OKLAHOMA INTERNATIONAL TRADE ANALYSIS: Supply Chain and Network Structure
The mission of the Wes Watkins Center for International Trade Development at OSU (CITD) is to bring the knowledge, network, and resources of OSU to make Oklahoma more globally competitive, increase trade, and create jobs to keep Oklahoma companies and students in the state to build their futures.
How we achieve the mission

• CITD collaborates across our networks to establish Oklahoma State University as a source for trade related education, research, and outreach.

• CITD provides trade assistance to facilitate Oklahoma companies' market expansion through our Small Business Development Center (SBDC) International Trade Center and other network partnerships.
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Introduction, Context, and Purpose

GLOBAL TRADE FELLOWS

• Adolfo Peña, Honduras
• Belem Carrasco Galvan, Mexico
• Darcy Elmore, Tulsa
• Maria Francesca Savino Diaz, Owasso

STAFF

• John Schoeneman
• Andrew Ranson
• Introduction and context
• State of Trade in Oklahoma
• Research Methodology & Tree Mapping
• Commodity analysis
  • Oil (2709)
  • Machinery (8412)
  • Cotton (5201)
• Q&A and Input
State of Trade in Oklahoma

Report
- Oklahoma's current trade environment
- Regions
- Patterns and Discrepancies
State of Trade in Oklahoma

Exports

Exports by OK

Imports

Imports by OK
State of Trade in Oklahoma

- **Service Exports**
  - Area of growth in Oklahoma in the last 15 years

- **Issues**
  - No identification System
  - Grouped in with goods

- **What next...**
  - Company level analysis
    - Identify ways in which companies keep track
  - Policy Action
    - Create/Identify a classification system
State of Trade in Oklahoma

Foreign Direct Investment

- Mexico
- United Kingdom
- France
Research Methodology

• To understand individual transactions, it is vital to understand the context it takes place in.

• The network includes trade in finished goods, but is dominated by global supply chains.
Oklahoma’s Top Exports (2018; Industries)
# Oklahoma’s Top Exports (2018; 4-digit)

<table>
<thead>
<tr>
<th>Category</th>
<th>Items</th>
</tr>
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<tbody>
<tr>
<td><strong>Elec Water, Space</strong></td>
<td>Turbojets, Turbopropellers &amp;...</td>
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<td><strong>Parts For Machinery</strong></td>
<td>Centrifuges; Filter Etc ... Air Or Vac ...</td>
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<tr>
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<tr>
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<tr>
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<td>Automatic Regulating Or ...</td>
</tr>
<tr>
<td><strong>Tubes, Pipes &amp;</strong></td>
<td>Expts Of Repaired ...</td>
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<tr>
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<tr>
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<td>Artificial And Prepared ...</td>
</tr>
<tr>
<td><strong>Reaction Initiators &amp;</strong></td>
<td>Medicaments Nesoi, Mixed ...</td>
</tr>
</tbody>
</table>
# Oklahoma’s Top Imports (2018; 4-digit)

**Turbojets, Turbopropellers & ...**
- Machinery Etc For...
- Insulated Wire, Cable...
- Transmission Shafts, Bearings, ...

**Automatic Data Process ...**
- Taps, Cocks, Valves...
- Prepared Unrecorded Media...

**Pumps For Liquids; ...**
- Parts Of Electric...
- Printed Matter
- Parts & Access...

**Crude Oil From ...**
- Tableware & Other...
- Parts Of Balloons...
- Furniture Nesi
- Festive, Carnival Or ...

**Nuclie Acids &**
- Artificial Flowers, Foliage...
- Articles Of Or Coin
- Made-up Articles Of...
- Bras, Girdles, Garters

**Parts Of Electric ...**
- Machinery For...
- Electric Ignition Etc...
- Boards, Panels Etc...

**Tractors (other Than ...**
- Parts & Access...
- Tractors Etc...
- Parts Of Balo

**Wood Marquetry Etc...**
- Printed Matter
- Articles Of Nesi
- Articles Of Nesi &

**Parts Of ...**
- Electric Apparatus For...
- Electric Trans, Static...
- Parts Etc For...

**Nessi ...**
- Parts For Machinery...
- Parts For Machinery...
- Machines Etc Having...

**Natural Rubber, Balle...**
- Natural Rubber, Balle...
- Polymers Of Ethylene,

**Parts Etc For ...**
- Machinery For Working...
- Machinery For Working...
- Machines Etc, Sound...

**Toilet Paper, Towels...**
- Toilet Paper, Towels...
- Chemical Woodpulp, Sota
- Wooden Frames, Paintings, ...

**Articles Of Or ...**
- Articles Of Or Coin
- Made-up Articles Of...
- Bras, Girdles, Garters

**Toilet Paper, Towels...**
- Toile Paper, Towels...
- Chemical Woodpulp, Sota
- Wooden Frames, Paintings, ...

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Oklahoma’s Top Imports (2018; 4-digit)

