Binational Industry Concentrations
Coahuila-Nuevo León-Tamaulipas-Texas Region

Christopher Wilson and Alma Bezares
Cluster Based Economic Development:
A Pro-Competition and Data Driven Way to Focus Economic Development Resources

Note: relies heavily on concepts developed by Michael Porter and Christian Ketels
Competing Trends

- Globalization: stretching supply chains out across the world
- Agglomeration: Clustering industries in a small geographic area
- Regionalization/Reshoring/Nearshoring: Somewhere in between. Not quite clusters but a countercurrent to full blown globalization.
Why Do Businesses Cluster?

• Access to Inputs: Suppliers build specialized supply chains to feed inputs to the industry. Specialized workforce develops in the area.

• To take advantage of (and drive the construction of) shared resources--scientific, physical infrastructure, informational infrastructure, natural resources, regulatory environment, etc.

• To meet a large or specialized local or regional demand.

• To capitalize on existing complimentary industries (i.e. wine-tourism-food nexus)
Role of Innovation

- Innovation drives productivity, which drives competitiveness.
- Healthy clusters have significant innovation benefits.
- The move away from a closed, in-house lab, model to an open innovation model inherent in global value chains (OEM works with suppliers and outside experts to innovate) ironically strengthens importance of geographically clustered networks.
Where do Cluster-Based Strategies Fit in to Overall Economic Development?

<table>
<thead>
<tr>
<th>Anti-Competition &quot;Industrial&quot; Policy</th>
<th>Cluster-Based Strategies</th>
<th>Macro and Overall Business Environment Improvements (Cross-Cluster Strategies)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitions and policies vary, but at its worst, can be:</td>
<td>• Data reveals existing industrial clusters with roots (not politically driven)</td>
<td>• Subregion, Region or Nation specific</td>
</tr>
<tr>
<td>• Firm Specific</td>
<td>• Industry/Cluster specific</td>
<td>• Pro-competition (robust business environment fosters competitive environment)</td>
</tr>
<tr>
<td>• Weakens Competition and thus incentives to improve</td>
<td>• Pro-competition (seeks diversity and numerous firms competing within sector)</td>
<td></td>
</tr>
<tr>
<td>• Politically driven</td>
<td></td>
<td>Examples: General Education, Responsible Fiscal and Monetary Policy, Trade Liberalization, Cutting Red-Tape, Simple Tax Code, General Infrastructure (overall highway network, broadband, etc.), Broad tax incentives</td>
</tr>
<tr>
<td>• Inconsistent across administrations</td>
<td></td>
<td>Examples: Specialized Education Programs, Industry Worker Training Programs, Specialized Infrastructure (port, pre-inspection), Business-Regulator Dialogue, Joint Marketing</td>
</tr>
<tr>
<td>Examples: Subsidies, Tariff Barriers, Negotiated tax incentives</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Supporting Cluster Development and Competitiveness

Principles:

• focus on improving productivity, not growing the size of the cluster
• Data-driven whenever possible
• Integrate cluster-based efforts with broader economic competitiveness enhancing efforts--complement and interact with, not replace other efforts
• Not creating clusters--facilitating their development
• Collaborative Government-Private Sector process. Also involving independent institutions, such as universities, is even better (Will be needed to support research and workforce development).
• In the border region, federal government may need to play a larger role given border management and other international issues. This is a good way to engage government as a partner.
Examples of Cluster-Enhancing Strategies

- Corporate Philanthropy to improve the business/social environment
- Trade Associations sharing costs (training facilities, some infrastructure investments, etc.)
- Courses for managers on regulatory affairs and best practices in the industry
- Create Industry-Based Groups/Trade Associations
- Create testing and standards infrastructure and organizations
- Government-Business dialogue on regulation of industry
- Businesses and trade groups work with local universities and technical schools to develop curricula
- Create university research centers and jointly fund research
- Support development of supplying industries and customer industries, strengthening the cluster-linkages across industries
- Joint marketing by trade associations
- Joint procurement
- Supporting focused scholarships to strengthen workforce and research/design/innovation capacity of the region
Industry-Based Groups

facilitate the flow of information and the definition of cluster-based strategies

• Industry Associations (company groups)
• Professional Associations (groups of individuals)
• Incubators, Accelerators, entrepreneurial networks
Cluster vs. Industry

