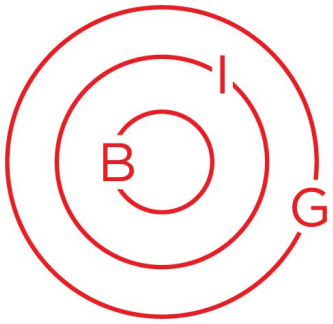
BORDERS IN GLOBALIZATION



Borders in Globalization Research Project 15

Alberta's Oil Sands Manufacturing Supply Chain Imports: Evaluating Borders, Boundaries and Borderlands

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Introduction

• The purpose of the Borders in Globalization (BIG) study is to "challenge the concepts that borders are primarily understood as territorial boundaries that emerge out of international treaties."

• Specifically, the project questions whether this conception of borders "adequately captures current forms of bordering processes, including territorial boundaries." It also challenges traditional Western concepts of sovereignty, territorial integrity and self-determination.

• To answer these questions the BIG project focuses on two main research areas:

• (a) Regional Studies – this assumes there are numerous challenges to traditional concepts of territorial boundaries (such as culture, history, and "flows") that "straddle the boundary, the borderland, and the border region."

• (b) Thematic Studies – that work under the assumption that "bordering processes are not uniquely territorial anymore but fundamentally linked to interactions across the world."

• As such, "networks and flows" have a history and culture and are "fluid in nature like trade, migrations, and environmental changes, and security, and ultimately have led to new forms of governance."

• These bordering processes accept that spaces are not territorial "but can be cultural, legal, or regulatory" and that any emerging governance structures are not driven by "states and governments, within their own sovereign territories."[1]

Thesis of this Study

• This study will evaluate these broader research questions in the context of manufacturing supply chains in Alberta's oil sands. There is no questioning the economic importance of the oil and gas industry in Alberta. What is often overlooked, however, is the importance of manufacturing in this sector related to project supply chains. At this point, the Canadian Manufacturers and Exporters (CME) is the only group to complete a comprehensive study of this issue. The report was based on two CME commissioned Statistic Canada simulations using an input-output model, one focusing on capital investment on manufacturing and

[1] Borders in Globalization, *Project Update 2013-2015* (Victoria: Centre for Global Studies, 2015), pp. 8-9.

the other on the impact of ongoing maintenance, repair and operations (MRO) spending.[2]

• In Canada's domestic economy the CME noted, not surprisingly, that Alberta was the main beneficiary of this activity, although all ten provinces witnessed an increase in manufacturing spending that could be attributed in some way to expenditures in the oil sands. In 2010, the most current year for data the CME was able to secure, manufacturing sales totaled $2 billion outside of Alberta with Ontario responsible for 41 per cent of that total.[3] Saskatchewan was second with 24.3 per cent and Quebec at 13.7 per cent. Given these statistics it is clear that domestic trade in this supply-chain is not exclusively regional or borderland.

• The CME report, however, also pointed out that over 50 per cent of sales in Alberta's manufacturing supply-chain came from international sources. This study will examine these foreign imports in the context of the BIG border/region thesis.

Methodology

• What is input-output modeling? According to the CME input-output models attempt to evaluate the impact of one sector on the economy as a whole. They implement existing knowledge of "inter-industry" relationships to monitor changes in outputs. In order to do this the model will "shock" the status quo by introducing an increase or decrease in outputs and then analyze the impact of these developments in other sectors.

• Problems with this approach, however, are its linear assumptions, where a $100 shock will have a $200 shock elsewhere in the economy, and so forth exponentially. As the CME makes clear, this does not always translate into reality as economies of scale and technology often distort symmetrical growth. The static nature of the model is also problematic, as it does not account for periods of time for changes to be fully realized in the real economy (see below).[4]

• How is oil sands manufacturing identified? The key to evaluating inter-industry relationships is to isolate the manufactured products that move within a supply-chain. The CME specified 25 supply-chain opportunities for Canadian

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[2] Canadian Manufacturers and Exporters, *Manufacturing Supply Chains in Alberta's Oil Sands (October 2014)*, <http://www.cme-mec.ca/_uploads/_media/50iyksdi2.pdf> (15 January 2016), pp. 1-2.

