Maquiladora Industry: Past, Present and Future

Jesus Cañas

Miami FL, November 16, 2006
Latin America Looks East Regional Issues, Trends, and Progress in the Global Economy

*Federal Reserve Bank of Atlanta*

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Outline

– Industry Overview
– The maquila crisis: why?
  – Present
– Connection and economic impacts
– Future
  – The Asian Factor
– Some conclusions
INDUSTRY OVERVIEW
The Rise of Production Sharing

- The second half of the 20th century was marked by a dramatic increase in world trade.
- Between 1970 and 2000, world trade increased more than 370 percent.
- Production sharing has played a key role in the growth of world trade in recent decades.
- Intra-industry trade enhances the gains from trade through better exploitation of economies of scale.
- Increasing world output through savings in fixed costs.
- Firms have turned to production sharing to stay competitive.
- Production sharing, or trade in intermediate goods, represents more than $800 billion in trade annually.
- Maquiladora-led U.S.–Mexico trade is primarily intra-industry trade (or production sharing). About 80 percent of U.S. trade with Mexico is intra-industry.
Introduction to Maquiladoras

- End of the Bracero program in 1965

- Border Industrialization Program

  The maquiladora program was a measure to alleviate higher unemployment and growing poverty.

- By 1969, 147 companies were in place, accounting for 17,000 jobs

- The first two industrial parks were in Ciudad Juarez, Chih. Mexico and Nogales, Sonora Mexico

- RCA, Convertors, Sylvania, Centralab, Acapulco Fashion and Ampex were among the first U.S. companies to set up maquiladora operations.
What Is a Maquiladora?

• Typically, maquiladoras are foreign-owned, controlled or subcontracted manufacturing plants that process or assemble imported components for export.

• Maquiladora inputs are generally imported duty-free, and countries like the U.S. only tax the value-added portion of maquiladora exports.
Three Stages of Maquiladoras Growth

- Stage 1: 1981-1983
  - Employment: 15.7
  - Exchange Rate: -0.1

- Stage 2: 1985-1987
  - Employment: 10.7
  - Exchange Rate: -0.1

- Stage 3: 1991-2005
  - Employment: 10.7
  - Exchange Rate: 1.0

Graph shows the growth of employment and exchange rates in maquiladoras throughout the years.
Industry Evolution

– First-generation maquilas are typical of the earliest plants: highly labor-intensive with limited technology and dependent on decision from parent company (i.e. textile).

– Second-generation plants are oriented less toward assembly and more reliant on manufacturing processes (i.e. Auto-harnesses, TV sets, and electrical appliances).

– Third-generation maquilas are research oriented, with emphasis on design and development (i.e. Delphi’s Mexico Technical Center).
Importance to the Mexican Economy

– Maquiladora exports represent almost 50% of Mexico’s total exports

– The industry employs 10% of formal employment
Top Foreign-Exchange Generators

Billions of U.S. Dollars

- Oil
- Maquiladora
- Remittances
- Tourism

[Graph showing the contribution of various sectors to foreign-exchange generation over time from 1980 to 2005.]
THE CRISIS
Maquiladora Downturn

– From October 2000 to June 2002, more than 260,000 job losses, about 76 percent in border states.

– From May 2001 to June 2002, more than 420 plants closed, about three-fourths of them in border states.
Maquiladora follows US Industrial Production

Millions of workers

Maquiladora Employment

U.S. Industrial Production

U.S. IP
Current Employment Level

Level

1.22 million

YOY Growth

(110,000)

Current Employment Level


-30

-20

-10

0

10

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Production Increasing

- Real Value Added
- Employment

Graph showing the increase in millions of Real Value Added and Employment from 1990 to 2006.
Maquiladora Employment
Border vs. Interior States

*Seasonally adjusted*
THE CONECTION
## U.S.–Mexico Trade
(billions of U.S. dollars)

