



Trade-Affected Workers in Illinois: Insights from Trade Adjustment Petitions, 1975-2020

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Introduction

Free trade has positively impacted the economy of many nations². The principle of comparative advantage (Kotler, 2019) is often used to explain global trade³; the principle relates (product) specialization to economic betterment of nations. David Ricardo⁴, the proponent of comparative advantage, deduced the principle from the premise of a static manufacturing sector; in other words, capital and labor were considered immobile⁵ (Schumacher, 2013).

Today, developments in transportation and communication render the “immobility of capital and labor” assumption of the Ricardian theory invalid (Jones, 2000)⁶. Trade agreements among nations not only allowed products to flow among countries without impediment, but also facilitated mobility of manufacturing⁷.

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² Borensztein et al (1998) provides evidence that “open” nations have larger GDPs than “closed” economies and argues for reduction of trade barriers among nations.

³ The normative prescription of the theorem is that nations should not try to make everything; even if a nation can make a wide variety of things better than others, it should specialize to better itself economically. For this theory, comparative production cost is the essential and the sufficient condition for international trade.

⁴ David Ricardo published the principle in 1817, part of his efforts to theorize international trade (see Ricardo, D. (1981). *The works and correspondence of David Ricardo (1st paperback ed.)*. Cambridge: Cambridge University Press.

⁵ The reasoning is that capital invested overseas is not under the investor’s control hence immovable from the investor’s place of origin; similarly, immobility of labor is due to the hesitation of the laborer to quit his birthplace and with all his (fixed) habits move to a new (foreign) place that has its own code of conduct (laws or habits).

⁶ For recent developments in international trade theory, see err H, Ruoff B. (2018). Insufficient Economic Convergence in the World Economy: How Do Economists Explain Why Too Many Countries Do Not Catch-up? *Agrarian South: Journal of Political Economy*, 7(1), 1-27.

⁷ Dillon (2009) posits that WTO laws provide businesses in developed nations access to inexpensive labor and favorable tax regimes as locations for manufacturing facilities.

To offset the effects of job losses due to international trade, the Trade Adjustment Assistance program (TAA) provides job search and relocation reimbursements to affected workers⁸. The Department of Labor (DOL) administers the TAA. A related program, Worker Adjustment, Retraining and Notification (WARN) Act, introduced in 1988, requires that employers with one hundred or more employees provide 60 days advance notice of a planned closing or mass layoff of fifty employees or more⁹.

What are the TAA numbers for Illinois? How have they changed since the inception of the program in 1975? Employees from which industry and from which geography (metro / nonmetro county) accounts for the most TAA applications? Do the numbers justify the popular belief among community developers that deindustrialization has disproportionately affected rural communities in Illinois? This paper addresses these and other similar questions.

Methodology

Data for the study came from the DOL; TAA petitions data for the period May 15, 1975 to September 30, 2020 were extracted from the organization's website (www.dol.gov). Our interest is in (data) pattern analysis, make sense of the data; no theory is assumed. Both visual summary of the data (for example, stem-and-leaf display) and numeric summarization (for example, order statistics) were obtained. Geographical location of the TAA applicant (metro or nonmetro Illinois) and industry affiliation of the petitioner (for example, professional services) were used as 'batches' or groups for data analysis. All industry references in individual applications were converted into their 2-digit NAICS codes¹⁰.

Results

Number of TAA Petitions

Table 1 shows the cumulative TAA petitions, since 1975, for both the metro and the nonmetro regions. In line with the population numbers, one-in-four petitioners have been from the nonmetro region. Majority of the petitioners, about nine out of ten, from both the metro and the nonmetro regions were employed in the manufacturing sector at the time of their TAA petition. Given the high number of petitions for manufacturing, in the following pages data analysis will focus primarily on the manufacturing sector.

⁸ See GAO Report 04-1012: *Trade Adjustment Assistance: Reforms Have Accelerated Training Enrollment, but Implementation Challenges Remain*.

⁹ IIRA has been tracking WARN notices during the Covid-19 pandemic; for the latest report, see http://www.iira.org/wp-content/uploads/2020/10/WARN_Covid-19_Research-Brief-October-25-2020.pdf

¹⁰ From 1975 to 2007, only SIC codes were reported; these codes were converted to NAICS classifications.