[3] Note that these figures do not include goods within this supply-chain coming from within the Alberta economy.

[4] Canadian Manufacturers and Exporters, *Manufacturing Supply Chains in Alberta's Oil Sands*, p. 10.

manufacturers in the Alberta oil sands in descending order of importance, including:[5]

1. Logging, mining and construction machinery and equipment
2. Iron and steel pipes and tubes
3. Iron and steel basic shapes
4. Measuring, medical and controlling devices
5. Diesel fuel
6. Metal valves and pipe fittings
7. Engine and power transmission equipment
8. Gasoline
9. Pumps and compressors
10. Boilers, tanks, and heavy metal containers
11. Medium and heavy-duty trucks and chassis
12. Rolled steel products including wire
13. Fabricated structural metal
14. Concrete products
15. Forged and stamped metal products
16. Lubricants
17. Other chemical products
18. Material handling equipment
19. Basic inorganic chemicals
20. Basic organic chemicals
21. General purpose machinery
22. Architectural metal products
23. Plastic building and construction materials
24. Agricultural gardening machinery and equipment
25. Heavy fuel oils

• In over half of these twenty-five categories, however, more than 50 per cent of goods and equipment originated from outside of Canada. Nine of these reached levels of 70 per cent or more, including:

1. Logging, mining and construction machinery and equipment
2. Measuring, medical and controlling devices
3. Metal valves and pipe fittings
4. Pumps and compressors
5. Medium and heavy-duty trucks and chassis
6. Rolled steel products including wire
7. Material handling equipment
8. General purpose machinery
9. Agricultural gardening machinery and equipment

[5] Ibid., p. 49.

• This study will analyze international imports to Alberta's oil sands manufacturing supply-chain, using relevant four digit product codes as compiled by Industry Canada during a period ranging from 1990-2014, in order to evaluate the border/region thesis of the larger BIG project.[6] As per the CME report the following supply-chain groups were tracked:

Category 1, 8 and 9 - Logging, Mining, Construction Machinery & Equipment
3402 – Surface Agents or Preparations
3811 – Lubricating Oil and Other Prepared Additives
3815 – Supported Catalysts and Preparations
3820 – Anti-Freezing Preparations
3824 – Foundry, Chemical Products and Preparations
4407 – Lumber
8207 – Interchangeable Tools, Anvils, Forges, etc.
8405 – Gas and Acetylene Generators
8419 – Non-Domestic Dryers and Water Heaters
8427 – Self-Propelled Work Trucks
8429 – Self-Propelled Bulldozers, Scrapers, Graders, etc.
8474 – Machinery for Handling Stones
8479 – Machines Having Mechanical Functions
8504 – Electrical Transformers and Inductors
9015 – Surveying or Geophysical Instruments

Category 2 and 4 - Measuring Devices, Pumps & Compressors
8413 – Pumps for Liquids and Liquid Elevators
8414 – Air/Vacuum Pumps, Compressors and Fans
8421 – Centrifuges and Filtering Machinery for Liquids and Gasses
8502 – Electric Generating Sets and Converters
9026 – Instruments for Measuring or Checking Variables of Liquids or Gasses

Category 3 - Metal Valves & Pipe Fittings
7307 – Tube or Pipe Fittings of Iron or Steel
8311 – Rods, Tubes, Plates and Other Soldering/Brazing/Welding Articles
8481 – Taps, Valves and Similar Fittings for Pipes, Boilers, Tanks, etc.

Category 5 - Heavy Duty Trucks, Engine & Transmission
8408 – Diesel or Semi-Diesel Engines
8409 – Parts for Engines

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[6] Industry Canada, *Trade Data Online: Trade by Product (HS) – HS Codes*, <http://strategis.gc.ca/sc_mrkti/tdst/tdo/tdo.php?lang=30&headFootDir=/sc_mrkti/tdst/headfoot&productType=HS6&cacheTime=962115865#tag> (10 January 2016).

