Disruptive Trade Policy: Impacts on the Iowa Economy

Edward J. Balistreri

Iowa State University

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Full list of contributors

The Impact of the 2018 Trade Disruptions on the Iowa Economy

Edward J. Balistreri, Associate Professor, Department of Economics, Iowa State University

Chad E. Hart, Associate Professor, Department of Economics, Iowa State University

Dermot J. Hayes, Professor, Department of Economics and Department of Finance, Iowa State University

Minghao Li, Postdoctoral Research Associate, Center for Agricultural & Rural Development, Iowa State University

Lee Schulz, Associate Professor, Department of Economics, Iowa State University

David A. Swenson, Associate Scientist, Department of Economics, Iowa State University

Wendong Zhang, Assistant Professor, Department of Economics, Iowa State University

John M. Crespi*, Interim Director, Center for Agricultural & Rural Development and Professor, Department of Economics, Iowa State University

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Overview and Key Research Questions

- The U.S. has imposed high tariffs in 2018 (particularly on Chinese goods).
- China and other countries have retaliated with substantial tariffs on U.S. goods.
- The U.S. (particularly Iowa) has a global cost advantage, and therefore exports, many agricultural products (pork, soybeans, corn).
- What are the impacts on Iowa of the 2018 trade war?
  $1B to $2B
- What are the distributional implications for Iowa?
  Pork -$900M, Soybeans -$520M, Metals +$215M
- Method: Calibrated general-equilibrium simulation model of Iowa.

Some history...

- Climate Policy (1997): MRN + State-level models
- IMPLAN-based GE models
- Linked modeling system MRT-MRN-State

