

# Chinese Automotive and Electronics Trade and Investment in Mexico

November 2024

**David Coffin**

**Sharon Ford**

**Edward Petronzio**

Disclaimer: Office of Industry and Competitiveness Analysis working papers are the result of the ongoing professional research of USITC staff and solely represent the opinions and professional research of individual authors. These papers do not necessarily represent the views of the U.S. International Trade Commission or any of its individual Commissioners.

## **Abstract**

This paper compares Chinese investment in the Mexican automotive and electronics sectors. The paper explains how the concept of substantial transformation could allow significant amounts of Chinese content to enter the United States via Mexico, effectively circumventing Section 301 tariffs. Then it examines Chinese investments in Mexico's automotive and electronic sectors. Chinese companies have made significant investments in Mexico and Mexican imports of intermediates from China have increased significantly.

# **Chinese Automotive and Electronics Trade and Investment in Mexico**

**David Coffin, Sharon Ford, Edward Petronzio**

Office of Industry and Competitiveness Analysis  
U.S. International Trade Commission (USITC)  
November 2024

This paper represents solely the views of the author and is not meant to represent the views of the U.S. International Trade Commission or any of its commissioners. Please direct all correspondence to David Coffin or Sharon Ford, Office of Industry and Competitiveness Analysis, or Ed Petronzio, Office of Tariff Affairs and Trade Agreement, U.S. International Trade Commission, 500 E Street, SW, Washington, DC 20436, telephone: 202-205-2232, email: [David.Coffin@usitc.gov](mailto:David.Coffin@usitc.gov) or telephone: 202-205-3084, email: [Sharon.Ford@usitc.gov](mailto:Sharon.Ford@usitc.gov) or telephone: 202-205-3033, email: [Edward.Petronzio@usitc.gov](mailto:Edward.Petronzio@usitc.gov).

The author would like to thank Fernando Gracia, Ryan Kane, Jeff Walling, and Heather Wickramarachi for their helpful comments and David Lahrmer and Fara Ndiaye for their production support.

# Chinese Automotive and Electronics Trade and Investment in Mexico

## Abstract

This paper compares Chinese investment in the Mexican automotive and electronics sectors. It explains how the principle of substantial transformation in international trade could allow significant amounts of Chinese content to enter the United States via imports of Mexican products.<sup>1</sup> Then it examines Chinese investments in Mexico's automotive and electronic sectors. Chinese companies have made significant investments in Mexico and Mexican imports of intermediates from China have increased significantly.

## Introduction

For nearly three decades, U.S. imports from China rose steadily, comprising 21.6 percent of total U.S. imports in 2017.<sup>2</sup> Trade tensions and the imposition of tariffs on many Chinese goods in 2018 disrupted the upward trend; imports began to fall and, with the onset of the COVID-19 pandemic in 2020, did so at an accelerated pace. China's share of total U.S. imports declined from 21.6 percent in 2017 to 13.7 percent in 2023.<sup>3</sup> During the same period, Chinese firms became increasingly active in Mexico, investing in energy, infrastructure, and logistics; and setting up manufacturing facilities. According to an analysis by the World Trade Organization, there has been a considerable increase in the proportion of U.S. imports from China through Mexico. From 2017 to 2021, indirect intermediate U.S. imports from China via Mexico rose from 5 percent to 8 percent.<sup>4</sup>

Mexico is an attractive FDI destination for Chinese FDI for a variety of reasons. Mexico has relatively low production, logistics, and shipping costs, a large internal market, openness to trade, and, most significantly, geographic proximity to the United States and Canada and USMCA preferential tariffs. Further, many Chinese companies are becoming multinational. They are thus investing in production in multiple locations for various reasons, such as co-locating with customers, reducing supply-chain disruptions, and increasing resiliency.

The growing presence of Chinese firms in Mexico has elicited concerns from U.S. stakeholders. Some argue that the firms threaten U.S. industrial production and may pose risks to the national security of the United States. In September 2024, a bipartisan group of U.S. senators warned that China is exploiting the

---

<sup>1</sup> The origin of a good is usually determined to be the last place in which it was substantially transformed into a new and distinct article of commerce based on a change in name, character, or use. U.S. Customs and Border Protection, "What Every Member of the Trade Community Should Know about U.S. Rules of Origin," Informed Compliance Series, May 2004, p. 9.

<sup>2</sup> World Trade Organization (WTO), "Global Value Chain Development Report 2023," 2023, 65.

<sup>3</sup> Chinese firms have also increased investments in Vietnam, Cambodia, and Malaysia.

<sup>4</sup> The WTO calculates indirect intermediate imports using input-output tables, taking the share of intermediates consumed in Mexico from China, and assuming that share is equivalent to the share of Chinese intermediates in Mexican exports. World Trade Organization (WTO), "Global Value Chain Development Report 2023," 2023, 65.

USMCA and creating opportunities for illicit transfer of technology to Chinese firms.<sup>5</sup> Others contend that the investments are a vehicle to circumvent high U.S. tariffs on Chinese goods.<sup>6</sup> For example, in March 2024, the Washington International Trade Association held an event examining Chinese investment in the Mexican automotive industry (and the possible implications for the U.S. automotive industry).<sup>7</sup> Written submissions from the Economic Policy Institute (EPI) and International Union, United Automobile, Aerospace and Agricultural Implement Workers of America (UAW) to the U.S. Trade Representative (USTR) expressed similar concerns.<sup>8</sup> EPI's submission states "...Chinese-owned and -affiliated firms are penetrating North American automotive supply chains with rapidly expanding manufacturing platforms in Mexico..."<sup>9</sup> EPI argues these investments could allow significant amounts of Chinese content to avoid China-specific tariffs and enter the U.S. market via Mexico.<sup>10</sup>

Mexican stakeholders have a more ambivalent view of Chinese investment. Some stakeholders share some of the United States' concerns about the quality of Chinese investment, and are also concerned that trade with China is one-way. For example, Mexico's Finance Minister Rogelio Ramírez de la O recently stated that Mexico relies too much on China for basic products.<sup>11</sup> Conversely, other stakeholders see value in Chinese investment in Mexico and argue that Chinese firms establishing production in Mexico is a positive.<sup>12</sup> Additionally, proponents point out that Mexico does not have the technological ability in some industries to substitute domestic products for some of the products made in China.<sup>13</sup>

The Mexican government has acted to limit Chinese investment by removing incentives, pausing meetings, and increasing scrutiny. In December 2023, U.S. Treasury Secretary Janet Yellen and Mexico's Secretary of Finance and Public Credit Rogelio Ramírez de la O signed a Memorandum of Intent affirming the importance of foreign investment screening and "their desire to establish a bilateral working group for regular exchanges of information about how investment screening can best protect national security."<sup>14</sup> Reuters reported in April 2024 that the Mexican government did not offer incentives such as low-cost public land or tax cuts to Chinese EV makers considering investing in an assembly plant in Mexico.<sup>15</sup> At a recent North America manufacturing conference, Mexico's Undersecretary for Foreign Trade Luis Rosendo Gutiérrez stated, "We can work together, and we can be stronger together, and we can be more competitive together."<sup>16</sup> Mr. Gutierrez has also noted Mexico's interest in having

---

<sup>5</sup> Letter to President Joseph Biden from U.S. Senators Sherrod Brown (D-OH); Mike Braun (R-IN), Bob Casey (D-PA), and Marco Rubio (R-FL), September 19, 2024.

<sup>6</sup> Chinese firms have also increased investments in Vietnam, Cambodia, and Malaysia.

<sup>7</sup> Washington International Trade Association and Asia Society, "What's Driving Chinese Investment into the Mexican Automotive Sector?," March 13, 2024.

<sup>8</sup> Hersh, "EPI Comments to the Office of the United States Trade Representative," January 22, 2024; UAW, "UAW's Public Comment on Operation of the USMCA," January 17, 2024.

<sup>9</sup> Hersh, "EPI Comments to the Office of the United States Trade Representative," January 22, 2024.

<sup>10</sup> Hersh, "EPI Comments to the Office of the United States Trade Representative," January 22, 2024.

<sup>11</sup> Pérez, "Mexico Wants to Curb Chinese Imports With Help From U.S. Companies," October 8, 2024.

<sup>12</sup> Ji, "Mexico Scrambles to Reassure Chinese Investors amid Trump Tariff Threats," November 28, 2024; Pérez, "Mexico Wants to Curb Chinese Imports With Help From U.S. Companies," October 8, 2024.

<sup>13</sup> Pérez, "Mexico Wants to Curb Chinese Imports With Help From U.S. Companies," October 8, 2024.

<sup>14</sup> U.S. Department of the Treasury, "Secretary of the Treasury Janet L. Yellen and Mexico's Secretary of Finance and Public Credit Rogelio Ramírez de La O Announce Intent to Establish Bilateral Working Group on Foreign Investment Review," March 19, 2024.

<sup>15</sup> Oré, "Exclusive: Mexico, Facing Pressure," April 18, 2024.

<sup>16</sup> Palmer, "Mexican official says government working to address Chinese," November 20, 2024.

manufacturers from the United States and other countries substitute automotives, electronics and other goods from China.<sup>17</sup>

This working paper examines Chinese investment in two of Mexico's largest industries—automotive and electronics—from 2013 to 2023, focusing on the five years leading up to 2023. It considers these investments' drivers, trends, and extent in three parts. Part I provides background and context to understand the significance of—and concerns about—increasing Chinese investment in Mexico. Part II explains the Harmonized Tariff Schedule (HTS) and substantial transformation tests wherein differences potentially allow a much greater share of Chinese content in vehicles than electronics in Mexico. Part III analyzes Chinese FDI in the aggregate and the subject industries in Mexico. It also considers relevant shifts in trade and investment among China, Mexico, and the United States. After explaining how Chinese FDI in Mexico enables Chinese content to enter the U.S. market through final assembly in Mexico, this paper then focuses on China's growing investment in Mexican automotive and electronics production.