8483 – Transmission Shafts
8501 – Electric Motors and Generators
8503 – Parts for Electric Motors and Generators
8704 – Trucks or Other Vehicles for the Transport of Goods
8705 – Motor Vehicles for Special Non-Transport Purposes

Category 6 - Iron/Steel Pipes & Tubes
7304 – Tubes, Pipes and Hollow Profiles of Iron or Steel
7305 - Other Tubes, Pipes with External Diameter >406 mm of Iron or Steel
7306 – Other Tubes, Pipes and Hollow Profiles of Iron or Steel

Category 6 - Iron/Steel Products, Wire
7214 – Other Bars and Rods of Iron/Non-Alloy Steel
7326 – Other Articles of Iron or Steel
8431 – Parts suitable for Machinery of Headings

- As a point of comparison imports of petroleum oils and gasses were also included:

Other Energy Exports (Petroleum Oils & Gasses)
2709 – Crude Petroleum Oils
2710 – Preparations of Non-Crude Petroleum Oils
2711 – Liquefied Petroleum or Hydrocarbon Gasses

- There are, however, limitations with these statistics. The first is data reliability. Provincial trade statistics are compiled by Industry Canada but these figures are a combination of data collected by Statistics Canada and the United States Census Bureau (US Department of Commerce). This is not an issue when examining aggregate trade but when data is broken down to four digit product codes there are inconsistencies in both the "collection" and "categorization" of this information.

- Another danger of engaging in comparative statistical analysis on a yearly basis is that trade relations are not limited to twelve month cycles. Statistical anomalies are also not always a clear deviation in trade. The reality is that trade is influenced by exchange rates, inflation, and investment and production cycles, which are all unaccountable in this form of raw data. One possible solution is to review data in sets of three to five year averages, which would lessen the impact of these factors. In this case a range of data spanning twenty-four years was provided to compensate for these fluctuations.

- Oil and natural gas pipelines can also distort provincial trade statistics, as can trade contracts in various sectors. Another major weakness is the lack of data on

provincial trade in services, which is an important aspect of supply-chains in the Alberta oil sands, especially in areas such as labour mobility.

Assessing Alberta's Oil Sands International Manufacturing Supply Chains (1990-2014)

- As Table One makes clear, the United States has ranked as the number one exporter to Alberta dating back to 1990. Having said that, these statistics also point to other important developments. First, bilateral trade has declined from a high of 80.1 per cent in 1990 to levels between 65 and 70 per cent in since 2010. During this time, China became Alberta's second ranked source of imports reaching a figure of almost 10 per cent, replacing previous top ranked importers (Mexico and Japan) at approximately three per cent.

- China's breakthrough, however, did not occur as a result of manufacturing supply-chains in Alberta's oils sands. As Table Two suggests, in 2010 and 2014 China sold approximately 20 per cent of its total exports to Alberta in this sector. When broken down as a percentage of total international imports to Alberta, however, Chinese imports in this supply-chain only totaled approximately two per cent in 2010 and 2014 and only 0.1 per cent in 2000.

- When American imports are broken down on a sub-federal basis three US states (Texas, Illinois, and Oklahoma) have dominated trade with Alberta, albeit at varying levels since 1990. At no point have border or regional states entered the top five, with the exception of North Dakota, at 2.1 per cent in 2014. Prior to that North Dakota ranked no higher that 32nd in 2010 at 0.5 per cent. Montana peaked at seventh in 2000 with 1.9 per cent of imports but was no higher than 15th dating back to 1990. Idaho broke into the top ten in 2014, finishing ninth at 1.3 per cent, up from 20th at one per cent in 2010.

- The lack of a regional and/or borderlands characteristics are further evident when these numbers are broken down on the basis of Alberta's manufacturing supply chains for the oil sands. In 1990, the top five importers in this sector were Illinois, Texas, California, and Pennsylvania. Illinois, for example sold almost 50 per cent of all state imports to Alberta in this supply-chain. Oklahoma, ranked second, totaled almost 70 per cent, while Texas, the top ranked importer in 1990 reached levels of 45 per cent. Approximately eight per cent of all US exports to Alberta originated in Texas in 1990.