<table>
<thead>
<tr>
<th>Rank</th>
<th>NAICS code</th>
<th>Product</th>
<th>Amount</th>
<th>Rank</th>
<th>NAICS code</th>
<th>Product</th>
<th>Amount</th>
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<td>77</td>
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<td>20.7</td>
<td>3</td>
<td>75</td>
<td>OFFICE MACHINES AND AUTOMATIC DATA PROCESSING MACHINES</td>
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<td>4</td>
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<td>TELECOMMUNICATIONS AND SOUND RECORDING AND REPRODUCING APPARATUS AND EQUIPMENT</td>
<td>18.9</td>
<td>4</td>
<td>74</td>
<td>GENERAL INDUSTRIAL MACHINERY AND EQUIPMENT</td>
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<td>75</td>
<td>OFFICE MACHINES AND AUTOMATIC DATA PROCESSING MACHINES</td>
<td>7.1</td>
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<td>89</td>
<td>MISCELLANEOUS MANUFACTURED ARTICLES, N.E.S.</td>
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<tr>
<td>6</td>
<td>71</td>
<td>POWER GENERATING MACHINERY AND EQUIPMENT</td>
<td>6.7</td>
<td>6</td>
<td>33</td>
<td>PETROLEUM, PETROLEUM PRODUCTS AND RELATED MATERIALS</td>
<td>4.7</td>
</tr>
<tr>
<td>7</td>
<td>74</td>
<td>GENERAL INDUSTRIAL MACHINERY AND EQUIPMENT, N.E.S., AND MACHINE PARTS</td>
<td>6.7</td>
<td>7</td>
<td>71</td>
<td>POWER GENERATING MACHINERY AND EQUIPMENT</td>
<td>4.7</td>
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<td>8</td>
<td>84</td>
<td>ARTICLES OF APPAREL AND CLOTHING ACCESSORIES</td>
<td>6.3</td>
<td>8</td>
<td>76</td>
<td>TELECOMMUNICATIONS AND SOUND RECORDING AND REPRODUCING APPARATUS AND EQUIPMENT</td>
<td>4.3</td>
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<td>9</td>
<td>87</td>
<td>PROFESSIONAL, SCIENTIFIC AND CONTROLLING INSTRUMENTS AND APPARATUS</td>
<td>5.4</td>
<td>9</td>
<td>57</td>
<td>PLASTICS IN PRIMARY FORMS</td>
<td>4.2</td>
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<tr>
<td>10</td>
<td>93</td>
<td>SPECIAL TRANSACTIONS AND COMMODITIES NOT CLASSIFIED ACCORDING TO KIND</td>
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<td>10</td>
<td>69</td>
<td>MANUFACTURES OF METALS, N.E.S.</td>
<td>4.1</td>
</tr>
<tr>
<td>11</td>
<td>5</td>
<td>VEGETABLES AND FRUIT</td>
<td>4.5</td>
<td>11</td>
<td>51</td>
<td>ORGANIC CHEMICALS</td>
<td>3.7</td>
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<tr>
<td>12</td>
<td>82</td>
<td>FURNITURE AND PARTS</td>
<td>4.3</td>
<td>12</td>
<td>65</td>
<td>TEXTILE YARN, FABRICS, MADE-UP ARTICLES, N.E.S., AND RELATED PRODUCTS</td>
<td>3.7</td>
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<tr>
<td>13</td>
<td>69</td>
<td>MANUFACTURES OF METALS, N.E.S.</td>
<td>3.9</td>
<td>13</td>
<td>87</td>
<td>PROFESSIONAL, SCIENTIFIC AND CONTROLLING INSTRUMENTS AND APPARATUS</td>
<td>3.0</td>
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<tr>
<td>14</td>
<td>89</td>
<td>MISCELLANEOUS MANUFACTURED ARTICLES, N.E.S.</td>
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<td>14</td>
<td>68</td>
<td>NONFERROUS METALS</td>
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<tr>
<td>15</td>
<td>67</td>
<td>IRON AND STEEL</td>
<td>2.7</td>
<td>15</td>
<td>64</td>
<td>PAPER, PAPERBOARD, AND ARTICLES OF PAPER PULP</td>
<td>2.3</td>
</tr>
</tbody>
</table>