MRN

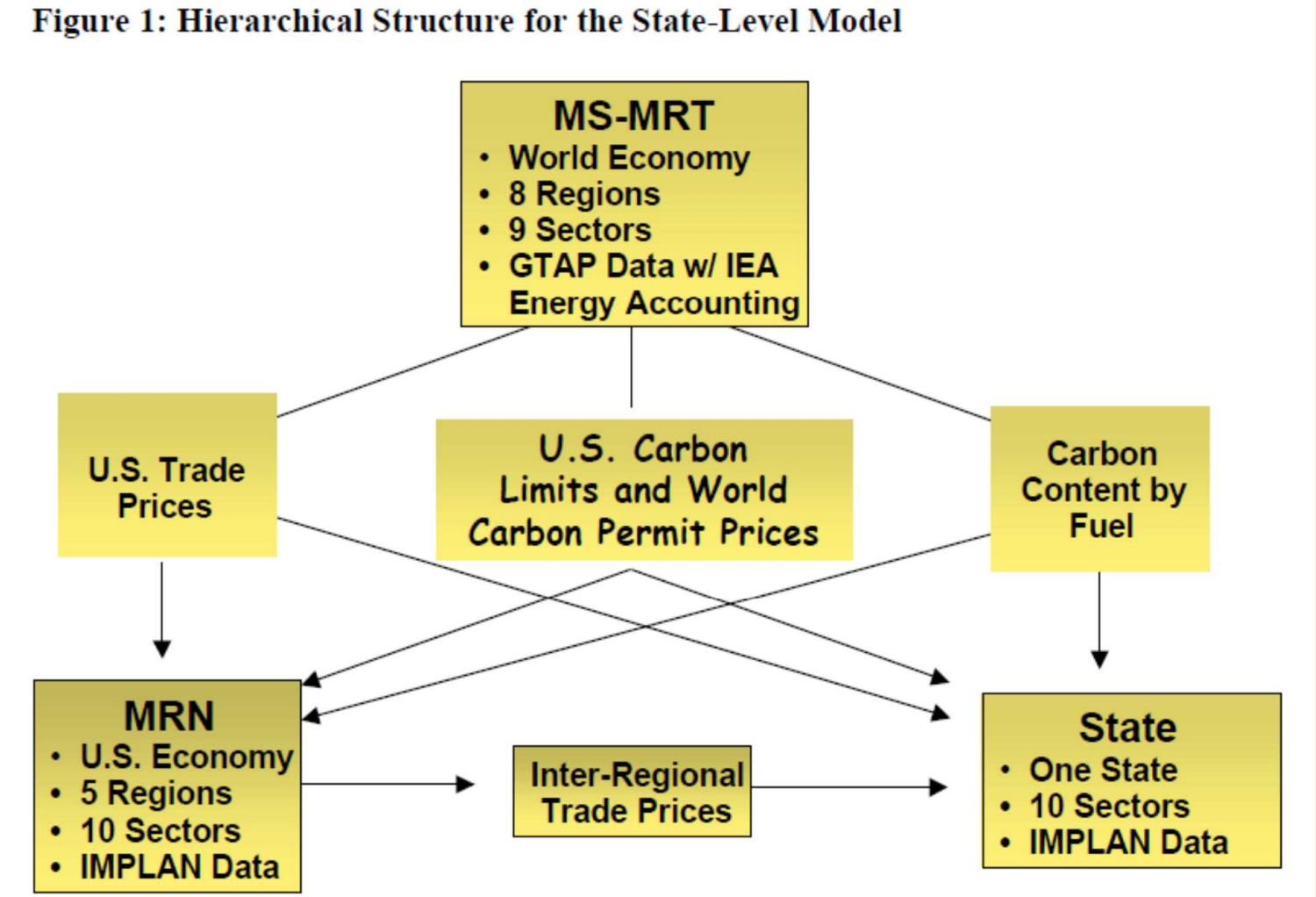
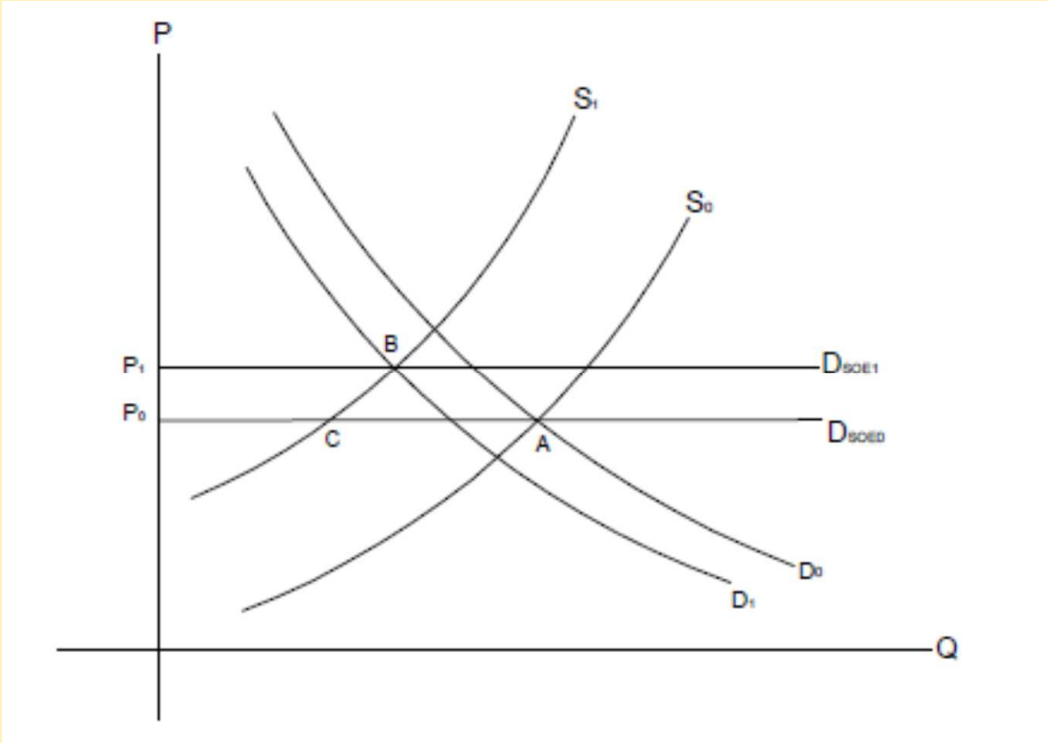


Figure 1: Hierarchical Structure for the State-Level Model
MS-MRT
• World Economy
• 8 Regions
• 9 Sectors
• GTAP Data w/ IEA Energy Accounting
U.S. Trade Prices
U.S. Carbon Limits and World Carbon Permit Prices
Carbon Content by Fuel
MRN
• U.S. Economy
• 5 Regions
• 10 Sectors
• IMPLAN Data
Inter-Regional Trade Prices
State
• One State
• 10 Sectors
• IMPLAN Data

Mansur and Whalley (1982) Decomposition



Policy Highlights

- 2017 Safeguard provisions (201): Solar panels and washing machines
- March 2018 national security provisions (232): steel and aluminum (retaliation, including VERs)
- July/Aug. 2018 (China unfair trade 301): 25% on $50B and like retaliation
- Sept. 2018 (China unfair trade 301): 10% on $200B and retaliation on $60B
- Postponed (Jan. 2019) Final-round escalation to 25% on $200B and like retaliation (not included in study results)

The Model and Data

- Iowa as a small open economy trading with the rest of the world
- WiNDC State-level data
- Twenty-sector general equilibrium, full input-output relationships with elastic price responses, and income reconciliation.
- The key policy impact of the tariffs can be translated into the prices that Iowa faces (price of steel goes up and the price of beans goes down)
- ...but by how much?
- Global model run (GTAPinGAMS model) with US as a region to generate the price impacts.
- Sensitivity: Scenario A (elastic) and Scenario B (inelastic)