## The Tariff Angle

### Understanding the Harmonized Tariff Schedule

The HTS is the primary resource for determining tariff classifications for goods imported into the United States. HTS codes are also used to collect trade data and to determine the appropriate duty rate on imported goods. An HTS code is comprised of its chapter (first two digits), heading (first four digits), subheading (first six or eight digits), and statistical reporting number (full ten digits). For example, new fully electric passenger vehicles with an EPA-rated range of 300 miles would be provided for in 8703.80.0060 (figure 1). See the orange boxes in figure 1 below.

---

<sup>17</sup> MexicoNow, "Mexico wants to curb Chinese imports," October 10, 2024.

**Figure 1** Automotive HTS example

CHAPTER 87						
VEHICLES OTHER THAN RAILWAY OR TRAMWAY ROLLING STOCK, AND PARTS AND ACCESSORIES THEREOF						
Heading/ Subheading	Stat. Suf- fix	Article Description	Unit of Quantity	Rates of Duty		
				General	1 Special	2
8703		Motor cars and other motor vehicles principally designed for the transport of persons (other than those of heading 8702), including station wagons and racing cars:				
8703.80.00		Other vehicles, with only electric motors for propulsion.....		2.5% <sup>1/</sup>	Free (A+, AU, B, BH, CL, CO, D, E, IL, JO, KR, MA, OM, P, PA, PE, S, SG)	10%
		With an EPA-rated range not exceeding 250 miles:				
	20	New.....	No.			
	45	Used.....	No.			
		With an EPA-rated range exceeding 250 miles:				
	60	New.....	No.			
	80	Used.....	No.			

Source: Harmonized Tariff Schedule of the United States, 2024.

Rates of duty are assessed at the 8-digit level (e.g., 8703.80.00) and are provided for in the two primary rate columns. Column 1- *general* (see blue box in figure 1) identifies the rates of duty for countries that are entitled to most favored nation treatment (MFN), known in the United States as normal trade relations (NTR) status. Almost all countries of the world are eligible to receive these duty rates. As seen in figure 1, the NTR rate for subheading 8703.80.00 is 2.5 percent *ad valorem*. Column 1- *special* (see green box in figure 1) is a subset of Column 1 and identifies lower-than-general or duty-free rates for products under programs such as free trade agreements and preference programs.<sup>18</sup> Rates of duty in Column 2 (red box) apply to products of countries that do not have NTR status.<sup>19</sup>

The HTS also features endnotes and footnotes, which do not have legal status and are simply provided for ease of reference. Endnotes in the Rates of Duty columns, such as the one above (see blue arrow towards “1/” beside the 2.5 percent rate of duty above) refer to additional rates of duty.<sup>20</sup>

<sup>18</sup> An importer would be eligible for duty-free treatment for imports under 8703.80.00 under the U.S.-Mexico-Canada Agreement or USMCA (abbreviation “S”) provided they met the criteria specified in the product specific rules for USMCA in General Note 11 of the HTS. When an importer fails to claim a special duty rate, or where no special duty rate is provided, the rate of duty in column 1- *general* (blue box) applies.

<sup>19</sup> These countries are listed in HTS general note 3(b) and currently are Belarus, Cuba, North Korea, and Russia.

<sup>20</sup> In this instance, the endnote refers to subheading 9903.91.03, which assesses an additional 100 percent duty on goods classified under this subheading that are products of China under Section 301 of the Trade Act of 1974. The language legally instructing Customs and Border Protection (CBP) to assess additional duties under Section 301 are contained in the U.S. Notes to HTS Section XXII, Chapter 99, Subchapter III. Subheading 9903.91.03 refers to U.S. Note 31(d), which states that products of China classified in the subheadings listed in U.S. Note 31(e) shall be subject to additional 100 percent *ad valorem* duties. U.S. note 31(e) then includes a list of 8-digit subheadings, including subheading 8703.80.00, which, if a product of China, would be subject to a 102.5 percent *ad valorem* duty (the NTR rate of 2.5 percent *ad valorem* plus 100 percent *ad valorem* under the China Section 301 tariffs).

## Country of Origin and Substantial Transformation

To understand what makes a good a “product of China”, one must understand the definition of “country of origin”, which is defined as the “country of manufacture, production, or growth of any article of foreign origin entering the United States.”<sup>21</sup> To use a simple example, an electric passenger vehicle assembled in China with 100 percent Chinese-origin components would be considered a “product of China” and subject to any China-specific duties. However, the distinction might be less obvious if the same vehicle were assembled in Mexico with 80 percent Chinese-origin components. In this scenario, one must consider the second part of the country-of-origin definition, which states: “Further work or material added to an article in another country must effect a *substantial transformation* in order to render such other country the ‘country of origin.’”<sup>22</sup>

U.S. Customs and Border Patrol (CBP) is the U.S. agency responsible for determining country of origin. These determinations can be quite complex if they involve products comprised of globally sourced components that undergo manufacturing processes in multiple countries. In order to determine country of origin and the applicability of trade remedies, CBP applies the substantial transformation analysis to assesses whether an article emerges from a process with a new name, character, or use, different from that possessed by the article prior to processing.<sup>23</sup> CBP also considers the extent of the operations performed and whether the parts used in the processes lose their identity and become an integral part of the new article. If the manufacturing or combining process is a minor one, leaving the identity of the article intact, a substantial transformation has not occurred.<sup>24</sup>

When an importer or interested party wants to understand how CBP will handle a particular transaction, including how a good should be classified or what country is the appropriate country of origin, it can request what is known as a ruling letter. A ruling letter may be requested by any person who, as an importer or exporter of merchandise, or otherwise, has a direct and demonstrable interest in the question or questions presented in the ruling request, or by the authorized agent of such person.<sup>25</sup> These letters are binding and provide a careful consideration of the specifically described transaction, a definitive interpretation of applicable law, or other appropriate information.<sup>26</sup>

Ruling letters involving country of origin questions must consider where the various production steps take place. Therefore, CBP asks parties requesting rulings to provide information related to: the countries where each of the source materials were made or harvested; the countries where each of the various production steps took place; and a complete description of the component parts and the role that those parts play in the final product.<sup>27</sup> These rulings are unique to the set of circumstances described in the

---

<sup>21</sup> [19 CFR § 134.1.](#)

<sup>22</sup> [19 CFR § 134.1.](#)

<sup>23</sup> CBP applies a different analysis to determine country of origin for purposes of assessing special rates of duty under a free trade agreement, such as the United States-Mexico-Canada Agreement (USMCA). In those instances, CBP applies product specific rules that negotiated between the parties to an agreement, which typically involve a tariff classification shift or a local or regional value content requirements.

<sup>24</sup> *Uniroyal, Inc. v. United States*, 3 C.I.T. 220, 226, 542 F. Supp. 1026, 1031, *aff'd*, 702 F.2d 1022 (Fed. Cir. 1983).

<sup>25</sup> A “person” in this context includes an individual, corporation, partnership, association, or other entity or group. See 19 C.F.R. Part 177.

<sup>26</sup> CBP, “What is a Ruling Letter?,” accessed September 6, 2024.

<sup>27</sup> U.S. Customs and Border Protection Rulings Program:  
[https://www.cbp.gov/sites/default/files/documents/cbp\\_rulings\\_prog\\_3.pdf](https://www.cbp.gov/sites/default/files/documents/cbp_rulings_prog_3.pdf)



requests; however, reviewing these decisions is informative to better understand the application of the substantial transformation analysis.<sup>28</sup> CBP maintains an online database of these rulings in its Customs Rulings Online Search System (CROSS).<sup>29</sup>

## The Substantial Transformation Test for Motor Vehicles

In the case of automotive manufacturing, substantial transformation is often dependent upon the location in which complex operations (e.g., vehicle assembly) have taken place. While a motor vehicle is made up of tens of thousands of individual parts and full assembly is quite complex, some vehicle manufacturers export sets of parts (or “kits”) to a third country for final assembly, which does not qualify as substantial transformation. This section includes two examples. The first involves complex assembly, where multiple workstations in one country substantially transformed various components, the vast majority percent of which were produced outside of that country, into a finished vehicle. This stands in contrast to the second example, where CBP determined that the final assembly operations in Sweden did not rise to the same level of complexity and therefore, did not constitute substantial transformation.<sup>30</sup>

In October of 2023, CBP issued an advance ruling involving an electric passenger vehicle that would be imported into the United States after assembly in Country A from globally sourced components.<sup>31</sup> The requester noted that 75 percent of the components (including the battery pack, electric drive unit, and body shell) would be of Chinese origin; 15 percent (including the bumpers, wheels and tires, and seats) would be from Country A; and the remaining 10 percent would come from the rest of the world. In its analysis, CBP found the following. First, the Chinese origin components could not operate as an electric vehicle and would need to be assembled in Country A with other necessary components and assemblies at more than 60 workstations in Country A. Second, during the production process, these Chinese components lose their individual functions and identity and become an integral part of the passenger vehicle with a new character and use. Therefore, CBP determined that the manufacturing processes in Country A would constitute a substantial transformation.

In a ruling from July 2021, CBP issued a decision involving a passenger vehicle imported into the United States from Sweden.<sup>32</sup> The requestor described a situation in which five major subassemblies would be manufactured in China from components from various countries. These subassemblies would then be sent to Sweden for assembly into a finished vehicle. In its analysis, CBP found that the complex assembly process occurred during the production of the subassemblies in China and that the subsequent assembly that occurred in Sweden “did not rise to the level of complex processes necessary for a substantial transformation to occur”. CBP further noted that the five subassemblies from China had a pre-determined end-use and did not undergo a change in use due to the assembly process in Sweden.

---

<sup>28</sup> 19 CFR 177.9 notes that rulings are specific to the transaction described in the letter and cautions against assuming the “principles of that ruling will be applied in connection with any transaction other than the one described in the letter”.

<sup>29</sup> CBP, Customs Rulings Online Search System, accessed September 6, 2024.

<sup>30</sup> Assembly operations that are minimal or simple, as opposed to complex and meaningful, will generally not result in substantial transformation. See C.S.D. 80-111, C.S.D. 85-25, C.S.D. 89-110, C.S.D. 89-118, C.S.D. 90-51, and C.S.D. 90-97. Definitions of “simple assembly” and “minor processing” are provided for 19 C.F.R. §102.1.