Table 1: Cumulative Number of TAA Applications in Illinois: 1975-2020; Classified by Geography and Industry

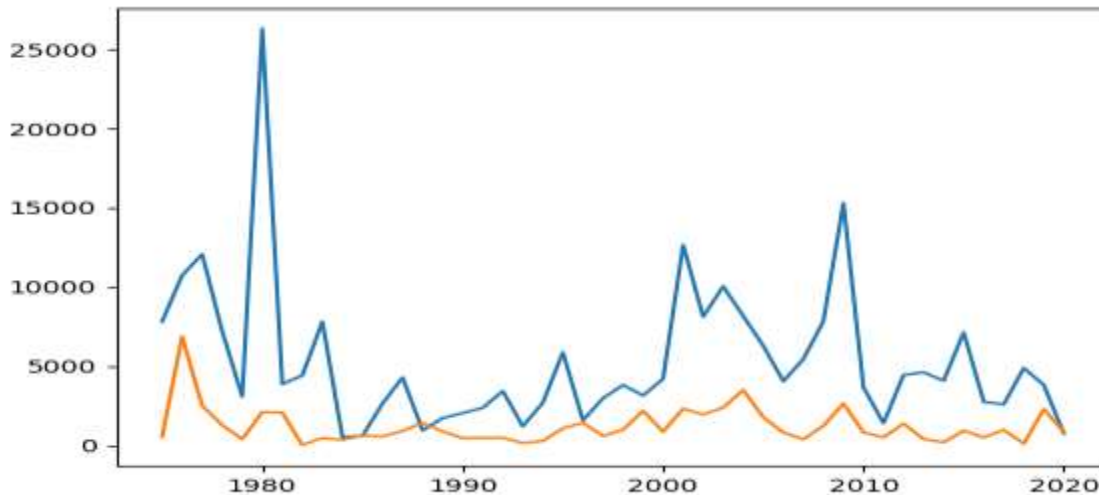
Sectors	Metro	Nonmetro	Total Illinois
NAICS 11 Agriculture, forestry, fishing and hunting	0%	0%	0%
NAICS 21 Mining, quarrying, and oil and gas extraction	1%	6%	2%
NAICS 22 Utilities	0%	0%	0%
NAICS 23 Construction	0%	0%	0%
NAICS 31-33 Manufacturing	88%	90%	88%
NAICS 42 Wholesale trade	3%	0%	2%
NAICS 44-45 Retail trade	1%	1%	1%
NAICS 48-49 Transportation and warehousing	3%	0%	3%
NAICS 51 Information	2%	2%	2%
NAICS 52 Finance and insurance	0%	0%	0%
NAICS 53 Real estate and rental and leasing	0%	0%	0%
NAICS 54 Professional and technical services	2%	0%	2%
NAICS 55 Management of companies and enterprises	0%	0%	0%
NAICS 56 Administrative and waste services	1%	1%	1%
NAICS 61 Educational services	0%	0%	0%
NAICS 62 Health care and social assistance	0%	0%	0%
NAICS 71 Arts, entertainment, and recreation	0%	0%	0%
NAICS 72 Accommodation and food services	0%	0%	0%
NAICS 81 Other services, except public administration	0%	0%	0%
All Sectors (Total Cumulative Applications)	245019	55559	300681

Trends in TAA Petitions

Figure 1 plots the time trends in TAA petitions for both metro and nonmetro Illinois; the curves covary or move together. The correlation between these two curves is 0.5; the Fretchet test for similarity of curves also suggests that the metro and the nonmetro curves are similar¹¹. Numerically, for both metro and nonmetro, TAA petitions have posted negative growths since 1975 (Figure 1).

¹¹The discrete Fretchet distance between the curves, metro (blue line in Figure 1) and nonmetro (orange curve in Figure 1), is 4.5. A score of 0 would suggest perfect fit.

Figure 1: Trends in TAA Petitions: Metro and Nonmetro Geographies



Note: Metro curve is blue; ACGR for TAA applications for both the geographies = -0.016

Rural Deindustrialization?

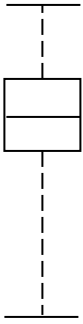
Seventy percent of manufacturing dependent counties are nonmetro (Thomas and Campbell, 2018). This information leads to at least three propositions that can be tested with TAA data: (i) that TAA petitions from the manufacturing sector would be more prevalent in rural Illinois; (ii) a higher proportion of manufacturing workers in rural Illinois would submit TAA petitions, and (iii) nonmetro would have many extreme observations or TAA petitions compared to the region's average number of TAA petitions.