Subtotal: 148.0
All other: 22.2
Total: 170.2

Subtotal: 85.2
All other: 34.8
Total: 120.0
Texas and California Share of U.S. Exports

TX = $46.9 billion
CAL = $17.7 billion

Percent

Texas

California

1999 2000 2001 2002 2003 2004 2005
Texas Exports to Mexico

$ Billions of US dollars

TOTAL
Computers and Electronics
Electrical eq., Appliances
Industrial Machinery
Transportation Equipment
Manufacturing
Non-Manufacturing

U.S.–Mexico Border Linkages

- In general, a 10% increase in maquiladora activity in Mexican border cities
- Generates a 1.1% to 2.0% employment increase in the corresponding U.S. border cities side

“U.S.–Mexico Integration and Regional Economies: Evidence from Border-City Pairs“
Gordon H. Hanson
Journal of Urban Economics, 2001
THE FUTURE
# Wage Comparison

<table>
<thead>
<tr>
<th></th>
<th>Mexico</th>
<th>China</th>
<th>California</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hourly Average Salary</strong></td>
<td>$1.47</td>
<td>$0.47</td>
<td>$16.60</td>
</tr>
<tr>
<td><strong>Benefits and Taxes</strong></td>
<td>101%</td>
<td>52%</td>
<td>26%</td>
</tr>
<tr>
<td><strong>Total Integrated Salary</strong></td>
<td>$2.96</td>
<td>$0.72</td>
<td>$20.84</td>
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</table>

**Source:** Mexico Ministry of Economy

<table>
<thead>
<tr>
<th></th>
<th>Mexico</th>
<th>Sri Lanka</th>
<th>United States</th>
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</thead>
<tbody>
<tr>
<td><strong>Manufacturing Wages</strong></td>
<td>$2.08</td>
<td>$0.48</td>
<td>$20.32</td>
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</table>

**Source:** BLS

<table>
<thead>
<tr>
<th></th>
<th>Mexico</th>
<th>China</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manufacturing Wages</strong></td>
<td>$2.10</td>
<td>$0.25</td>
<td>$17.20</td>
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</tbody>
</table>

**Source:** International Labor Organization
### Chart 7

**Mexico is still Competitive**

<table>
<thead>
<tr>
<th>Competitive Factor</th>
<th>Mexico</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor Costs</td>
<td></td>
<td>X</td>
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<tr>
<td>Electricity Costs</td>
<td></td>
<td>X</td>
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<tr>
<td>Supplier Base</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Transportation costs and transit time</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Skilled labor/productivity</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>International telecommunication costs</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Technology transfer</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Manufacturing/management flexibility</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Protection of intellectual property</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Transparency in regulation/administration</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Free-trade agreements</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Maquiladora Employment Growth by Sector

(2006 job gains/losses)

- Electronics: 18,450
- Transportation: 7,729
- Textile: -4,253
- Furniture: 1,257
- Services: 3,710
- Chemical: 6,214
- Machinery: 1,906
- Toys: 1,285
- Food: 1,612
- Leather: 749

Number of jobs
Maquiladora Employment by Sector

Share
(2006 average)

- Electronics: 32%
- Transportation: 23%
- Textile: 14%
- Furniture: 5%
- Services: 4%
- Chemical: 3%
- Machinery: 2%
- Other: 17%
# FDI in Maquiladoras by Country of Origin

