The auto industry and NAFTA-links between the U.S. and Mexico

U.S.-Mexico ties in the 21st century: trade and immigration in a new era

Federal Reserve Bank of Dallas
May 12, 2017

Thomas Klier
Senior Economist and Research Advisor
Federal Reserve Bank of Chicago
thomas.klier@chi.frb.org

Disclaimer
The analysis and conclusions set forth are those of the authors and do not indicate concurrence by other members of the research staff or the Federal Reserve Bank of Chicago
Summary

• Today the auto industry essentially knows no borders within North America
  – 62.5% NAFTA content required to avoid tariffs
  – Mexico as the low labor cost production location

• Mexico’s strong growth in production is driven by exports

• Industry linkages between the U.S. and Mexico are extensive
North America’s auto production footprint

Light Vehicle Production: 2016

Assembly plants scaled by units of production

- 750,000
- 420,000
- 20,000

Miles

0 200 400 600
Parts and vehicle assembly co-locate

Light Vehicle Production: 2016

Assembly plants scaled by units of production

- 750,000
- 420,000
- 20,000
Most vehicles sold in U.S. are made in N.A.

U.S. light vehicle sales by major production region, %
Mexico is now larger than Canada

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>16</td>
<td>17</td>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>Mexico</td>
<td>6</td>
<td>11</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>U.S.</td>
<td>78</td>
<td>72</td>
<td>64</td>
<td>67</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Vehicles (millions)</td>
<td>14.9</td>
<td>17.2</td>
<td>11.9</td>
<td>17.7</td>
</tr>
</tbody>
</table>
Mexico’s auto industry: pre-NAFTA

• Long history of vehicle production in Mexico
  – Model T (1925); GM and Chrysler in 1930s
  – 15 carmakers operated low volume assembly plants
  – No Mexican-owned carmaker

• Importance of industry-specific trade policy
  – First: import substitution, later: export promotion
  – By late 60s: 5 producers in Mexico: Detroit 3 plus Nissan and VW

• Note: Vehicle production in Mexico:
Mexico’s auto industry at NAFTA

• By ‘95: D3 each operate two assembly plants, Nissan (2), VW (1)
  – Original Detroit 3 plants have been replaced
• NAFTA removes trade barriers and quotas over 10-year transition period (1995-2004)
• Mexico is becoming fully integrated into North-American production space (started slowly, in 80s)
  • E.g.: PT Cruiser exclusively produced in Mexico from 2001-2010
• Until 2004 only the 5 “legacy” carmakers benefit from NAFTA
Mexico’s auto industry since 2004

- Mexico pursues many free trade agreements
- BMW, Daimler, Kia (Hyundai subsidiary), Mazda, Toyota, Audi (VW division) decide to assemble vehicles in Mexico
- The legacy carmakers open additional assembly plants
- Assembly plant count increases from 11 in 2004 to 21 in 2019. Only two of those are by Detroit 3
Exports drive Mexico’s strong growth

Light vehicle production in Mexico

Production has increased by 2.5 million units since 1995

<table>
<thead>
<tr>
<th>OEM</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nissan</td>
<td>24</td>
</tr>
<tr>
<td>GM</td>
<td>21</td>
</tr>
<tr>
<td>FCA</td>
<td>13</td>
</tr>
<tr>
<td>VW</td>
<td>12</td>
</tr>
<tr>
<td>Ford</td>
<td>11</td>
</tr>
<tr>
<td>Others</td>
<td>19</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

2016 production
What is produced in Mexico?