• There were limited changes to Alberta imports in this supply-chain over the next decade. In 2000 Texas remained the number one state importer to Alberta with a slightly higher level of total US exports (9.4 per cent) than in 1990. Over 40 per cent of Texas exports to Alberta were related to the oil sands manufacturing supply-chain. Oklahoma, ranked second in overall US imports to Alberta, at 2.6 per cent with a staggering 70.4 per cent of all state exports to the province in this supply-chain. The third ranked state trading partner, Illinois came in at 2.3 per cent and 42.2 per cent respectively.

• By 2010, Illinois replaced Texas as the number one importer to Alberta, reaching a level of 8.7 per cent of all US exports to the province. Texas, now second was at 7.9 per cent and Oklahoma slipped to 2.3 per cent. What is important, however, is that this was the first year that included "other energy exports" including petroleum oils and gasses. Although Texas and Illinois exported similar amounts it comprised a much higher percentage of Alberta's imports from Illinois. In fact, approximately 86 per cent of Illinois imports related to this supply-chain consisted of these product codes.

• Why did this change in imports occur? This statistical deviation highlights the difficulty in tracking products that cross several domestic and national borders. In fact, the majority of Canadian natural gas exported to Illinois and Michigan through the TransCanada and Great Lakes Gas Transmission Company pipelines, is from Alberta companies, such as Nexen, Enbridge, and Alta Gas. A large portion of this gas, however, approximately 85 per cent, is then delivered back to Canada for markets in southern Ontario and eastern Canada.[7] Due to tracking inconsistencies some of this gas is listed as a Michigan or Illinois export to Ontario, and other quantities are recorded as an import to Alberta.

• As a result, Texas continued to dominate traditionally recorded exports into the Alberta supply-chain, comprising over 42 per cent of the state's exports into the province. Oklahoma, still third, shipped 74 per cent of its exports into this supply-chain.

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[7] United States Government, *About US Natural Gas Pipelines: Transporting Natural Gas*, <www.eia.doe.gov/pub/oil_gas/natural_gas/analysis_publications/ngpipeline/midwest.html> (23 September 2008).

- The 2014 statistics are also distorted due to the inclusion of product codes related to other energy exports. In fact, the only reason North Dakota slips into the top five is due to the same statistical significance of imports to Alberta in this product area. Once again it is Texas that dominated traditional imports into this supply-chain, although for the first time Oklahoma is no longer ranked in the top six.

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Conclusion

- Statistical evidence suggests that American imports into Alberta's oil sands manufacturing supply-chain are market driven and based on economic need and expertise in manufacturing specific goods, as opposed to any regional or borderlands pressures.

Appendices

2014	2010	2000	1990
United States 68.2%	United States 65.7%	United States 74.1%	United States 80.1%
China 9.5%	China 9.7%	Mexico 3.3%	Japan 3.1%
Mexico 4.9%	Mexico 5.0%	United Kingdom 2.2%	United Kingdom 2.3%
Germany 2.3%	Germany 2.2%	Japan 1.6%	Germany 2.2%
United Kingdom 1.4%	United Kingdom 1.8%	Germany 1.6%	Italy 1.2%

Table One - Top Five International Exporters to Alberta (Percentage of Total Alberta Global Imports)

Source: Industry Canada, *Trade Data Online: Trade by Product (HS) – HS Codes.*

	2014	2010	2000
Logging, Mining, Construction Machinery & Equipment[8]	N/A	18,382	N/A
Iron/Steel Pipes & Tubes	197,271	189,050	N/A
Iron/Steel Products, Wire	133,900	39,290	N/A
Measuring Devices, Pumps & Compressors	120,484	39,483	3326
Metal Valves & Pipe Fittings	199,132	64,532	8827
Heavy Duty Trucks, Engine & Transmission	N/A	N/A	N/A
Other Energy Exports (Petroleum Oils & Gasses)	N/A	N/A	N/A
Total Sectoral Exports (Thousands of Cdn $'s)	652,787	350,737	12,153
% of Total Chinese Exports to Alberta	21.1%	18.6%	7.4%
% of Total International Imports to Alberta	2.0%	1.8%	0.1%

Table Two - China Exports to Alberta Oil Sands Manufacturing Supply Chain

Source: Industry Canada, *Trade Data Online: Trade by Product (HS) – HS Codes*

[8] Top Sectors for the Alberta Oil Sands and Energy Sector defined by Canadian Manufacturers and Exporters, *Manufacturing Supply Chains in Alberta's Oil Sands*, http://www.cme-mec.ca/_uploads/_media/50iyksdi2.pdf, p. 49