<sup>31</sup> See ruling H330647, Fully Electric Passenger Vehicles; Origin; Section 301, October 5, 2023. In its letter to CBP, the requestor asked for confidential treatment with regard to certain processing activities as well as the name of the country where final assembly would take place. Thus, the name of this country in the ruling is “Country A”.

<sup>32</sup> See ruling H302821: Passenger Vehicles; Country of Origin Marking; Section 301 Measures, July 26, 2019.

Therefore, CBP found that the subassemblies and the foreign parts that were imported to Sweden were not substantially transformed and the passenger vehicle was a product of China.

## The Substantial Transformation Test for Electronics

As with automotive products, determinations involving substantial transformation in electronic goods require an analysis as to where the complex assembly has taken place. However, for electronic goods, additional consideration must be given to the role that programming and software installation plays in the production process, which CBP and the courts have held can constitute substantial transformation.<sup>33</sup> Indeed, the first example below illustrates that final assembly operations, including programming and software installation in Mexico substantially transformed a device that was manufactured in China. It is also important to note the simple software installation alone may not be enough to constitute substantial transformation. In the second example below, CBP found that the loading of an operating system (OS) onto a laptop in Japan did not constitute substantial transformation of the good, which was manufactured in China.

In January 2018, CBP issued a ruling involving a Nyquist Ethernet Switch, a device designed to interconnect devices on a computer network consisting of one or more printed circuit board assemblies (“PCBA”), two power supplies, an uplink module, a protective metal housing, and ancillary devices to support additional features.<sup>34</sup> In terms of the production process, the PCBAs (comprised of the application specific integrated circuit (“ASIC”), the central processing unit (“CPU”), synchronous dynamic random access memory (“SDRAM”), and flash components) were manufactured in China using components sourced from a variety of sources, including China, Korea, and Taiwan. The PCBAs were then tested and shipped to Mexico for final assembly, which entailed the addition of the casing, power supply, uplink modules, and ancillary devices to the PCBA, as well as software loading, configuration, and testing. To transform the PCBA into a functioning Ethernet switch, the CPU and memory chips first required programming the CPU and memory chips with their processing functionality. Then, the operating system was downloaded onto the Ethernet switch. In this instance, CBP found that the PCBAs that were produced from China were substantially transformed by the final assembly, software loading, configuration, and testing operations in Mexico. Thus, the good was considered a product of Mexico.

In February 2021, CBP issued a ruling involving a 10.1-inch Tablet PC, described as a portable personal computer that consists of a 10.1-inch capacitive touchscreen display.<sup>35</sup> The ruling notes that the product is manufactured in China and then sent to Japan where the OS is installed, the labels are applied, and the device is packed for export to the United States. In this ruling, CBP found that the tablet was not substantially transformed in Japan by installing the OS or applying labels. CBP added that the device was identified as a portable automatic data processing (ADP) machine upon export from China and remained

---

<sup>33</sup> See *Data General Corp. v. United States*, 4 CIT 182 (1982). In that case, the court determined that the programming of a foreign PROM (Programmable Read-Only Memory chip) in the United States substantially transformed the good into a U.S. article. It reasoned that the programming altered the character of a PROM and that the essence of the article, its interconnections or stored memory, was established by programming. See also H323941: Internal Advice; Country of Origin of Solid-State Drives; Section 301 Trade Remedy, February 15, 2023.

<sup>34</sup> H282390: U.S. Government Procurement; Country of Origin of Ethernet Switch; Substantial Transformation, January 30, 2018.

<sup>35</sup> N316942: The country of origin of a ruggedized tablet computer and the applicability of certain trade remedies under Section 301, Feb 1, 2021.

a portable ADP machine upon export from Japan. Further, CBP noted that it has consistently held that loading software does not amount to programming, which involves writing, testing, and implementing code necessary to make the tablet function a certain way. Therefore, CBP found the tablet to be a product of China.

## Chinese Investment and Trade Trends in Mexico

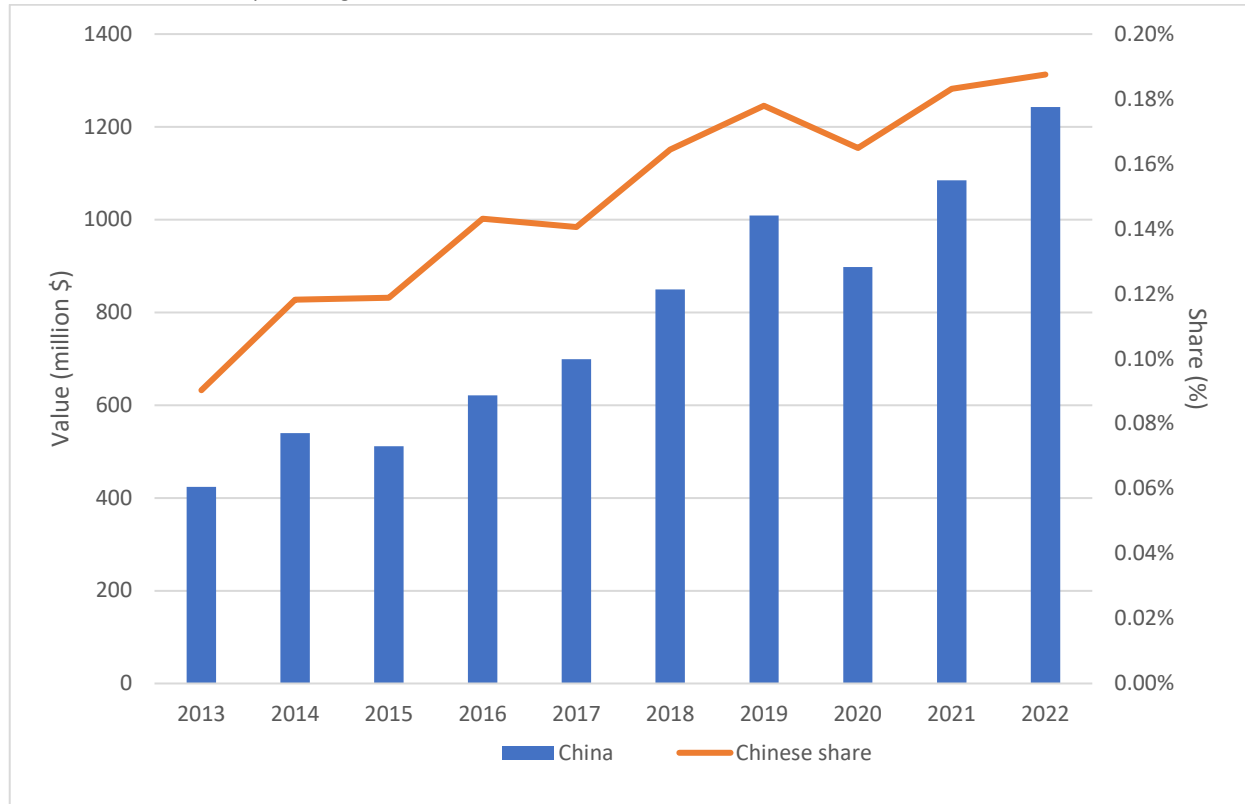
The previous section's description of country of origin rules may explain why many Chinese companies appear to be moving final assembly for many products outside of China, with a significant share going to Mexico. This section examines recent Chinese investment in Mexico, with a particular focus on assembly of goods with significant Chinese content in automotive and electronics. Chinese investment in Mexico grew rapidly during 2013–22 but began from a tiny base (figure 2). Chinese FDI positions in Mexico grew from over \$400 million (0.09 percent of inward Mexican FDI positions) in 2013 to over \$1.2 billion (0.19 percent of inward Mexican FDI positions) in 2022. During the decade, China rose in rank from 26th to 7th of Mexico's most significant sources of FDI flows.<sup>36</sup>

---

<sup>36</sup> In 2022, top sources of FDI flows into Mexico were the United States (56.1 percent), Canada (8.1 percent), Argentina (6.4 percent), Japan (6.3 percent), United Kingdom (3.4 percent), France (2.3 percent). OECD.Stat, FDI financial flows - By partner country, BMD4 (accessed February 21, 2024).

**Figure 2:** Inward Mexican FDI positions from China, 2013–22

In millions of dollars and percentages



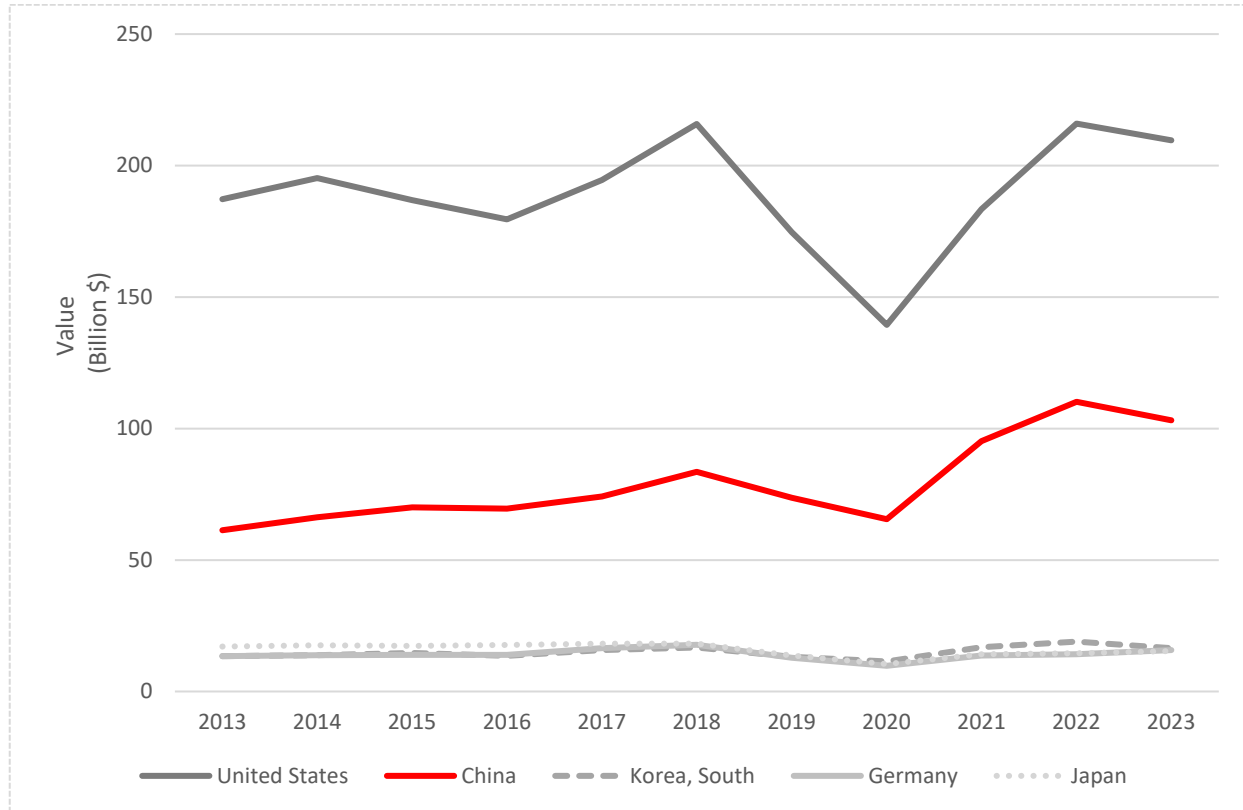
Source: OECD.Stat, FDI - by counterpart country, BMD4 (accessed February 21, 2024).