LV production in Mexico, by segment, 1995 vs 2016

<table>
<thead>
<tr>
<th>Light Vehicle Model Segment</th>
<th>1995</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Pickup</td>
<td></td>
<td>661,421 [19%]</td>
</tr>
<tr>
<td>Small Pickup</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Van</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large and Luxury CUV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mid-Size CUV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small CUV</td>
<td>612k</td>
<td></td>
</tr>
<tr>
<td>Large and Luxury Car</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mid-Size Car</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small Car</td>
<td></td>
<td>1.7 million units [48%]</td>
</tr>
</tbody>
</table>

Size of circle scaled to production volume
Who produces what?
LV production in Mexico, by segment, 2016

Size of circle scaled to production volume

Ford  GM & Chrysler  VW & Nissan

Small Car

Mid-Size Car

Small CUV

Mid-Size CUV

Large and Luxury CUV

SUV

Van

Large Pickup

Small Pickup

661k

1,083,281
Exposure to Mexico varies by OEM

Share of NAFTA light vehicle production in Mexico, by OEM

<table>
<thead>
<tr>
<th>Carmaker</th>
<th>1995</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nissan</td>
<td>17</td>
<td>45</td>
</tr>
<tr>
<td>GM</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>FCA</td>
<td>8</td>
<td>18</td>
</tr>
<tr>
<td>VW</td>
<td>100</td>
<td>82</td>
</tr>
<tr>
<td>Ford</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>MEX total</td>
<td>6</td>
<td>20</td>
</tr>
</tbody>
</table>
So do destinations of Mexican production

Mexican production by destination region, 2012-14 average

- Stays in Mexico
- Exported to NAFTA
- Exported elsewhere
- Destination unknown
Majority of Mexican sales are imported

Mexican light vehicle sales by region of production, %

- Mexico
- U.S. & Canada
- Asia
- S. America
- Europe
Mind the supply chain and its linkages

Example: journey of a seatbelt

1. Produce nylon fibers
2. Dye and weave fibers
3. Cut and sew finished cloth
4. Fit finished seat belt into car
Supply chains extend across borders

The average Mexican content in U.S.-produced vehicles is about 13.5%.

The average U.S. content in Mexico-produced vehicles is about 26%.

Source: author’s calculations based on AALA data
U.S. Parts exports: Mexico growing

U.S. Motor Vehicle Parts Exports

Source: ITC dataweb
U.S. Parts imports: Mexico extends lead

Source: ITC dataweb
Summary: Mexico’s auto industry

- NAFTA ended Mexico’s many decades of barriers & quotas and opened the door to an integrated auto industry among Mexico, Canada, and U.S.

- Mexico’s growth in vehicle production is driven by exports.

- Within NAFTA, Mexico specializes in 2 segments: large pickups (19%) and small cars (48% in 2016).

- Increase in Mexico’s light vehicle production capacity since 2012 driven by foreign headquartered producers (import substitution of small cars and tariff savings on luxury product destined for export).
Summary: integration

- The auto industry in North America today is strongly integrated across both the US-CDN and the US-MEX border.

- Such linkages are strongest in the supply chain. In the process of adding content (all the way to the assembly of the finished vehicle), parts typically cross NAFTA borders multiple times.

- Specific policy proposals need to be assessed against that background.
NAFTA in the news

Donald Trump’s Nafta Plan Would Confront Globalized Auto Industry


Tens of thousands of parts that make up a vehicle often come from multiple producers in different countries and travel back and forth across borders several times.

Trump Threatens to Undo Nafta’s Auto Alley

“Then you have to play whack-a-mole with every low-cost country.”

by Brendan Greeley, David Welch, and Austin Weinstein

January 26, 2017 1:39 PM

From BloombergBusinessweek | Subscribe | Reprints

May 1, 2017

Mexico urges Trump to create Nafta powerhouse to rival China
Possible changes in U.S. trade policy

• From NAFTA to NAFTA
  – Raise the North American content requirement from the current 62.5%
  – Possibly introduce a U.S. peg
• Tariff on imports from Mexico
• Border tax
  – Envisioned as part of broad corporate tax reform
The auto industry and NAFTA-links between the U.S. and Mexico

U.S.-Mexico ties in the 21st century: trade and immigration in a new era
Federal Reserve Bank of Dallas
May 12, 2017

Thomas Klier
Senior Economist and Research Advisor
Federal Reserve Bank of Chicago
thomas.klier@chi.frb.org

Disclaimer
The analysis and conclusions set forth are those of the authors and do not indicate concurrence by other members of the research staff or the Federal Reserve Bank of Chicago