*(billions of US dollars)*

<table>
<thead>
<tr>
<th>Country</th>
<th>1994 – 2006</th>
<th>Share</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>TOTAL</td>
<td><strong>26,203</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>23,164</td>
<td></td>
<td>88.4</td>
</tr>
<tr>
<td>Japan</td>
<td>533</td>
<td></td>
<td>2.0</td>
</tr>
<tr>
<td>South Korea</td>
<td>366</td>
<td></td>
<td>1.4</td>
</tr>
<tr>
<td>Holland</td>
<td>358</td>
<td></td>
<td>1.4</td>
</tr>
<tr>
<td>Singapore</td>
<td>308</td>
<td></td>
<td>1.2</td>
</tr>
<tr>
<td>Switzerland</td>
<td>245</td>
<td></td>
<td>0.9</td>
</tr>
<tr>
<td>Canada</td>
<td>181</td>
<td></td>
<td>0.7</td>
</tr>
<tr>
<td>UK</td>
<td>172</td>
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<td>0.7</td>
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<tr>
<td>Finland</td>
<td>160</td>
<td></td>
<td>0.6</td>
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<tr>
<td>Spain</td>
<td>140</td>
<td></td>
<td>0.5</td>
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<tr>
<td>France</td>
<td>134</td>
<td></td>
<td>0.5</td>
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<tr>
<td>Germany</td>
<td>91</td>
<td></td>
<td>0.3</td>
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<tr>
<td>Taiwan</td>
<td>75</td>
<td></td>
<td>0.3</td>
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<tr>
<td>Caiman Islands</td>
<td>58</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>Italy</td>
<td>33</td>
<td></td>
<td>0.1</td>
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<tr>
<td>China</td>
<td>32</td>
<td></td>
<td>0.1</td>
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### Mexican Maquiladora Imports by Country of Origin

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</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>90.2</td>
<td>79.2</td>
<td>70.8</td>
<td>69.1</td>
<td>59.0</td>
<td>55.8</td>
<td>4.3</td>
</tr>
<tr>
<td>Asia without China and Japan</td>
<td>18.3</td>
<td>5.2</td>
<td>10.1</td>
<td>14.0</td>
<td>13.2</td>
<td>16.6</td>
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<td>China</td>
<td>0.5</td>
<td>0.9</td>
<td>2.1</td>
<td>4.2</td>
<td>8.3</td>
<td>11.1</td>
<td>10.6</td>
</tr>
<tr>
<td>Japan</td>
<td>3.2</td>
<td>2.5</td>
<td>6.4</td>
<td>8.4</td>
<td>6.5</td>
<td>8.0</td>
<td>8.1</td>
</tr>
<tr>
<td>Other</td>
<td>1.1</td>
<td>1.2</td>
<td>2.2</td>
<td>2.6</td>
<td>3.0</td>
<td>5.3</td>
<td>7.2</td>
</tr>
</tbody>
</table>
A New Maquiladora Model

– Emphasis on attracting/retaining high-tech plants.

– High complexity plants, tailored to high-end customers, with quick JIT response for customers in volatile markets.

– Investment in capital intensive plants.

– Full-fledged efforts toward vertical integration of the industry and more value-added production.

– Prompt leveraging and taking “overnight” advantage of new U.S. and global competitive factors.

– Maquiladoras must have their own business model with engineering, R&D at maquiladora level.

SOURCE: John Christman, Global Insight
Chief Competitive Sectors in the Future

– Automotive parts and components
– Aerospace
– Electronics (high-end, i.e. large LCD flat screen TVs)
– Software
– Metal mechanics
– Medical/hospital instruments and supplies

SOURCE: John Christman, *Global Insight*
Concluding Remarks

– A return to annual growth rates of double-digit is extremely unlikely, at least in the near future.

– As more capital-intensive manufacturing becomes the norm, employment growth will likely be slower than in the past, while wages should be higher.

– Hence, there is a structural component to the current downturn, 4th generation maquiladora?
Concluding Remarks-cont’d

– Low wage jobs are most at risk, most notably the apparel and some electronics sectors.

– Further, the maquiladora industry must focus on developing more efficient processes.

– Managers can no longer rely on peso devaluations to absorb increasing labor costs

– Identify regional comparative advantages; work together to maximize benefit

– Output growth and productivity, rather than jobs, will measure the success of the next generation of maquiladoras.
THANKS