Mexican imports from China also increased significantly after 2020, rising from \$65 billion in 2020 to \$110 billion in 2022 (figure 3). The top five HS4 headings over this period were all electronics-related, including: telephones (HS 8517, 11 percent of Mexican imports from China during 2013–22), machine parts (HS 8473, 7 percent), computers (HS 8471, 6 percent), integrated circuits (HS 8542, 4 percent), and television parts (HS 8529, 4 percent). Imports from China comprised 23 percent of total Mexican imports in 2022, second only to imports from the United States.<sup>37</sup>

<sup>37</sup> In 2013, imports from the United States comprised 49.3 percent of total Mexican imports.<sup>37</sup> S&P Global Market Intelligence, accessed February 29, 2024.

**Figure 3: Mexican imports, 2013–22**

In billions of dollars



Source: S&amp;P Global Market Intelligence, all products, accessed February 29, 2024.

The estimated Chinese share of value-added in all Mexican exports rose from 2.4 percent in 2013 to 4.3 percent in 2020.<sup>38</sup> This gain likely reflects growth in Mexican imports of components and parts relative to final goods from China. As a result, China moved from being the fourth- to the third-largest source of value-added content in Mexican exports behind the United States and Canada.

## Automotive case study

Mexico is a vital part of the North American automotive supply chain. Mexico is the second-largest vehicle producer in the region, producing 3.5 million units per year from 2013 to 2022 and a major automotive parts producer and exporter.<sup>39</sup> Automotive parts suppliers produce a range of automotive parts in Mexico, mainly using Mexico as a low-cost parts supplier for U.S. and Canadian vehicles. In recent years, Chinese vehicle and parts manufacturers have invested in Mexico. These investments aim to supply the Mexican vehicle and parts market and export to North America and the rest of the world. Mexico has 13 trade agreements with 50 countries, making it a valuable export platform.<sup>40</sup>

China has a long history of supplying upstream automotive inputs, exporting a wide range of parts that are then assembled into larger systems. For example, the second-largest statistical reporting number for

<sup>38</sup> OECD, TiVA 2023.

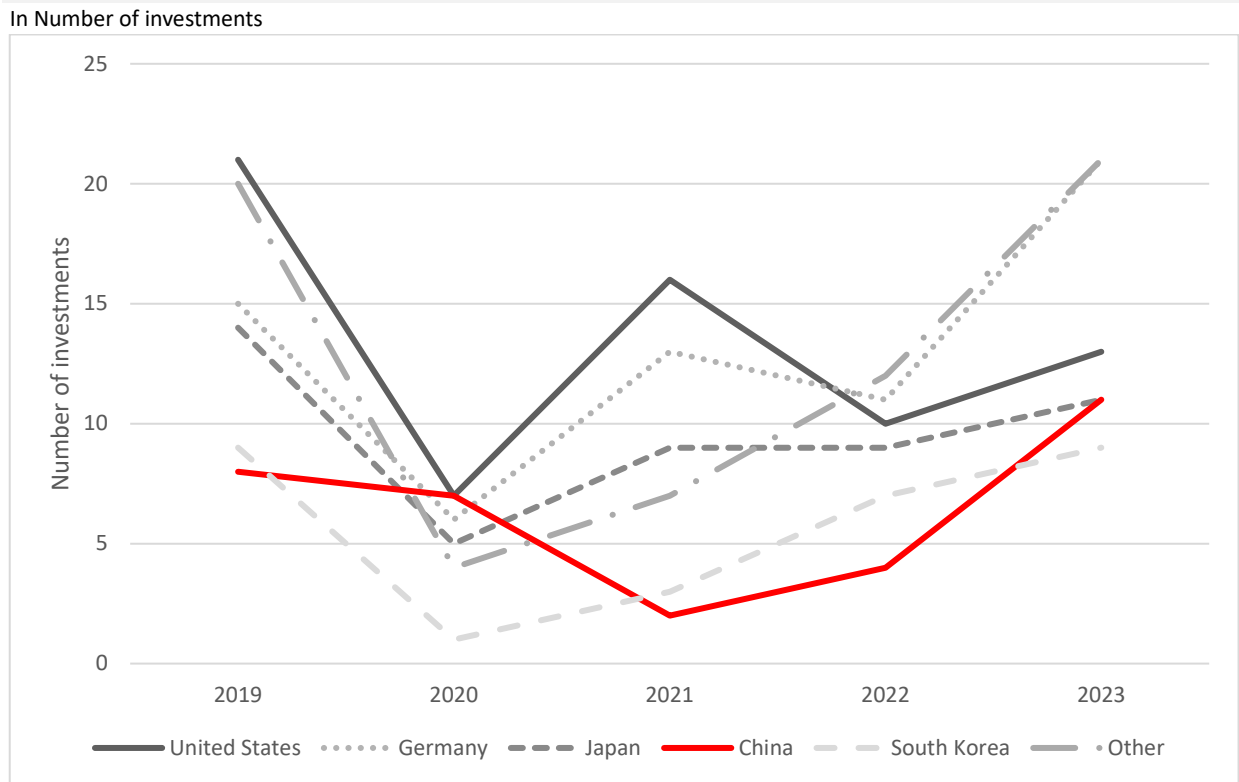
<sup>39</sup> Wards Intelligence, "Mexico Car and Truck Production by Manufacturer, 1985-2023," March 29, 2024.

<sup>40</sup> Privacy Shield, "Mexico - Trade Agreements," accessed April 17, 2024.

U.S. imports from China in 2023 was 8708.29.5160, which is a so-called “basket” category for certain automotive parts and accessories of heading 8701 to 8705 and not specifically mentioned in the HTS.<sup>41</sup> China is a major global producer of lithium-ion batteries, which is the one major exception to its tendency of exporting upstream inputs.<sup>42</sup>

Recent Chinese automotive investment in Mexico has been significant. The Center for Automotive Research’s Book of Deals recorded 14 new Chinese investments in Mexico totaling \$8.5 billion in 2023, almost all of them for automotive parts.<sup>43</sup> Per FDI Markets, Chinese companies announced the fourth-most automotive investments in Mexico (behind the United States, Germany, and Japan) from 2019 to 2023 (figure 4).<sup>44</sup> In addition, three Chinese electric vehicle manufacturers and a battery manufacturer are reportedly considering investing in Mexican plants.<sup>45</sup> A separate estimate of Chinese motor vehicle and parts investment in Mexico found that China’s share more than doubled from 5.1 percent of investment during 2013–17 to 10.5 percent of investment during 2018–22.<sup>46</sup>

**Figure 4:** Automotive parts investments in Mexico by source country, 2019–23



<sup>41</sup> USITC Dataweb/Census, imports for consumption, Department of Commerce automotive parts list (accessed March 12, 2024). This statistical reporting number provides for “other parts and accessories, not elsewhere specified or included, of bodies (including cabs) of heading 8701 to 8705”.

<sup>42</sup> Bhutada, “Visualizing China’s Dominance in Battery Manufacturing (2022-2027P),” January 19, 2023.

<sup>43</sup> CAR, Book of Deals, (accessed February 2024).

<sup>44</sup> FDI Markets (accessed February 2024).

<sup>45</sup> Murray, Chu, and White, “US Concern over Mexico Attracting Chinese Electric Vehicle Factories,” December 17, 2023.

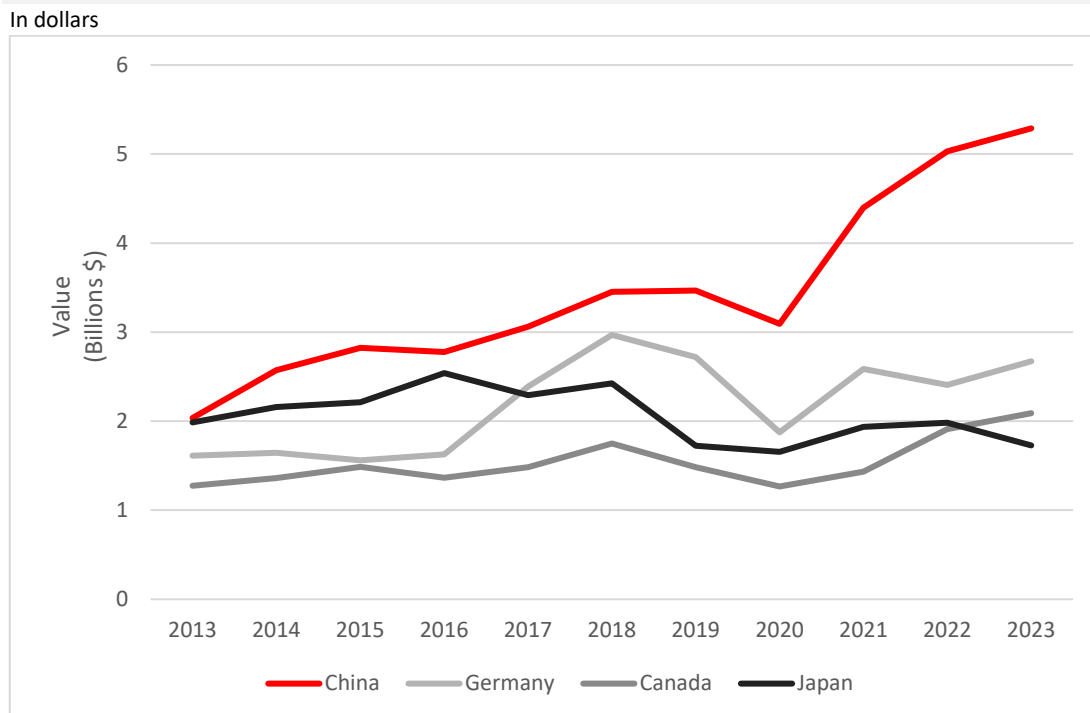
<sup>46</sup> Ray, U.S.-China Economic and Security Review Commission, Consumer Products from China, March 1, 2024, 6.