- Clusters: Groups of firms and entities that are *linked* and *geographically proximate*
- We are identifying key industries, but we advocate the construction of strategies to support the clusters they are embedded in—upstream and downstream industries, educational institutions, etc.
Willingness to Upgrade

• With our methodology, we aim to identify binational, concentrated and dynamic industries as candidates to prioritize in economic development efforts
• Additionally, cluster-based prioritizations should take into account willingness to upgrade (Ketels, 2003)
Some Basic Numbers

Coahuila

- Land area: 151,595 sq. Km.
- Population: 2,748,341 inhabitants (2010)
- Average wage: $289.4 pesos/day ~ $22.77 USD/day (2015)
- Unemployment rate: 5.5% (April 2015)

Nuevo León

- Land area: 64,156 sq. Km.
- GDP: $949,244 million pesos ~ $74,684 million USD (2012)
- Average wage: $336 pesos/day ~ $26 USD/day (2015)
- Unemployment rate: 4.9% (April 2015)
Some Basic Numbers (2)

<table>
<thead>
<tr>
<th>Tamaulipas</th>
<th>Texas</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Land area= 80,249 sq. Km.</td>
<td>• Land area: 696,241 sq. Km.</td>
</tr>
<tr>
<td>• GDP: $400,892 Million pesos ~ $31,541 million USD (2012)</td>
<td>• GDP: $1,414 billion USD</td>
</tr>
<tr>
<td>• Average wage: $281.2 pesos/day ~$22.12 USD/day (2015)</td>
<td>• Average wage:$988 USD/week</td>
</tr>
<tr>
<td>• Unemployment rate: 4.8% (April 2015)</td>
<td>• Unemployment rate: 2.2% (April 2015)</td>
</tr>
</tbody>
</table>
The Region

• Definition
  – Coahuila: Acuña, Guerrero, Hidalgo, Jiménez, Nava, Ocampo, Piedras Negras;
  – Nuevo León: Anáhuac;
  – Tamaulipas: Guerrero, Nuevo Laredo;
  – Texas : Kinney, Maverick, Terrell, Val Verde, Webb, Zapata

• Total population: 1,187,749 inhabitants
  • Mostly concentrated in Acuña, Piedras Negras, Nuevo Laredo, and Webb county.
## At the Border

<table>
<thead>
<tr>
<th>Port Name</th>
<th>Year</th>
<th>Trucks</th>
<th>Trains</th>
<th>Buses</th>
<th>Bus Passengers</th>
<th>Personal Vehicles</th>
<th>Personal Vehicle Passengers</th>
<th>Pedestrians</th>
</tr>
</thead>
<tbody>
<tr>
<td>TX: Del Rio</td>
<td>2009</td>
<td>49500</td>
<td></td>
<td>6</td>
<td>1376413</td>
<td>2366725</td>
<td>61631</td>
<td></td>
</tr>
<tr>
<td>TX: Del Rio</td>
<td>2014</td>
<td>69048</td>
<td></td>
<td></td>
<td>1347713</td>
<td>2839645</td>
<td>104252</td>
<td></td>
</tr>
<tr>
<td>% change</td>
<td></td>
<td>39.49%</td>
<td></td>
<td></td>
<td></td>
<td>-2.09%</td>
<td>19.98%</td>
<td>69.16%</td>
</tr>
<tr>
<td>TX: Eagle Pass</td>
<td>2009</td>
<td>83254</td>
<td>1704</td>
<td>1364</td>
<td>22888</td>
<td>3005283</td>
<td>7103061</td>
<td>685080</td>
</tr>
<tr>
<td>TX: Eagle Pass</td>
<td>2014</td>
<td>136506</td>
<td>2728</td>
<td>1027</td>
<td>26682</td>
<td>2466385</td>
<td>5082478</td>
<td>856700</td>
</tr>
<tr>
<td>% change</td>
<td></td>
<td>63.96%</td>
<td>60.09%</td>
<td>-24.71%</td>
<td>16.58%</td>
<td>-17.93%</td>
<td>-28.45%</td>
<td>25.05%</td>
</tr>
<tr>
<td>TX: Laredo</td>
<td>2009</td>
<td>1382319</td>
<td>2716</td>
<td>43342</td>
<td>845629</td>
<td>5452111</td>
<td>12729210</td>
<td>4090191</td>
</tr>
<tr>
<td>TX: Laredo</td>
<td>2014</td>
<td>1947846</td>
<td>3758</td>
<td>41230</td>
<td>1020567</td>
<td>5250601</td>
<td>10335481</td>
<td>3447437</td>
</tr>
<tr>
<td>% change</td>
<td></td>
<td>40.91%</td>
<td>38.37%</td>
<td>-4.87%</td>
<td>20.69%</td>
<td>-3.70%</td>
<td>-18.81%</td>
<td>-15.71%</td>
</tr>
</tbody>
</table>