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<th>Automatic Data Process ...</th>
<th>Machinery Etc For ...</th>
<th>Elect Trans, Static ...</th>
<th>Parts For Machinery ...</th>
<th>Machinery For ...</th>
<th>Machinery For Working ...</th>
</tr>
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<tbody>
<tr>
<td>Pumps For Liquids; ...</td>
<td>Insulated Wire, Cable ...</td>
<td>Electric Apparatus For ...</td>
<td>Machines Etc Having ...</td>
<td>Machines Etc ...</td>
<td>Microphones, Loudspeakers, Sound ...</td>
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<tr>
<td></td>
<td>Transmission Shafts, Bearings, ...</td>
<td>Electric Ignition Etc ...</td>
<td>Tv Recvs, Incl ...</td>
<td>Equipment ...</td>
<td>Centrifuges, Filter Etc ...</td>
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<td>Boards, Panels Etc ...</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Tableware &amp; Other ...</th>
<th>Articles Of Plastics ...</th>
<th>Natural Rubber, Balloons ...</th>
<th>Articles Nesoi Of ...</th>
<th>Nucleic Acids &amp; ...</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wooden Frames, Paintings ...</td>
<td>Polypropylene, Polyethylene ...</td>
<td>Paper, Uncoated, For ...</td>
<td>Coin ...</td>
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<td></td>
<td>Chemical Wood pulp, Seats ...</td>
<td>Wood and Wood Marquetry Etc ...</td>
<td>Wood, Wood Marquetry ...</td>
<td>Articles Of Oil ...</td>
</tr>
<tr>
<td></td>
<td>Printed Matter, Nesoi, ...</td>
<td>Women's Or Girls' ...</td>
<td>Men's Or Boys' ...</td>
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<td>Tractors, Pipes ...</td>
<td>Furniture Nesoi And ...</td>
<td>Articles Of Iron ...</td>
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<td>Tubes, Pipes &amp; ...</td>
<td>Direction Finding Compasses ...</td>
<td>Survey, Hydrogr, Meteor ...</td>
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<td>Toys Nesoi: Skates ...</td>
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<td></td>
<td>Lamps &amp; Lighting ...</td>
<td>Expats Charity Nesoi: ...</td>
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<td></td>
<td></td>
<td>Expts Of Repaired ...</td>
<td>Seats (except Barber, ...</td>
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</table>
Crude Oil Imports

- Oklahoma produces 575,000 bpd (USEIA)
- Crude oil is consistently Oklahoma's largest import product
  - 26% of Oklahoma imports of goods & services (USCB)
  - $3.095 bn in 2018
  - Source: Canada
    - Until 2010: Saudi Arabia, Venezuela, Iraq, Russia, Nigeria, Brazil
- Context: rising US oil production
  - 7.78 mbpd in 2008 to 14.61 mbpd in 2018
  - 2016 crude oil export ban lifted
    - Export markets: Canada, South Korea, Netherlands, India, UK, Taiwan, China

2709
Crude Slate

Mix of different crude grades that a refinery is designed to use

- Light
- Sweet
- Heavy
- Sour

US Crude oil *production*

US refinery *consumption*
US reliance on petroleum imports has declined
- From 56.9% in 2008 to only 24.8% in 2018