Source: FDI Markets (accessed February 2024).

At least three of the Chinese investments recorded by the Book of Deals in Mexico in 2023, totaling \$650 million, were for plants that would die-cast aluminum parts (and produce parts in other ways).<sup>47</sup> These investments in Mexico by Chinese aluminum automotive parts suppliers may have been intended to act as an outlet for Chinese excess aluminum capacity, which is relatively expensive to export to the United States because of a 25 percent tariff on imports from China (and 232 tariffs). Due to a July 2024 agreement between the United States and Mexico, aluminum smelted in China and stamped or cast in Mexico would still incur 232 tariffs.<sup>48</sup> By casting Chinese aluminum into automotive parts in Mexico, the producers may not meet USMCA automotive rules of origin (60 to 75 percent regional value content depending on the part), but they likely face significantly lower U.S. tariffs than if the parts were cast in China.<sup>49</sup>

Mexico's imports of automotive parts from China have increased significantly from about \$2.0 billion in 2013 to nearly \$5.3 billion in 2023 (figure 5). While China was the second-largest source of automotive parts imports behind the United States for the whole 10-year period, the gap between it and the rest of Mexico's sources of automotive parts increased significantly during the period. Top Mexican imports of automotive parts from China in 2023 included parts and accessories of bodies (\$711.3 million), brake parts (\$613.4 million), and road wheels (\$562.7 million). These three subheadings accounted for more than 36 percent of Mexico's automotive parts imports from China in 2023.

**Figure 5:** Mexican automotive parts imports from non-U.S. sources, 2013–23



Source: S&P Global Market Intelligence, automotive parts, accessed August 14, 2024.

<sup>47</sup> CAR, Book of Deals, (accessed February 2024).

<sup>48</sup> Lawder, "US, Mexico Move to Thwart China Circumvention of Tariffs," July 10, 2024.

<sup>49</sup> USITC, *USMCA Automotive Rules of Origin: Economic Impact and Operation, 2023 Report*, June 30, 2023, 91–93.

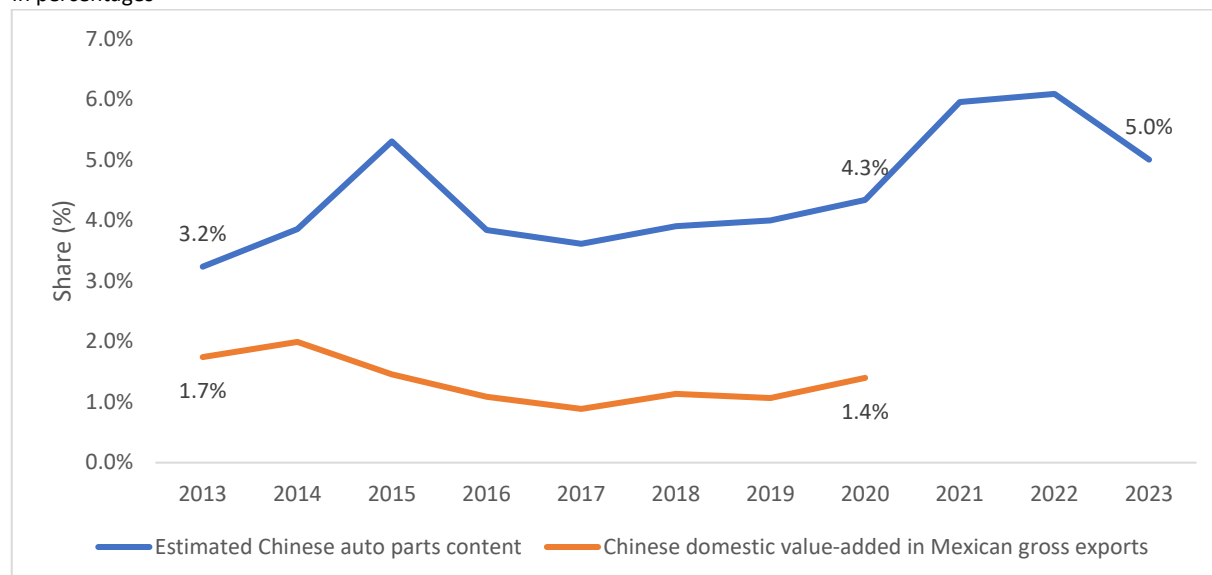
## Chinese Automotive and Electronics Trade and Investment in Mexico

Note: Mexican automotive parts imports from the United States increased from \$20 billion in 2013 to \$25.8 billion in 2023. This includes only (Harmonized System) HS subheadings that are exclusively or primarily vehicle parts. For a full list of HS subheadings included, see table F.5 of USITC, “USMCA Automotive ROOs 2023,” June 2023.

The connection between increased Chinese automotive investments in Mexico and increased Mexican imports from China on the value of Chinese content in Mexican production/exports is somewhat unclear. Theoretically, FDI in downstream industries should lead to increases in home country exports of upstream inputs.<sup>50</sup> However, according to OECD TiVA estimates, Chinese value-added in Mexican automotive exports declined from 1.7 percent in 2013 to 1.4 percent in 2020 (figure 6).<sup>51</sup> This number is well below Chinese content in total Mexican exports (4.3 percent). However, an alternative methodology for estimating imported content in vehicle production that looks at automotive imports as a share of the domestic value of vehicle production, estimates Chinese content in Mexican vehicle production increased from 3.2 percent in 2013 to 4.3 percent in 2020, before rapidly increasing to 5.0 percent in 2023.<sup>52</sup> Despite this increase, Chinese content still appears to be significantly less than the United States, which accounted for 24.4 percent.<sup>53</sup> This methodology only includes automotive-specific goods, so it may show more downstream content from China than TiVA but less upstream content (such as metal or plastics). A value-added model like TiVA accounts for use of imported upstream content that is not necessarily automotive-specific in the creation of automotive parts, while the simpler methodology only includes automotive-specific imports.

**Figure 6:** China’s domestic value-added share of Mexican automotive content, 2013–23

In percentages



Source: OECD, TiVA 2023; and Author calculation using data from S&P Global and OICA.

<sup>50</sup> Bhasin and Kapoor, “Impact of Outward FDI on Home Country Exports,” January 1, 2021, 1150–51.

<sup>51</sup> Data for 2021 and 2022 are not yet available. OECD TiVA 2023 edition: Principal Indicators.

<sup>52</sup> Chinese content in Mexican vehicle exports was estimated by dividing the value of Mexican vehicle production (units of production times unit value of exports by the value of Mexican automotive parts imports from China.

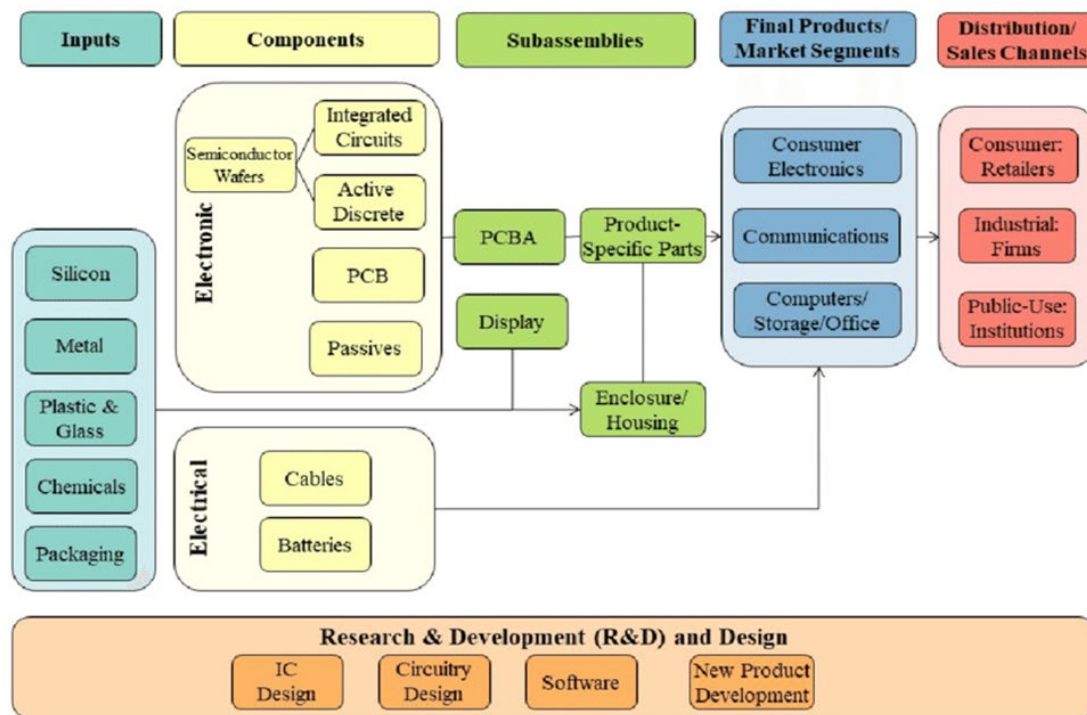
<sup>53</sup> This includes only HS subheadings that are exclusively or primarily vehicle parts. For a full list of HS subheadings included, see table F.5 of USITC, “USMCA Automotive ROOs 2023,” June 2023. S&P Global Market Intelligence, automotive parts, accessed February 29, 2024; OICA, Vehicle Production Statistics, 2013–2023.