Source: Bureau of Transportation Statistics
Industry Mapping

- **Objective**: The idea behind this study is that the industries along the U.S.-Mexico border cannot be delimited to the national arena as they interact with industries across the border and jointly develop.
- **5 subregions**:
  - Cali-Baja
  - Arizona-Sonora
  - Paso del Norte
  - Coahuila-NL-Tamaulipas-Texas
  - Lower Rio Grande Valley
- The study intents to identify the concentration of the industries in the regions, analyze how dynamic are these industries across the time and verify if they are indeed binational.
Measuring Industrial Concentration

• What are the most important industries, in terms of employment, for the subregion of Coahuila-NL-Tamaulipas-Texas?

**Location Quotient**

\[
LQ = \left( \frac{\frac{E_{ij}}{E_i}}{\frac{E_{nal}}{E_{nal}}} \right)
\]

A ratio equal to one means that the industry in that region has the same share of employment relative to the binational share.

A ratio greater than one indicates that the local economy has a greater share of that industry than the reference economy.

– Important to promote regional competitiveness in industries that generate high levels of employment.
Methodology

• Analysis of industries by using the North American Industry Classification System (NAICS) → 4-digit codes identifying industry groups.

• Binational study at the county/municipio level: Sources: US Census Bureau and INEGI (2009)

• Assumption: similar industries in both sides of the border have the same needs in terms of human resources.
COAHUILA

Acuña, Guerrero, Hidalgo, Jiménez, Nava, Ocampo, Piedras Negras
Main Results

• 66 industries with LQ greater than 3
• 49 industries with LQ between 1.5 and 3
• 55 industries with LQ between 1 and 1.5
• These 170 industries concentrate more than 46,700 thousand jobs.

  – The municipio of Acuña has 33 industries with LQ greater than 1 that employ more than 20 thousand people.
  – Meanwhile, the municipio of Piedras Negras has 55 industries with high industrial concentration which generate almost 21 thousand jobs.
Municipio de Acuña- Most Concentrated Industries

- Forging and Stamping
- Household Appliance Manufacturing
- Motor Vehicle Parts Manufacturing
- Textile and Fabric Finishing and Fabric Coating Mills
- School and Employee Bus Transportation
- Agriculture, Construction, and Mining Machinery Manufacturing
- Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing
- Other Furniture Related Product Manufacturing
- Electric Lighting Equipment Manufacturing
- Other Support Services
Municipio de Acuña- Employment in Most Concentrated Industries

Municipio de Acuña
Piedras Negras—Most Concentrated Industries

- Electrical Equipment Manufacturing
- Motor Vehicle Parts Manufacturing
- Other Transportation Equipment Manufacturing
- Freight Transportation Arrangement
- School and Employee Bus Transportation
- Semiconductor and Other Electronic Component Manufacturing
- Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing
- Newspaper, Periodical, Book, and Directory Publishers
- Other Electrical Equipment and Component Manufacturing
- Junior Colleges

Graph showing the most concentrated industries in Piedras Negras.
Piedras Negras- Employment in Most Concentrated Industries
Other Results

- **Mining** is an important sector, with industries such as coal mining and **Nonmetallic Mineral Mining and Quarrying** highly concentrated in municipios such as Nava, Ocampo and Hidalgo.
- **Water collection, treatment and supply** is also a concentrated industry in most of the municipios of Coahuila located in the U.S.-Mexico border.
- **Dairy products manufacturing** is also a relevant industry in municipios such as Hidalgo, Ocampo and Acuña.
- Retail trade of groceries and food is one of the largest employers in both, Acuña and Piedras Negras, although it has a small LQ.
NUEVO LEÓN