Data analysis reveals that the percentage of counties in the metro region that had manufacturing workers petition the TAA for assistance is the same as that of the nonmetro or rural Illinois, 85%. Furthermore, there is no evidence that a greater number of rural, manufacturing workers are petitioning the TAA for job assistance (Table 2). Finally, the reasoning that the rural region would have extremely large number of TAA petitions, compared to the average, is also rejected by data (Figures 2 and 3).

Table 2: Percentage of Manufacturing Workforce in Illinois Petitioning the TAA: Metro and Nonmetro Regions

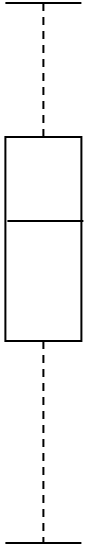
	Time Period									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
No. of Urban Mfg. Workers	695778	681002	671482	665728	655538	654508	663173	660212	658965	650221
No. of Rural Mfg. Workers	110721	108604	104181	102094	100491	102239	102128	103217	103210	103055
No. of Urban TAA Petitions	12281	2531	789	2308	4126	3155	6408	2009	1317	2442
No. of Rural TAA Petitions	2513	813	461	849	388	147	568	418	963	105
% of Urban TAA Petitions to Total No. of Urban Mfg. Workers	2%	0%	0%	0%	1%	0%	1%	0%	0%	0%
% of Rural TAA Petitions to Total No. of Rural Mfg. Workers	2%	1%	0%	1%	0%	0%	1%	0%	1%	0%

Figure 2: Schematic Plot, Five-Number Summary, and Stem-and-Leaf Display for TAA Petitions in Rural Illinois

Schematic plot	Number summary		Stem-and-leaf display Unit: 1000
	LE LH M UH UE	10 468 866 1,680.25 6873	10 (min) 0 0112334444 5555556668889999 1 00123444 89 2 112334 56 3 5 4 5 6 9 6873 (max)

Note: The typical number of petitions (M) in any year is 866; the hinge spread or deviation around the typical value is 1212 (Upper Hinge (UH) – Lower Hinge (LH)). An observation would be classified as an outlier if it exceeds the ‘step’, defined as $1.5 \times \text{hinge spread} = 1.5 \times 1212 = 1818$. The observations that are beyond this ‘inner fence’ are 3500, the number of petitions in 2004, and 6873 (Upper Extreme (UE), number of petitions in 1976). In other words, these two years are atypical for TAA.

Figure 3: Schematic Plot, Five-Number Summary, and Stem-and-Leaf Display for TAA Petitions in Metro Regions

Schematic plot	Number summary		Stem-and-leaf display Unit: 1000
	LE	511	511 (min)
	LH	2,646.25	0 5679
	M	4,059.5	1 2467
	UH	7,181.25	2 046677
	UE	26321	3 01147889
			4 01234469
			5 49
			6 3
			7 12888
			8 12
			9
			10 07
			11
			12 17
			13
			14
			15 3
			16
			17
			18
			19
			20
			21
			22
			23
			24
			25
			26 3

Note: The typical value, the number of TAA applications in any year = M = 4,059. Similar to the rural region, the metro also has two outliers: 15300 in 2009 and 26321 in 1986.

Discussion

Loss of jobs in manufacturing could be explained in a simple way by using the concept of categorization¹²; businesses in manufacturing sector have different determinants of success. For some, skilled workforce is the determinant (for example, pharmaceuticals); for others it is cheap labor. Industries that rely on cheap labor include textiles, toys, and electronic assembly; these industries tend to move manufacturing offshore. In businesses such as autos, proximity to demand is a necessity and this explains why US manufacturers are more likely to add plants in Asia than in the slower-growing economy at home.

Appendix 1 lists the manufacturing companies in rural Illinois that have had workers file for TAA petitions. Most of the products that these companies manufacture require either labor-saving equipment or cheap labor, for example, baseball caps, canned vegetables, work uniform, and writing pads and stationary. Appendix 2 lists the rural counties that had workers participate in the TAA program. Both of these tables could assist county economic developers think about their county's determinants of success in manufacturing, that is, skilled workforce and/or labor-saving production processes, the "and/or" conjoining is to remind economic developers that companies are looking to locate in places where there is skilled workforce in engineers and a start-up ecosystem.

Summary and Conclusion

Manufacturing sector accounts for the majority of TAA petitions since the enactment of the act in 1975. Contrary to the common belief among Illinoisans that rural regions have experienced the most job losses because of globalization, TAA petitions are equally distributed in both the metro and the nonmetro regions of Illinois.