## Electronics case study

While less developed than the Mexican automotive industry, the Mexican electronics industry is an increasingly important part of the complex global supply chain, particularly in the North American market (figure 7).<sup>54</sup> It plays a significant role in exports of several consumer electronic product categories: telephone sets, including smartphones (HS 8517); automatic data processing machines and units thereof (HS 8471); and television receivers, including video monitors and video projects (HS 8528) (table 1).<sup>55</sup> Mexico also produces and exports semiconductors and other critical components (e.g., liquid crystal displays, printed circuit boards, and connectors) for products in all electronics digests. It provides final assembly, testing, and packaging services (ATP), focusing on the latter. According to industry observers, Mexico's strategic location, emerging technological capabilities, and low production costs make it an attractive partner for ATP of semiconductors produced in the United States and for North American companies that rely heavily on sophisticated chips.<sup>56</sup>

**Figure 7:** Global Value Chain for Electronic Products



Source: Frederick, Stacey and Penny Bamber. "Korea in Global Value Chains: Pathways for Industrial Transformation," 2017.

<sup>54</sup> Mexico is the second-largest exporter of electronics to the United States. The main export destinations for Mexican electronics are the United States and Canada. S&P Global Market Intelligence, accessed February 29, 2024.

<sup>55</sup> In 2022, the three largest consumer electronics segments/categories, by worldwide revenue, were: 1) telephones (64.2 percent); 2) computing (29.7 percent); and 3) televisions, including video projectors (15.1 percent). Statista, "Consumer Electronics - Worldwide," accessed July 24, 2024.

<sup>56</sup> Texas Instruments, Infineon, and Skyworks operate semiconductor ATP facilities in Mexico. [These facilities may provide a foundation for further growth.](#) Miller and Talbot, "Mexico's Microchip Advantage," August 28, 2023; Gonzalez Henrichsen, "The Future of Semiconductor Chip Manufacturing In Mexico," February 14, 2024.

**Table 1** Leading consumer electronic product categories, 2022, by export value and percentage from Mexico.

In billions of dollars and percentages.

Product category and HS heading	Mexican exports (\$ billion)	Global exports (\$ billion)	Mexican exports (percent)
Television receivers, including video monitors and video projects (8528)	13.8	101.5	13.6
Automatic data processing machines and units thereof (8471)	43.0	439.0	9.8
Telephone sets, including smartphones (8517)	13,313.8	622.2	2.1

Source: International Trade Centre, "International trade in goods statistics by product, Exports 2001-2023, accessed June 24, 2024.

## Chinese Electronics Investments

From 2013 to 2023, Chinese firms made 22 greenfield investments in Mexico's electronics industry per FDI Markets.<sup>57</sup> Of those, 13 (59.0 percent) occurred from 2019 to 2023. Major Chinese companies have established and expanded facilities in Mexico to produce and assemble telephones, computers, televisions, and other electronics for export to the rest of the North American market. In 2015, Hisense acquired Sharp's TV factory in Mexico for \$23.7 million with rights to use the 'Sharp' brand name and all its channel resources in the Americas and, in 2016, invested an additional \$30 million in the factory.<sup>58</sup> In 2020, Lenovo opened a factory that makes cloud computer servers for which it imports key components from China.<sup>59</sup> In 2022, Xiaomi opened an 11,000 square meter manufacturing and distribution center.<sup>60</sup> According to one analysis, the value of Chinese investment projects in Mexico's electronics sector more than doubled from \$355 million in 2013–17 (11.6 percent of Mexican electronics FDI) to \$805 million in 2018–22 (17.9 percent).<sup>61</sup> Relatedly, import data for two of the three product categories suggests that Chinese imports are increasingly intermediate inputs used in the Mexican production of final goods. Specifically, Mexican imports from China of the HS headings for phones (HS 8517) and computers (HS 8471) are increasingly made up of parts and components (figure 8).<sup>62</sup> From 2013 to 2023, parts and components' share of Mexican imports of phones and computers from China rose from 36.8 to 46.3 percent, and from 34 to 46.6 percent, respectively.

<sup>57</sup> FDI Markets, ICT & Electronics, accessed October 2024.

<sup>58</sup> BorderNow, "Hisense establishes in Mexico its largest plant outside of China," August 25, 2015; Reilly, "Hisense to buy Sharp America in \$23.7M deal," August 2, 2015;

<sup>59</sup> Goodman, "Why Chinese Companies Are Investing Billions in Mexico," June 20, 2023.

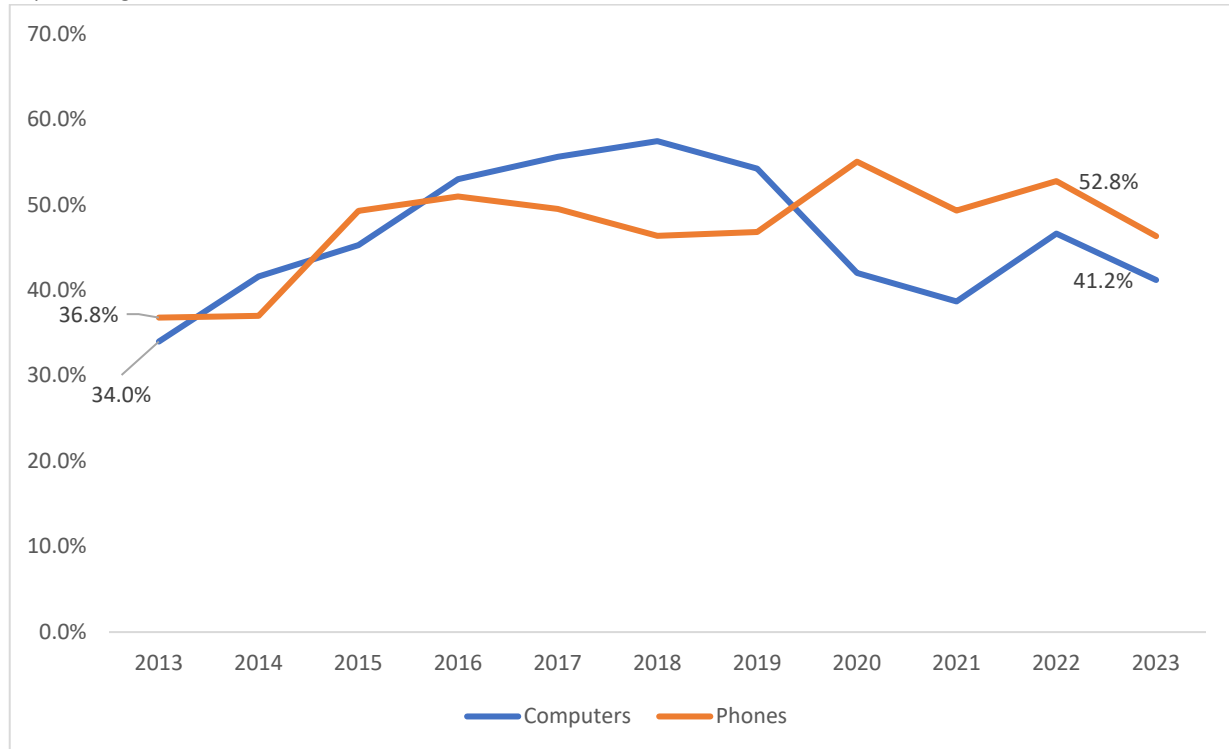
<sup>60</sup> Solili, "Xiaomi opens new warehouse and distribution center in Mexico," June 13, 2022.

<sup>61</sup> Ray, U.S.-China Economic and Security Review Commission, Consumer Products from China, March 1, 2024, 6.

<sup>62</sup> This analysis counts the following as intermediates: for telephones (8517.62, 8517.69, 8517.70, 8517.71, and 8517.79); computers (8471.60, 8471.70, 8471.80, and 8471.90); and televisions (8528.49.07, 8528.49.08, 8528.49.09, 8528.59.04, 8528.71.01, 8528.71.02, 8528.71.03, 8528.71.04, and 8528.72.07). S&P Global Market Intelligence, accessed April 21, 2024. For more see Appendix A.

**Figure 8:** Share of Mexican imports of phones and computers from China accounted for by intermediates, 2013–2023

In percentages



Source: S&P Global Market Intelligence, intermediates in computers (8471) and phones (8517), accessed August 14, 2024. See footnote 47 for a complete list of which subheadings are intermediates within each HS heading.