Anáhuac
Main Results

• 17 industries with a higher level of concentration than 3
• 19 industries with LQ between 1.5 and 3
• 13 industries with a level of concentration between 1 and 1.5
• These 49 industries employ more than 2,400 people
Municipio de Anáhuac - Most Concentrated Industries

Anáhuac

- Retail trade of fuels, lubricating oils and greases
- Securities and Commodity Contracts Intermediation and Brokerage
- Wholesale trade of waste materials
- Rooming and Boarding Houses
- Retail trade of beverages, ice and tobacco
- Other Personal Services
- Motor Vehicle Parts Manufacturing
- Household and Institutional Furniture and Kitchen Cabinet Manufacturing
- Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly
- Freight Transportation Arrangement
Municipio de Anáhuac- Employment in Most Concentrated Industries

Anáhuac
Other Results

- Automotive Repair and Maintainance is another sector highly concentrated in Anáhuac, Nuevo León
- Retail trade of groceries and food is a sector that generates a large share of jobs in the municipio.
TAMAULIPAS

Guerrero, Nuevo Laredo;
Main Results

• 25 industries with a higher level of concentration than 3
• 23 industries with LQ between 1.5 and 3
• 30 industries with a level of concentration between 1 and 1.5
• These 78 industries generate almost 50 thousand jobs.
  – Nuevo Laredo has 53 industries with LQ higher than 1 that employ 49 thousand people.
Nuevo Laredo- Most Concentrated Industries

Nuevo Laredo

Audio and Video Equipment Manufacturing
Specialized Freight Trucking
Leather and Hide Tanning and Finishing
Retail trade of used goods
Other Electrical Equipment and Component Manufacturing
General Freight Trucking
Navigational, Measuring, Electromedical, and Control Instruments Manufacturing
Household Appliance Manufacturing
Freight Transportation Arrangement
Manufacturing and Reproducing Magnetic and Optical Media
Nuevo Laredo- Employment in Most Concentrated Industries

Nuevo Laredo

- Manufacturing and Reproducing Magnetic and Optical Media
- Freight Transportation Arrangement
- Household Appliance Manufacturing
- Navigational, Measuring, Electromedical, and Control Instruments Manufacturing
- General Freight Trucking
- Other Electrical Equipment and Component Manufacturing
- Retail trade of used goods
- Leather and Hide Tanning and Finishing
- Specialized Freight Trucking
- Audio and Video Equipment Manufacturing
Other Results

• Although it does not have one of the highest LQs in Nuevo Laredo, the **Motor Vehicle Parts Manufacturing** industry is the largest employer in the municipio.

• **Water collection, treatment and supply** has a large concentration index and is an important employer in the municipios of Guerrero and Nuevo Laredo.

• **Medical Equipment and Supplies Manufacturing** is an important employer with high LQ in the region.
TEXAS

Kinney, Maverick, Terrell, Val Verde, Webb, Zapata
Main Results

• 88 industries with LQ higher than 3
• 93 industries with LQ between 1.5 and 3
• 63 industries with LQ between 1 and 1.5
• These 244 industries generate more than 64,300 jobs.
  – Webb county has 61 industries with LQ higher than 1 that employ more than 46 thousand people.
Webb County- Most Concentrated Industries

Webb County

- Other Leather and Allied Product Manufacturing
- Support Activities for Mining
- Oil and Gas Extraction
- Support Activities for Rail Transportation
- Other Support Activities for Transportation
- Facilities Support Services
- General Freight Trucking
- Home Health Care Services
- Interurban and Rural Bus Transportation
- Freight Transportation Arrangement

The bars in the chart represent the concentration of different industries in Webb County. The highest concentration is in Freight Transportation Arrangement, followed by Home Health Care Services and Interurban and Rural Bus Transportation. Other industries show lower concentrations.
Webb County Employment in Most Concentrated Industries

![Webb County Employment Chart]

- Freight Transportation Arrangement
- Interurban and Rural Bus Transportation
- Home Health Care Services
- General Freight Trucking
- Facilities Support Services
- Other Support Activities for Transportation
- Support Activities for Rail Transportation
- Oil and Gas Extraction
- Support Activities for Mining
- Other Leather and Allied Product Manufacturing
Other Results

- **Home Health Care Services** is a large employer in the Maverick and Val Verde counties as well.