Table Three - Top Five U.S. State Exporters to Alberta

2014	2010	2000	1990
Illinois 18.2%	Texas 12.3%	Texas 16.4%	Texas 12.6%
Texas 10.9%	Illinois 7.3%	California 13.6%	California 10.5%
California 5.1%	California 6.4%	Illinois 4.0%	Illinois 5.3%
Washington 2.6%	Washington 2.5%	Oklahoma 2.8%	Oklahoma 3.2%
North Dakota 2.1%	Ohio 2%	Ohio 2.5%	Ohio 2.4%

(Percentage of Total Alberta Global Imports)

Source: Industry Canada, *Trade Data Online: Trade by Product (HS) – HS Codes.*

North Dakota
1990 – Ranked 35th – 0.1%
2000 – Ranked 43rd – 0.1%
2010 – Ranked 32nd – 0.5%
2014 – Ranked 5th – 2.1%

Montana
1990 – Ranked 21st – 0.9%
2000 – Ranked 7th – 1.9%
2010 – Ranked 15th – 1.1%
2014 – Ranked 22nd – 0.8%

Idaho
1990 – Ranked 30th – 0.6%
2000 – Raked 14th – 1.1%
2010 – Ranked 20th – 1.0%
2014 – Ranked 9th – 1.3%

	Illinois[9]	Texas	California	Oklahoma	Penn	Ohio
Logging, Mining, Construction Machinery & Equipment[10]	64,723	122,606	4185	31,167	7789	4055
Iron/Steel Pipes & Tubes	N/A	10,955	N/A	9458	N/A	N/A
Iron/Steel Products, Wire	16,542	26,108	N/A	3785	1684	2670
Measuring Devices, Pumps & Compressors	7814	30,150	22,681	23,904	5074	7370
Metal Valves & Pipe Fittings	2428	42,077	10,065	15,216	3526	N/A
Heavy Duty Trucks, Engine & Transmission	19,481	5033	N/A	6697	1086	2777
Other Energy Exports (Petroleum Oils & Gasses)	N/A	N/A	N/A	2726	N/A	N/A
Total Sectoral Exports (Thousands of Cdn $'s)	110,988	236,929	36,931	92,953	19,159	16,872
% of Total State Exports to Alberta	49.3%	45%	8.3%	68.6%	20.8%	16.7%
% of Total U.S. Imports to Alberta	3.8%	8.1%	1.2%	3.2%	0.6%	0.5%

[9] Totals for each state as listed in Top 25 Product Groups (HS4 Codes), Industry Canada, *Trade Data Online: Trade by Product (HS) – HS Codes*.

[10] Top Sectors for the Alberta Oil Sands and Energy Sector defined by Canadian Manufacturers and Exporters, *Manufacturing Supply Chains in Alberta's Oil Sands*, http://www.cme-mec.ca/_uploads/_media/50iyksdi2.pdf, p. 49.

Table Four - Top US Manufacturing Supply Chain Exporters to Alberta Oil Sands – 1990

	Illinois[11]	Texas	California	Oklahoma	New York	Ohio

Table Five - Top Manufacturing Supply Chain Exporters to Alberta Oil Sands - 2000

[11] Totals for each state as listed in Top 25 Product Groups (HS4 Codes), Industry Canada, *Trade Data Online: Trade by Product (HS) – HS Codes.*

Logging, Mining, Construction	66,621	329,375	23,773	97,507	7972	2615
Machinery & Equipment[12]	Illinois[13]	Texas	California	Washington	Oklahoma	Ohio
Iron/Steel Pipes & Tubes	N/A	62,303	N/A	4821	N/A	N/A
Iron/Steel Products, Wire	31,508	51,203	N/A	6711	N/A	2535
Measuring Devices, Pumps & Compressors	12,296	132,129	14,673	66,303	16,037	19,394
Metal Valves & Pipe Fittings	4548	108,475	15,622	58,532	1661	22,190
Heavy Duty Trucks, Engine & Transmission	93,781	20,463	N/A	7898	N/A	2705
Other Energy Exports (Petroleum Oils & Gasses)	N/A	142,052	N/A	N/A	N/A	N/A
Total Sectoral Exports (Thousands of Cdn $'s)	208,754	846,000	54,068	241,772	25,670	49,439
% of Total State Exports to Alberta	42.2%	42.5%	3.2%	70.4%	9.1%	15.7%
% of Total U.S. Imports to Alberta	2.3%	9.4%	0.6%	2.6%	0.2%	0.5%