Messy details

- Projection 2014 to 2017 GSP
- 2017 gross output for key sectors (soybeans, corn, pork, beef, ethanol, primary metals)
- Simplified import/export demand system (no national goods)

Table 10. Iowa Price Impacts

	Export Price (% change) (US price)		Import Price (% change) (wtd. avg of Import and US price)	
	Scenario A	Scenario B	Scenario A	Scenario B
Soybeans	-2.8	**-10.0**	-0.3	-0.8
Corn	-0.9	**-4.0**	-0.5	-0.4
Other crops	-1.1	-0.3	-0.3	0.1
Beef	-0.8	-0.6	-0.9	-0.7
Dairy	-0.8	-0.7	-0.8	-0.7
Poultry and eggs	-0.6	-0.6	-0.6	-0.6
Pork	**-7.0**	**-12.0**	-0.2	-0.2
Natural resources	-0.1	0.0	0.0	0.1
Construction	0.1	0.1	0.1	0.1
Food	-0.1	-0.3	0.0	-0.1
Petroleum	0.2	0.2	0.2	0.2
Chemicals	0.0	0.1	0.2	0.2
Plastic and rubber	0.0	0.1	0.1	0.2
Primary metals	0.7	2.4	4.3	5.5
Metal products	0.6	0.6	0.7	0.7
Electronics	0.5	0.9	1.5	1.7
Other Manufacturing	0.2	-0.1	0.1	0.0
Trade	0.0	0.0	0.0	0.0
Transport	0.0	0.1	0.1	0.1
Other Services	0.0	0.0	0.0	0.1

Table 11. Welfare impacts ($ million)

	Scenario A	Scenario B
With Tariff-revenue Transfer	-952.2	-1,909.6
No Tariff-revenue Transfer	-1,094.9	-2,052.2

Table 12. Gross State Product impacts by expenditure ($ million)

		Scenario A		Scenario B	
	Benchmark	change ($M)	change (%)	change ($M)	change (%)
Consumption	111,119	-955	-0.9	-1,900	-1.7
Investment	35,742	44	0.1	36	0.1
Government	24,800	-3	0.0	4	0.0
Net Exports (X-M)	18,529	-140	-0.8	-140	-0.8
Gross State Product	190,191	-1,054	-0.6	-2,000	-1.1

Table 13. Gross State Product impacts by sectoral value added ($ million)

	Benchmark ($M)	Scenario A change ($M)	Scenario A change (%)	Scenario B change ($M)	Scenario B change (%)
Soybeans	2,496	-144	-5.8	-520	-20.8
Corn	2,949	-77	-2.6	-337	-11.4
Other crops	4,164	-79	-1.9	-26	-0.6
Beef	995	-21	-2.1	-12	-1.2
Dairy	1,218	-27	-2.2	-20	-1.7
Poultry and eggs	801	-15	-1.8	-12	-1.6
Pork	4,623	-532	-11.5	-911	-19.7
Natural resources	1,217	-2	-0.1	1	0.1
Construction	7,998	7	0.1	17	0.2
Food	6,888	2	0.0	-38	-0.6
Petroleum	1,511	0	0.0	-4	-0.2
Chemicals	6,116	4	0.1	8	0.1
Plastic and rubber	1,119	-4	-0.4	-3	-0.3
Primary metals	1,453	18	1.2	215	14.8
Metal products	2,369	-42	-1.8	-72	-3.1
Electronics	2,581	31	1.2	72	2.8
Other Manufacturing	13,940	-103	-0.7	-348	-2.5
Trade	19,718	-40	-0.2	-79	-0.4
Transport	5,335	-2	0.0	2	0.0
Other Services	102,702	-29	0.0	68	0.1
Gross State Product	190,191	-1,054	-0.6	-2,000	-1.1