- **Hunting and Trapping** seems to be a sector highly concentrated with LQ’s greater than 50 in the Maverick, Kinney and Val Verde counties.

- **Support Activities for Mining** is an industry also concentrated in the counties of Zapata, Terrell and Webb.
  
  - It is worth mentioning that this industry includes activities such as drilling oil and gas wells.
COAHUILA-NUEVO LEÓN-TAMAULIPAS-TEXAS REGION
Main Results

• 39 industries with LQ higher than 3
• 29 industries with industrial concentration between 1.5 and 3
• 34 industries with LQ between 1 and 1.5
• In total, these industries generate almost 163,000 jobs.
  – This represents 68% of total employment in the Paso del Norte region.
Most Concentrated Industries in the Region

Coahuila-Nuevo León-Tamaulipas-Texas Region

- Wholesale trade of trucks and new parts for automobiles, pickup trucks and trucks
- Retail trade exclusively through Internet and printed catalogs, television and similar media
- Electrical Equipment Manufacturing
- Manufacturing and Reproducing Magnetic and Optical Media
- Audio and Video Equipment Manufacturing
- Leather and Hide Tanning and Finishing
- Motor Vehicle Parts Manufacturing
- Coal Mining
- Household Appliance Manufacturing
- Retail trade of used goods
- Freight Transportation Arrangement
Employment in Most Concentrated Industries in the Region

Coahuila-Nuevo León-Tamaulipas-Texas Region

- Freight Transportation Arrangement
- Retail trade of used goods
- Household Appliance Manufacturing
- Coal Mining
- Motor Vehicle Parts Manufacturing
- Leather and Hide Tanning and Finishing
- Audio and Video Equipment Manufacturing
- Manufacturing and Reproducing Magnetic and
- Electrical Equipment Manufacturing
- Retail trade exclusively through Internet and
- Wholesale trade of trucks and new parts for
# Industries at the Binational Level

<table>
<thead>
<tr>
<th>NAICS</th>
<th>Total Employees</th>
<th>LQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freight Transportation Arrangement</td>
<td>11386</td>
<td>23.82424631</td>
</tr>
<tr>
<td>Retail trade of used goods</td>
<td>1644</td>
<td>21.35564516</td>
</tr>
<tr>
<td>Household Appliance Manufacturing</td>
<td>2910</td>
<td>16.23343726</td>
</tr>
<tr>
<td>Coal Mining</td>
<td>2528</td>
<td>15.30836848</td>
</tr>
<tr>
<td>Motor Vehicle Parts Manufacturing</td>
<td>21813</td>
<td>14.03433613</td>
</tr>
<tr>
<td>Leather and Hide Tanning and Finishing</td>
<td>385</td>
<td>12.78109609</td>
</tr>
<tr>
<td>Audio and Video Equipment Manufacturing</td>
<td>1275</td>
<td>10.9126531</td>
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<tr>
<td>Manufacturing and Reproducing Magnetic and Optical Media</td>
<td>504</td>
<td>10.39268243</td>
</tr>
<tr>
<td>Electrical Equipment Manufacturing</td>
<td>2981</td>
<td>8.710621983</td>
</tr>
<tr>
<td>Retail trade exclusively through Internet and printed catalogs, television and similar media</td>
<td>35</td>
<td>8.509664845</td>
</tr>
<tr>
<td>Wholesale trade of trucks and new parts for automobiles, pickup trucks and trucks</td>
<td>194</td>
<td>8.501033679</td>
</tr>
</tbody>
</table>
Relevant sectors

• **4885- Freight Transportation Arrangement (greatest LQ):** An important industry for the region in both sides of the border in terms of LQ and employment, it is focused mainly on offering a combination of services spanning transportation modes.

• **3363-Motor Vehicle Parts Manufacturing (largest employer):** Another important manufacturing industry that employs a large share of the population, especially in the Mexican side of the border.
What’s next

• To identify how dynamic are those industries (changes in employment between 2009 and 2014)
• Analyze the binational interactions among the industries using trade data.

Limitations of the study

• Use of proxies for the total value of employment by industry for the United States
• Data not fully comparable (difference in codes 221, 42, 43, 44, 45, and 46→ water collection, treatment and supply, wholesale and retail trade; no government employees in the case of the U.S.)