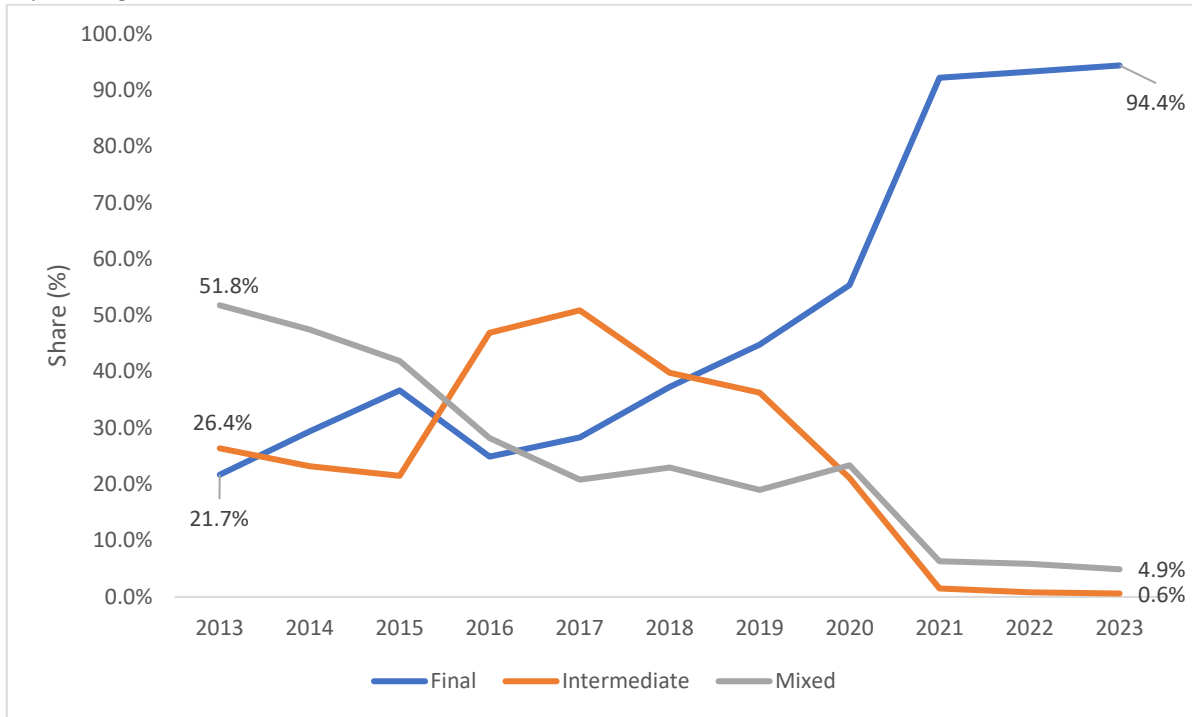
Conversely, Mexican television imports from China appear to be increasingly made up of completed televisions. During 2013–23, intermediate goods in Mexican imports of televisions from China (8528) declined from 51.8 percent to 4.9 percent (figure 9). Additionally, declines in Mexican imports of specific subheadings from China correlate with increases from other countries where Chinese FDI has dramatically increased. For example, Mexican imports of Other Input or Output units (8471.90) from China fell by \$5.7 million to \$1.6 million but such imports increased significantly from Taiwan (\$345,469 in 2012 to \$2.1 million in 2023), Malaysia (from \$23,000 to \$525,000), and Vietnam (from \$42,000 to \$403,000).<sup>63</sup> Increased imports from these countries may reflect Chinese investment in intermediate production in other parts of Asia to supply Mexico.<sup>64</sup>

<sup>63</sup> S&P Global Market Intelligence, “HS subheading 8471.90, Other input or output units,” accessed April 23, 2024; During 2013–2023, the top sectors for Chinese investment in these four countries (by project) were electronic components (69); automotive components (42); communications (39); and industrial equipment (31), FDI Markets, accessed October 7, 2024.

<sup>64</sup> Bhasin and Kapoor, “Impact of Outward FDI on Home Country Exports,” January 1, 2021, 1150–51.

**Figure 9:** Share of Mexican television imports from China accounted for by final, intermediate, and mixed, 2013–2023

In percentages

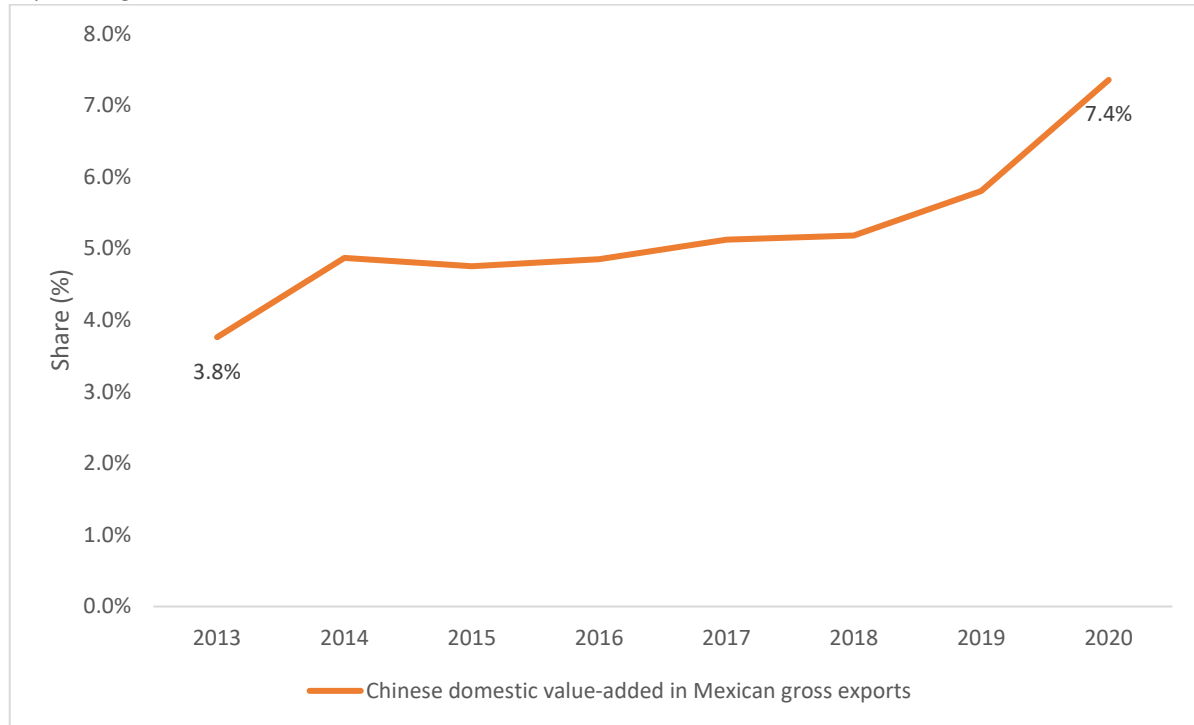


S&P Global Market Intelligence, intermediates in televisions (8528), accessed August 14, 2024. See footnote 47 for more.

China’s value-added in Mexican electronic exports increased, particularly after 2018 (figure 10). From 2013 to 2020, China moved from being the fourth- to the second-largest contributor of value-added in Mexican exports of computer, electronic, and optical products.

**Figure 10:** China’s domestic value-added share of Mexican exports of computers and electronic products, 2013–20.

In percentages.



Source: OECD, TiVA 2023 edition: Principal Indicators (accessed February 26, 2020).

Note: The electronics sector contains a variety of products, preventing the calculation to that done in figure 6.

While Chinese FDI in Mexico’s electronics industry increased considerably after 2018, it was still modest relative to U.S. FDI in Mexico’s electronics sector.<sup>65</sup> Nevertheless, the growth of Chinese FDI into Mexico’s electronics industry may facilitate Chinese content indirectly entering the U.S. market via U.S. imports of electronics from Mexico which contain increased Chinese content.<sup>66</sup>

<sup>65</sup> No significant supply-chain shifts had materialized by the end of 2022.

<sup>66</sup> Increased U.S. market shares of Vietnam, Thailand, and Taiwan are also associated with significant growth in both Chinese FDI and imports of Chinese components; An analysis of FDI and trade in 14 countries found that with each dollar of outward FDI, two dollars of additional exports were produced. Fontagné, “Foreign Direct Investment and International Trade,” 1999, 5.

## Conclusion

Chinese investment in Mexico's automotive and electronics industries may enable Chinese companies to legally assemble products in Mexico containing significant amounts of Chinese content and export to the United States while paying Mexico-specific tariffs instead of China-specific tariffs. Tariff rates on U.S. automotive and electronic imports from Mexico may be lower than U.S. imports from China both because of both USMCA as well as any China-specific duties the United States has in place. It appears that at least some Chinese manufacturers in both sectors, particularly automotive, are already taking advantage of this opportunity and more are likely to do so. Broader trade data also appears to show an increase in exports of intermediate goods to Mexico, possibly supporting Chinese assembly in Mexico. Some of this assembly may be for the Mexican domestic market, but many manufacturers have long used Mexico as a platform for exports to the rest of North America.

# Bibliography

- Bhasin, Niti and Kanika Kapoor. "Impact of Outward FDI on Home Country Exports." *International Journal of Emerging Markets*, January 1, 2021, 1150–1175. <https://doi.org/10.1108/IJOEM-05-2017-0160>.
- BorderNow. "Hisense establishes in Mexico its largest plant outside of China." August 25, 2015. <https://border-now.com/hisense-establishes-in-mexico-its-largest-plant-outside-of-china/>.
- Brown, Sherrod, Mike Braun, Robert Casey, and Marco Rubio. Letter to President Biden, September 17, 2024. <https://www.brown.senate.gov/imo/media/doc/letter-to-biden-re-mexicos-steel-surge-and-chinas-country-hopping.pdf>.
- "Visualizing China's Dominance in Battery Manufacturing (2022-2027P)." Visual Capitalist, January 19, 2023. <https://www.visualcapitalist.com/chinas-dominance-in-battery-manufacturing/>. CBP, Customs Rulings Online Search System, accessed September 6, 2024. <https://rulings.cbp.gov/home>.
- Center for Automotive Research (CAR). Book of Deals, accessed February 2024. <https://www.cargroup.org/acp-portal/>.
- Co-Production International, Inc., "Hisense Targets American TV Market With Mexican Factory." March 8, 2016. <https://www.co-production.net/mexico-manufacturing-news/hisense-american-tv-market-mexican-factory>.
- FDI Markets. Chinese automotive and electronics investments in Mexico, 2019-2023, accessed February 2024 and October 2024. <https://www.fdimarkets.com/>
- Fontagné, Lionel. "Foreign Direct Investment and International Trade: Complements or Substitutes?" *Organization for Economic Cooperation and Development (OECD) Science, Technology and Industry Working Papers*, No. 1999/03, OECD, 1999. <https://doi.org/10.1787/788565713012>.
- Frederick, Stacey, Penny Bamber, Lukas Brun, Jaehan Cho, Gary Gereffi and Joonkoo Lee. "Korea in Global Value Chains: Pathways for Industrial Transformation," September 2017. <https://hdl.handle.net/10161/15985>.
- Gonzalez Henrichsen, Jorge. "The Future of Semiconductor Chip Manufacturing In Mexico." *Forbes*, February 14, 2024. <https://www.forbes.com/sites/forbesbusinesscouncil/2024/02/14/the-future-of-semiconductor-chip-manufacturing-north-americas-opportunity-with-mexico/?sh=4c1ace2c5466>.
- Goodman, Peter. "Why Chinese Companies are Investing Billions in Mexico." *The New York Times*, June 20, 2023. <https://www.nytimes.com/2023/02/03/business/china-mexico-trade.html>.
- Hersh, Adam S. "EPI Comments to the Office of the United States Trade Representative on the US-Mexico-Canada Agreement with Respect to Automotive Goods." Economic Policy Institute, January 22, 2024. <https://www.epi.org/publication/us-mexico-canada-agreement/>.