- No crude oil exports registered from Oklahoma
Oklahoma Refineries

<table>
<thead>
<tr>
<th>Refinery Name</th>
<th>Capacity (bpd)</th>
<th>Company</th>
<th>Location</th>
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<tbody>
<tr>
<td>Ardmore Refinery (1913)</td>
<td>86,000</td>
<td>Valero Energy Corp.</td>
<td>San Antonio, TX</td>
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<tr>
<td>Ponca City Refinery (1920s)</td>
<td>200,000</td>
<td>Philips 66 Co.</td>
<td>Houston, TX</td>
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<tr>
<td>Tulsa Refinery East &amp; West (1910 &amp; 1913)</td>
<td>155,300</td>
<td>HollyFrontier Corp.</td>
<td>Dallas, TX</td>
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<tr>
<td>Wynnewood Refinery (1923)</td>
<td>70,000</td>
<td>CVR Energy</td>
<td>Sugar Land, TX</td>
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<tr>
<td>Thomas Oil Refinery (1982)</td>
<td>14,000</td>
<td>Ventura Refining &amp; Transmission</td>
<td>Oklahoma City, OK</td>
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- Are local actors capturing value?
- Petrochemical sector DOES offer opportunities to Oklahoman firms
Imports are necessary for the US refining/oil industry

Refineries are critical
• Determine future oil flows

Implications for Oklahoma authorities
• Market for oil exports
• Oil imports afford Oklahoma actors a role (Cushing)
• Trade deficit with Canada ($1.57 bn exports vs $4.96 bn imports in 2019)
• Sector policy / Oklahoman firms capturing value / supply chain

*Network analysis
# Oklahoma’s Top Exports (2018; 4-digit)

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- **Bombs, Grenades Etc;...**
- **Direction Finding Compasses...**
- **Peptones, Other Proteins...**
- **Artificial And Prepared...**
- **Medicaments Nesoi, Mixed...**
Taps, Cocks, Valves, and Similar Appliances for pipes, boiler shells, tanks, vats or the like

8481

- Top OK import & export
- What is the trade flow?
- Market inefficiencies?
- Oil Industry

Source: US Census Bureau, Raw Data
Other Purposes

Oil Industry

• Kansas exports of commodity increased
• Indication of use in other industries
• Opportunity to expand?

Source: US Census Bureau, Raw Data
Market Share

848180 Marketshare Wins and Losses

- All 50 states, DC and territories
- Pie is getting bigger
- TX and OK losing market-share
- Opportunity

Source: US Census Bureau, Raw Data
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Commodity analysis – Cotton Export

Countries where OK exports cotton and imports apparel

Cotton exporter countries

- Brazil
- Benin
- Burkina Faso
- Turkey
- Pakistan
- India
- China
- Bangladesh
- Vietnam
- Malaysia
- South Korea
- Australia
Cotton supply chain

Sustainable Cotton

Our goal is to use 100% sustainable cotton by 2020. That means using certified organic, recycled and Better Cotton Initiative (BCI) licensed cotton. These materials use less water and fewer chemicals, improve farming practices and provide the same or better quality than conventionally grown cotton.
How to move forward?

2% of total exports from Oklahoma in 2019

<table>
<thead>
<tr>
<th>STATE</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>OK</td>
<td>37</td>
<td>52</td>
<td>113</td>
<td>165</td>
<td>109</td>
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<tr>
<td>MS</td>
<td>296</td>
<td>280</td>
<td>471</td>
<td>634</td>
<td>765</td>
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<tr>
<td>TN</td>
<td>693</td>
<td>640</td>
<td>692</td>
<td>764</td>
<td>685</td>
</tr>
<tr>
<td>CA</td>
<td>548</td>
<td>575</td>
<td>578</td>
<td>565</td>
<td>556</td>
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<td>GA</td>
<td>575</td>
<td>328</td>
<td>438</td>
<td>494</td>
<td>527</td>
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In million USD

Source: United States Census Bureau
Future Research: Network Analysis and Market Shocks

- Market shocks
  - Swine flu
  - Coronavirus
  - Trade Wars

- Network analysis supports prediction:
  - Exogenous covariates: e.g. GDP and Distance
  - Structural Dependence: e.g. Reciprocity and Clustering
  - Simulation based prediction
Conclusion

**Insights**
- Complex
- Network
- Supply chains critical

**Potential Future Research**
- Deeper comparative study / scorecard of Oklahoma vs. surrounding or similar states
- Value-chain and/or capabilities-based study to identify potential new industry clusters
- Analysis of service export opportunities
Q&A / Input

- What did you see that you’d like to see more or deeper analysis of?
- Looking ahead, what would be most valuable to the GIT?
- What would be helpful to promote Oklahoma trade?