For many, the mental model of globalization is ships full of relatively low-value-added goods sailing around the world; this was the reality 10 years ago¹³. Today, in all types of manufacturing, automation has become the norm. To run and maintain the machines, companies are looking for engineers; in conclusion, skilled workforce is the answer for economic development.

¹² Categorization is the mental means we have for inferring invisible properties from visible ones; for example, the concept "manufacturing industry" lets one infer that it has a factory to make tangible items, has workers and pays wages, etc. (Athiyaman, 2019).

¹³ Presently, only 18% of goods is exported from a low-wage country to a high-wage one; see Lund, S. (2020). *Globalization in transition: The future of trade and value chains*.

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NAICS	326291	327113	327120	327125	327210	327213	331110	331210	331221	331521	332312	332323	332420	332422	332510	332510	332510	332911	332991	333111
	Consumer Goods	Ferrite Components	Ceramic Refractory Products	Ceramic Refractory Products	Glass Tile, Candle Holders, and other Glass Press Ware	Glass Containers	Carbon Wire Rod	Cold Drawn Mechanical Tubing and Electrical Resistance Welded (ERW)	Hot and Cold Rolled Steel	Die Cast Parts for Automotive, Commercial Drive Train	Structural Storage Racking Systems	Bar Grating	Pressure Vessels	Over-the-Road Tanks	Builder Hardware	Builders Hardware	Propane Tanks	Water Valves for Appliances	Balls and bearings	Grain Storage, Material Handling, Conditioning, and Drying Equipment, etc.
Arcelor Mittal									290											
Ardagh Glass Inc.						150														
Crossville, Inc.					15															
Fair-Rite Products Corporation		34																		
Fisher & Ludlow Inc.												64								
Frantz Manufacturing Company																			29	
GSI Group, LLC																				110
Garsite/Progress LLC													121							
Konstant Products, Inc.											69									
National Manufacturing Company																	337			
National Sales Company															148					
Newell Rubbermaid, Inc.	18																			
PTC Tubular Products LLC								19												
Robertshaw																		119		
Spartan Light Metal Products										210										
Stanley-National Manufacturing Co																	52			
Sterling Steel Company, LLC							29													
Trinity Containers, LLC													72				12			
Vesuvius USA			51	61																
All	18	34	51	61	15	150	29	19	290	210	69	64	72	121	148	389	12	119	29	110

NAICS	333112	333415	333513	333999	333999	334419	334419	334510	334511	334511	334511	334519	334519	335121	335122	335122	335314	335513	336211	336310	
Company Name /Product	Sickle Guards	Air Handling Products	Automotive Brake Systems	Lighting for Residential, Commercial, Industrial	Manufacture Residential and Commercial Lighting Fixtures	Limit Switches (Electronic Switches)	Ferrite Components	Medical Devices for Motion	Torque Sensors	Switches and Transducers	Automotive Sensors	Precision Measuring and Surveying Equipment	Survey Accessories	Lighting Fixtures	Electric Lighting Manufacturer	Halogen Lights	Controls and Components	Custom Control Switches, Lighting Products, and Pressure Switches	Welded Sub-Assemblies and Stamping for Chassis and Suspension Systems	Electrical & Mechanical Fuel Pumps	
Affinia Brake Parts, Inc.			12																		
Airtex Products, LP																					38
Casey Tool and Machine Co., Inc.				4	101																
Fair-Rite Products Corp.							20														
General Electric Control Products																		43			
General Electric Lighting																					
Mattoon Lamp Plant																58					
Honeywell International										73											
Honeywell International Inc.						53															
Honeywell International, Inc.																			108		
Johnson Controls		211																			
Joint Active Systems Inc.								6													
Mattoon Lamp Plant																145					
Methode Electronics, Inc.									45												
Richland Manufacturing																					50
Robert Bosch Tool Corporation, Measuring Tools													137								
Robertshaw																					
SECO Manufacturing																34					
Sensata Technologies											168										
Sulberg USA, Inc.	40																				
All	40	211	12	4	101	53	20	6	45	73	168	137	34	0	145	58	43	108	50	38	