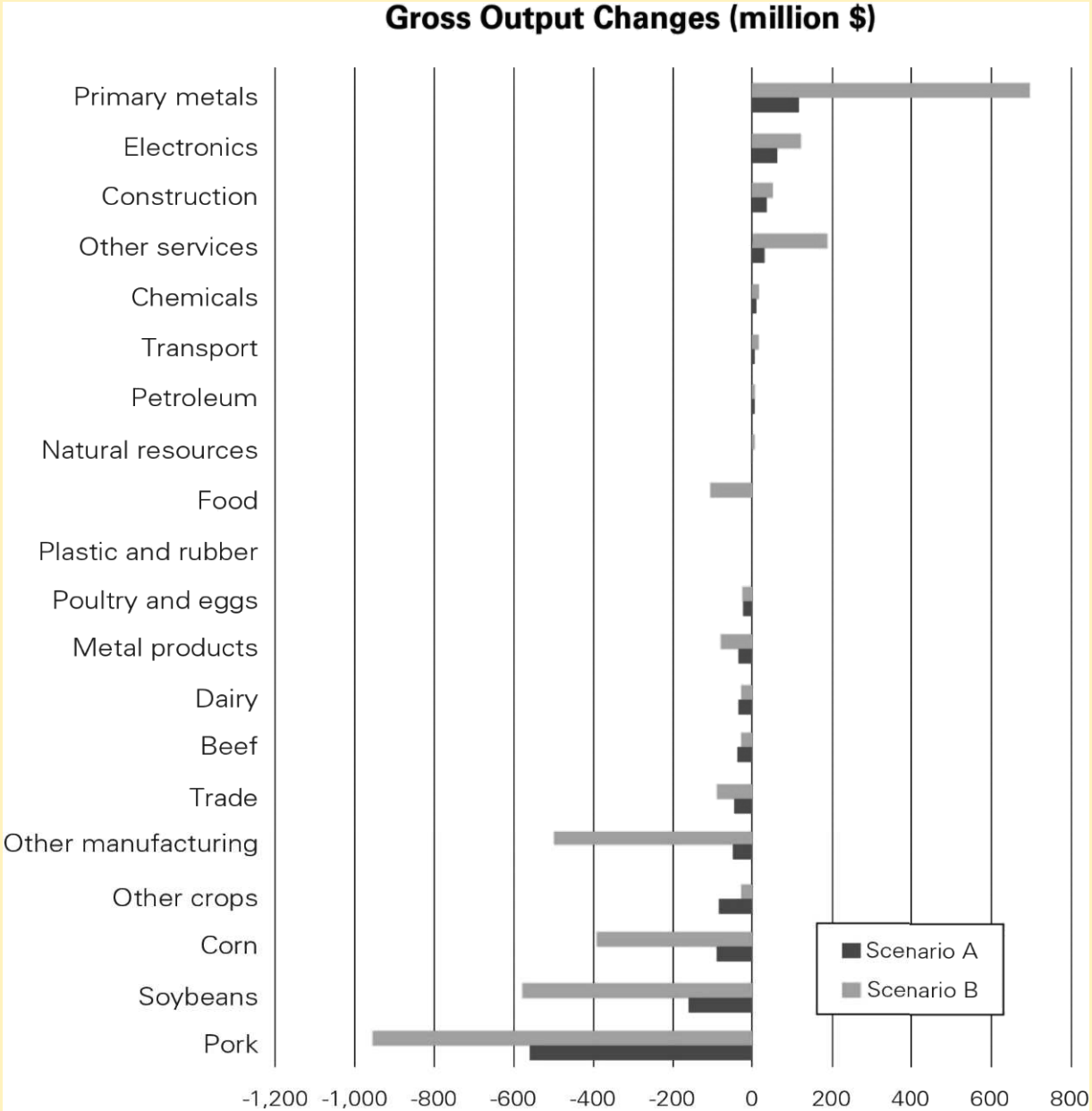


Figure 5. Gross output (revenue) impacts for Iowa industries.

Table 14. Gross Output Impacts

	Benchmark ($M)	Scenario A		Scenario B	
		change ($M)	change (%)	change ($M)	change (%)
Pork	7,119	-558	-7.83	-955	-13.42
Soybeans	5,195	-159	-3.07	-579	-11.15
Corn	8,469	-90	-1.06	-393	-4.64
Other Crops	7,610	-86	-1.13	-27	-0.36
Other Manufacturing	36,447	-48	-0.13	-501	-1.37
Trade	33,321	-42	-0.13	-88	-0.26
Beef	4,059	-40	-0.98	-27	-0.67
Dairy	3,578	-34	-0.95	-29	-0.80
Metal Products	5,603	-31	-0.56	-81	-1.45
Poultry and eggs	3,333	-23	-0.69	-23	-0.70
Plastic and rubber	3,466	-4	-0.10	0	0.00
Food	23,660	-2	-0.01	-103	-0.43
Natural resources	1,873	-2	-0.09	1	0.05
Petroleum	1,286	4	0.29	4	0.29
Transport	11,151	8	0.07	17	0.15
Chemicals	13,704	10	0.08	16	0.12
Other services	163,919	31	0.02	189	0.12
Construction	14,635	35	0.24	52	0.35
Electronics	3,962	61	1.53	124	3.12
Primary metals	5,176	119	2.30	701	13.54

Conclusion

- Iowa GSP and welfare losses are in the range of $1B to $2B
- Component Iowa value-added (income) impacts...
  - Pork: -$500M to -$900M (-20%)
  - Soybeans: -$140M to -$520M (-20%)
  - Corn: -$80M to -$340 (-11%)
  - Primary Metals: +$20 to +$215M (+15)%
  - Electronics: +$30M to +$70M (+3%)
  - Other Manufacturing: -$100M to -$350M (-2.5%)
- Longer term what are the goals of US policy?
- Will China ever be as critically integrated with the US again?