[12] Top Sectors for the Alberta Oil Sands and Energy Sector defined by Canadian Manufacturers and Exporters, *Manufacturing Supply Chains in Alberta's Oil Sands*, http://www.cme-mec.ca/_uploads/_media/50iyksdi2.pdf, p. 49.

[13] Totals for each state as listed in Top 25 Product Groups (HS4 Codes), Industry Canada, *Trade Data Online: Trade by Product (HS) – HS Codes.*

Logging, Mining, Construction Machinery & Equipment[14]	96,204	243,576	58,255	5081	97879	34,550
Iron/Steel Pipes & Tubes	N/A	83,477	N/A	N/A	18,118	9864
Iron/Steel Products, Wire	15,588	133,295	14,951	1141	25766	N/A
Measuring Devices, Pumps & Compressors	8039	174,580	56,724	N/A	73,188	9206
Metal Valves & Pipe Fittings	3868	174,327	18,513	1362	59,566	39808
Heavy Duty Trucks, Engine & Transmission	24,730	40,092	N/A	7,376	21,915	19,807
Other Energy Exports (Petroleum Oils & Gasses)	951,703	156,726	10,429	N/A	N/A	N/A
Total Sectoral Exports (Thousands of Cdn $'s)	1,100,132	1,006,073	158,872	14960	296,432	113,235
% of Total State Exports to Alberta	77.9%	42.2%	12.7%	3.0%	74%	28.1%
% of Total U.S. Imports to Alberta	8.7%	7.9%	1.2%	.01%	2.3%	.08%

Table Six - Top Manufacturing Supply Chain Exporters to Alberta Oil Sands - 2010

[14] Top Sectors for the Alberta Oil Sands and Energy Sector defined by Canadian Manufacturers and Exporters, *Manufacturing Supply Chains in Alberta's Oil Sands*, http://www.cme-mec.ca/_uploads/_media/50iyksdi2.pdf, p. 49.

	Illinois[15]	Texas	California	Washington	N. Dakota	Ohio
Logging, Mining, Construction Machinery & Equipment[16]	165,855	419,718	47,684	29,293	5294	17,244
Iron/Steel Pipes & Tubes	11,523	122,308	N/A	N/A	N/A	18,329
Iron/Steel Products, Wire	10,605	48,429	25,148	4992	888	N/A
Measuring Devices, Pumps & Compressors	7611	217,835	52,823	N/A	928	40,247
Metal Valves & Pipe Fittings	10,861	201,976	22,150	2370	405	63,830
Heavy Duty Trucks, Engine & Transmission	29,444	123,518	N/A	1931	21,915	5472
Other Energy Exports (Petroleum Oils & Gasses)	4,961,982	48,864	20,984	4675	514,418	145,621
Total Sectoral Exports (Thousands of Cdn $'s)	5,197,881	2,188,721	168,789	43,261	543,848	270,753
% of Total State Exports to Alberta	88.4%	62.1%	10.1%	5.0%	77.7%	43.2%
% of Total U.S. Imports to Alberta	23.5%	9.9%	0.7%	.01%	2.4%	1.2%

[15] Totals for each state as listed in Top 25 Product Groups (HS4 Codes), Industry Canada, *Trade Data Online: Trade by Product (HS) – HS Codes.*

[16] Top Sectors for the Alberta Oil Sands and Energy Sector defined by Canadian Manufacturers and Exporters, *Manufacturing Supply Chains in Alberta's Oil Sands*, http://www.cme-mec.ca/_uploads/_media/50iyksdi2.pdf, p. 49.

Table Seven - Top Manufacturing Supply Chain Importers for Alberta Oil Sands - 2014