## Bibliography

- International Trade Centre. "International trade in goods statistics by product, Exports 2001-2023," accessed June 24, 2024. <https://intracen.org/resources/data-and-analysis/trade-statistics>.
- International Union, United Automobile, Aerospace & Agricultural Implement Workers of America. "UAW's Public Comment on Operation of the United States-Mexico-Canada Agreement With Respect To Trade in Automotive Goods." January 17, 2024. <https://www.regulations.gov/comment/USTR-2023-0013-0013>.
- Ji, Siqi. "Mexico Scrambles to Reassure Chinese Investors amid Trump Tariff Threats." South China Morning Post, November 28, 2024. <https://www.scmp.com/economy/global-economy/article/3288524/mexico-scrambles-reassure-chinese-investors-amid-trump-tariff-threats>.
- Lawder, David. "US, Mexico Move to Thwart China Circumvention of Tariffs | Reuters." July 10, 2024. <https://www.reuters.com/markets/commodities/us-mexico-move-thwart-china-circumvention-us-steel-aluminum-tariffs-2024-07-10/>.
- Mexico. Tariff Schedule of Mexico (accessed September 5, 2024). [http://www.sice.oas.org/tpd/tpp/final\\_texts/english/MEX\\_Tariff\\_Sched.pdf](http://www.sice.oas.org/tpd/tpp/final_texts/english/MEX_Tariff_Sched.pdf).
- Miller, Chris, and David Talbot. "Mexico's Microchip Advantage: The Right Way to Shift the Semiconductor Supply Chain Away From China." Foreign Affairs, August 28, 2023. <https://www.foreignaffairs.com/mexico/mexicos-microchip-advantage-semiconductor-china>.
- Murray, Christine, Amanda Chu, and Edward White. "US Concern over Mexico Attracting Chinese Electric Vehicle Factories." *Financial Times*, December 17, 2023. <https://www.ft.com/content/fbd270d1-c688-4300-bd4e-f1eee1869196>.
- OECD.Stat, FDI financial flows - By partner country, BMD4, accessed February 21, 2024. [https://data-explorer.oecd.org/vis?tm=FDI%20financial%20flows&pg=0&snb=12&df\[ds\]=dsDisseminateFinalDMZ&df\[id\]=DSD\\_FDI%40DF\\_FDI\\_FLOW\\_AGGR&df\[ag\]=OECD.DAF.INV&df\[vs\]=1.0](https://data-explorer.oecd.org/vis?tm=FDI%20financial%20flows&pg=0&snb=12&df[ds]=dsDisseminateFinalDMZ&df[id]=DSD_FDI%40DF_FDI_FLOW_AGGR&df[ag]=OECD.DAF.INV&df[vs]=1.0).
- Oré, Diego. "Exclusive: Mexico, Facing US Pressure, Will Halt Incentives to Chinese EV Makers." Reuters, April 18, 2024. <https://www.reuters.com/business/autos-transportation/mexico-facing-us-pressure-will-halt-incentives-chinese-ev-makers-2024-04-18/>.
- Organization for Economic Cooperation and Development (OECD). TiVA 2023 edition: Principal Indicators (accessed February 26, 2020). [https://data-explorer.oecd.org/vis?tm=tiva&pg=0&snb=14&df\[ds\]=dsDisseminateFinalDMZ&df\[id\]=DSD\\_TIVA\\_MAINLV%40DF\\_MAINLV&df\[ag\]=OECD.STI.PIE&df\[vs\]=1.0](https://data-explorer.oecd.org/vis?tm=tiva&pg=0&snb=14&df[ds]=dsDisseminateFinalDMZ&df[id]=DSD_TIVA_MAINLV%40DF_MAINLV&df[ag]=OECD.STI.PIE&df[vs]=1.0).
- Palmer, Doug. "Mexican Official Says Government Working to Address Chinese Investment Concerns." November 20, 2024. <https://subscriber.politicopro.com/article/2024/11/mexican-official-says-working-to-address-chinese-investment-concerns-00190725>.
- Pérez, Santiago. "Mexico Wants to Curb Chinese Imports With Help From U.S. Companies." *Wall Street Journal*, October 8, 2024. <https://www.wsj.com/economy/trade/mexico-wants-to-curb-chinese-imports-with-help-from-u-s-companies-bf169302>.



- Privacy Shield. "Mexico - Trade Agreements." Accessed April 17, 2024.  
<https://www.privacyshield.gov/ps/article?id=Mexico-Trade-Agreements>.
- Ray, Rebecca. U.S.-China Economic and Security Review Commission. Consumer Products from China: Safety, Regulations, and Supply Chains. March 1, 2024.  
[https://www.uscc.gov/sites/default/files/2024-03/Rebecca\\_Ray\\_Testimony.pdf](https://www.uscc.gov/sites/default/files/2024-03/Rebecca_Ray_Testimony.pdf).
- Reilly, Claire. "Hisense to buy Sharp America in \$23.7M deal." CNET, August 2, 2015.  
<https://www.cnet.com/tech/tech-industry/hisense-to-buy-sharp-america-in-23-7-million-deal/>.
- Solili. "Xiaomi Opens New Warehouse and Distribution Center in Mexico," June 13, 2022.  
<https://www.solili.mx/noticias/xiaomi-estrena-nuevo-almacen-y-centro-de-distribucion-en-mexico/4879/?lang=en>.
- S&P Global Market Intelligence. Global Trade Analytics Suite (GTAS) database, accessed various dates.  
<https://www.spglobal.com/marketintelligence/en/mi/products/maritime-global-trade-analytics-suite.html>.
- Statista. "Consumer Electronics - Worldwide." Statista. Accessed July 24, 2024.  
<https://www.statista.com/outlook/cmo/consumer-electronics/worldwide>.
- U.S. Customs and Border Patrol (CBP). "What is a Ruling Letter?." accessed September 6, 2024.  
<https://www.cbp.gov/trade/rulings/ruling-letters>.
- U.S. Department of the Treasury. "Secretary of the Treasury Janet L. Yellen and Mexico's Secretary of Finance and Public Credit Rogelio Ramírez de la O Announce Intent to Establish Bilateral Working Group on Foreign Investment Review." U.S. Department of the Treasury, March 19, 2024. <https://home.treasury.gov/news/press-releases/jy1965>.
- U.S. International Trade Commission (USITC). *Harmonized Tariff Schedule of the United States (2024) Basic Edition*. Publication Number 5483. Washington, DC: USITC, January 2024.  
<https://hts.usitc.gov>.
- U.S. International Trade Commission (USITC). *USMCA Automotive Rules of Origin: Economic Impact and Operation, 2023 Report*. USITC Publication 5443. June 30, 2023.  
<https://usitc.gov/publications/332/pub5443.pdf>.
- U.S. International Trade Commission Interactive Tariff and Trade DataWeb (USITC DataWeb)/U.S. Census Bureau (Census), accessed various dates. <https://dataweb.usitc.gov>.
- Wards Intelligence. "Mexico Car and Truck Production by Manufacturer, 1985-2023." March 29, 2024.  
<https://wardsintelligence.informa.com/wi060682/mexico-car-and-truck-production-by-manufacturer-19852023>.
- Washington International Trade Association, and Asia Society. "What's Driving Chinese Investment into the Mexican Automotive Sector?" WITA. March 13, 2024. <https://www.wita.org/event-videos/chinese-mexican-auto-sector/>.
- World Trade Organization (WTO). "Global Value Chain Development Report 2023: Resilient and Sustainable GVCs in Turbulent Times." 2023.  
[https://www.wto.org/english/res\\_e/publications\\_e/gvc\\_dev\\_rep23\\_e.htm](https://www.wto.org/english/res_e/publications_e/gvc_dev_rep23_e.htm).

# Appendix A Intermediate Electronics Subheadings

The Table A.1 below shows electronics subheadings that the authors classified as intermediates for the purposes of this paper. The authors believe that goods imported under these subheadings are consumed in the process of making electronics.

**Table A.1** Intermediate electronics subheadings

Subheading	Electronics category	Description
8517.62	Telephones	Machines for the reception, conversion and transmission or regeneration of voice, images or other data, including switching and routing apparatus
8517.69	Telephones	Apparatus for transmission or reception of voice, images or other data, other than base stations or machines listed in 8517.62.
8517.70	Telephones	Phone parts
8517.71	Telephones	Aerials and aerial reflectors of all kinds; parts suitable for use therewith
8517.79	Telephones	Other phone parts
8471.60	Computers	Input or output units, whether or not containing storage units in the same housing
8471.70	Computers	Storage units
8471.80	Computers	Other units of automatic data processing machines
8471.90	Computers	Other
8528.49.07	Televisions	Incomplete or unfinished
8528.49.08	Televisions	Color audiovisual systems, built-in, for the control of access through multiple video screens
8528.49.09	Televisions	Black and white audiovisual systems, built-in, for the control of access through multiple video screens
8528.59.04	Televisions	Incomplete or unfinished
8528.71.01	Televisions	Incomplete or unfinished
8528.71.02	Televisions	Satellite microwave or signal receiver, with operating frequency up to de 4.2 GHz and maximum 999 television channels.
8528.71.03	Televisions	Satellite microwave receiver, consisting of electronic satellite localizer, download converter, receiver the operating frequency of which is of 3.7 to 4.2 GHz, low noise amplifier (LNA), wave guides, polarotor and power supply trumpet.

<b>Subheading</b>	<b>Electronics category</b>	<b>Description</b>
8528.71.04	Televisions	Satellite microwave receiver, consisting of a download converter with an operation frequency from 11.7 to 14.5 GHz, and a receiver with an operation frequency not exceeding 4.2 Ghz
8528.72.07	Televisions	Incomplete or unfinished

Sources: USITC, Harmonized Tariff Schedule (2024) Basic Edition, January 2024; Mexico, Tariff Schedule of Mexico (accessed September 5, 2024).

Note: Intermediates for televisions are at the tariff line level, so all lines shown are from Mexico

