years after the trade agreement enters into force: 15 percent by 2020, 18 percent by 2021, 21 percent by 2022, and 25 percent by 2023 (DOF, 2020: 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 assembly. Compliance is mandatory as soon as the trade agreement goes into effect. Five percent of assembly wages are contemplated 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 the treaty renegotiation would lead to higher wages; however, in the end, the work of the Mexican labor force was reduced to participating in only 60 percent of the total value of the automobile. This rule may increase employment in the U.S. and Canada. However, it will hardly improve stagnant wages in the USMCA region because US\$16/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: 496) seeks fairer treatment for workers. It aims to prevent partner countries from not properly enforcing labor laws that protect their workers in order to attract more investment or increase trade: this problem has already arisen 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 each country's labor laws 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: 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: 504).

Monitoring compliance with Article 23 will be the function of the Labor Council overseeing rules and procedures specified in the agreement itself. In addition, 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: 1).

The Mexican government has taken advantage of the commitments made in the agreement and promoted long-pending labor reforms. As a result, changes to the National Labor Law passed in May 2019 include (i) gradual replacement of the functions of the Conciliation and Arbitration Boards by labor courts in the hope of decreasing resolution delays; (ii) the creation of a Federal Center for Conciliation and Labor Registration to register unions and collective bargaining agreements in Mexico; and (iii) the establishment of new mechanisms to guarantee freedom of association. The previous labor law regulated the right to organize unions, but was never enforced (STPS, 2019). Of note are the rules prohibiting "covering up a labor relationship with simulated legal acts to avoid compliance with labor and with social security obligations, and also registering a worker with a lower wage than s/he receives," both widespread practices in Mexico.

There is also confusion about how to calculate this content. The business community 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.

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 or calendar year before export or export quarter, at least 70 percent in value of corporate purchases of steel or aluminum were made in the USMCA region" (DOF, 2020: 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, the USMCA presents some options to help in the transition. Ten percent of a company's total annual production of passenger vehicles or light trucks 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-percent automobile RVC; (b) 62.5-percent RVC for core parts; (c) the 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 wages in materials and manufacturing expenses, unless the three countries agree to modify it (DOF, 2020: 215).

CONCLUSIONS

Companies will probably comply unevenly with the new rules of the agreement depending on their product strategies, how far they are from meeting the new RVC threshold, and the tariff imposed. I 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 by the increase in the RVC because most of the vehicles they manufacture in Mexico and sell in the U.S. were already built with parts made in the area; three Nissan vehicle models were also 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 for some cars, so these automakers are not adjusting to the new rules and some of these vehicles may not be brought into compliance, ending sales in the U.S.

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 bad for 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 situation, as their engines and transmissions come from Hungary and Germany. Furthermore, opening a new internal combustion engine plant in the USMCA region does not make sense because of the technological change towards electromobility. Therefore, paying a 2.5-percent tariff and increasing the car's price may be an option for them. Also, BMW is already deploying 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; Nissan's Sentra and the QX50 of its luxury brand Infiniti; 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 U.S. 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 percent) than from the U.S. and Canada (24.17 percent); this could help comply with the RLVC, limiting Mexican labor's value to 60 percent of the value of the car. In addition, all GM engines are manufactured in the U.S., while all Nissan and Hyundai-Kia are made in Mexico.

The FTA is increasing transaction costs because of the burden of applying the 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 workers' conditions, 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 since it does not produce steel for the automotive industry, and aluminum production is limited.

I analyzed changes in imports from the three groups of auto parts regulated that represent 11.55 percent of total imports in the USMCA region in 2020. Four elements stand out among these changes: *a)* The COVID-19 crisis negatively affected imports of core, principal, and complementary parts, which decreased on average 15 percent from 2019 to 2020; *b)* The United States was the partner country that imported more auto parts: 65 percent of the total; *c)* U.S. imports of lithium accumulators come from China, the world's leading producer. This is important because the future of the

automotive industry is electromobility, which depends on lithium batteries and, therefore, imports should be replaced shortly by batteries produced in the USMCA region; and, finally, *d*) The intraregional trade of complementary auto parts includes “ignition-wiring sets,” which are at the top of the list in Mexico’s production and exports to the U.S.

By 2020, there was a general decline in production, regional trade, foreign direct investment, and employment related to the COVID-19 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 will continue to 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 insisting on giving greater importance to manufacturing in Mexico. It is necessary to replace inexpensive labor and a devalued currency as the main reasons 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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