NAICS	336310	336312	336312	336321	336321	336321	336321	336322	336322	336340	336360	336360	336360	336369	336390	336390	336399	336399	336399	336399
Company Name /Product	Electrical and Mechanical I Fuel Pumps	Electrical and Mechanical I Fuel Pumps	Fuel Pumps and Components for Fuel	Exterior automotive Lighting	Headlights, Tail Lamps, Fog Lights for Toyota, GM	Wiring Harnesses	Wiring Harnesses/Automobile Lighting	Automotive Control Switches	Accelerator Pedal Sensors & Washer Pumps for Automobiles	Automotive Brake System Components	Automotive Seating Components	Vehicle Seating Components	Automotive Seats & Interior Door Panel Assemblies	Automotive Seat, Door and Hood Components	Automotive Components	Gaskets and Gasket Kits	Electronic Components for Airbag Sensors & Anti-Lock Braking System Module	Motorcycle Frames, Swing Arms, and Handlebars	Oil and Air Filters	Rubber and Metal Bushings
Affinia Brake Parts, Inc.										18										
Airtex Products L.P.	407	200																		
Airtex Products, LP			154																	
Champion Laboratories, Inc. DES/KDM																				137
Dana Sealing Manufacturing, LLC																32			8	
Dura Automotive Systems Dura Automotive Systems, LLC													181		136					
Hella Electronics Corporation												178								
Methode Electronics, Inc., North American Lighting North American Lighting, Inc.					413				451											
Plews, Inc.				50																
TRW Automotive U.S. LLC																				
Trim Masters, Inc.													288							
Xenia Manufacturing, Inc. Xenia Manufacturing, Inc. - Flora							42													
Xenia Manufacturing, Inc. - Olney								37												
ZF Boge Elastametal, LLC																				
All	407	200	154	50	413	42	93	451	58	18	178	181	288	136	8	32	183	8	137	40

Appendix 2

NAICS	336399	336612	337110	337215	339991	All
	Steel Automotive Parts	Sport Boats	Kitchen and Bath Cabinetry and Vanities	Metal Storage Racking	Soft Gaskets, Engine Rebuild Kits, Drive Train Rebuild Kits	
Company Name /Product						
Ach Food Company, Inc.						198
Affinia Brake Parts, Inc.						30
Airtex Products L.P.						607
Airtex Products, LP						192
American Pad & Paper, LLC						133
Arcelor Mittal						290
Ardagh Glass Inc.						150
BRP US, Inc.		322				322
Casey Tool and Machine Co., Inc.						105
Celanese Corporation						53
Celanese Emulsions Corp., Emulsion Polymers Division						11
Celanese Emulsions Corp., Solid Adhesives Division						31
Champion Laboratories, Inc.						137
Continental Tire the Americas, LLC						937
Crossville, Inc.						15
DES/KDM						8
Dana Holding Corporation					109	109
Dana Sealing Manufacturing, LLC						32
Del Monte Foods, Inc.						579
Dura Automotive Systems						317
Dura Automotive Systems, LLC						178
Dyno Nobel, Inc.						29
Eldorado Cap Company						12
Fair-Rite Products Corp.						20
Fair-Rite Products Corporation						34
Fisher & Ludlow Inc.						64
Frantz Manufacturing Company						29
GSI Group, LLC						110
Garsite/Progress LLC						121
General Electric Control Products						43
General Electric Lighting Mattoon Lamp Plant						58
Graham Packaging Plastic Products, Inc.						230
Heartland Bakery Company, LLC						100
Hella Electronics Corporation						58
Honeywell International						73
Honeywell International Inc.						53
Honeywell International, Inc.						451
Honeywell Metropolis Works						228
Incobrasa Industries, LTD						53
Interlake Mecalux, Inc.				297		297
JJ Collins Sons, Inc.						42
Johnson Controls						211
Joint Active Systems Inc.						6
Konstant Products, Inc.						69
MasterBrand Cabinets, Inc.			822			822
Mattoon Lamp Plant						145
Method Electronics, Inc.						45
Method Electronics, Inc., National Manufacturing Company						451
National Sales Company						337
Newell Rubbermaid, Inc.						148
North American Lighting						18
North American Lighting, Inc.						413
PTC Tubular Products LLC						50
Plews, Inc.						19
Protexall, Inc.						8
Quad Graphics, Inc.						44
REG Seneca Renewable Energy Group, Inc.						4
Richland Manufacturing		34				84
Robert Bosch Tool Corporation, Measuring Tools						137
Robertshaw						119
SECO Manufacturing						34
Sensata Technologies						168
Spartan Light Metal Products						210
Stanley-National Manufacturing Co						52
Sterling Steel Company, LLC						29
Sulberg USA, Inc.						40
TRW Automotive U.S. LLC						183
TSI Evolve						28
TSI Graphics						8
Titan Tire of Freeport, Inc.						107
Trim Masters, Inc.						288
Trinity Containers, LLC						84
Vestivus USA						112
Xenia Manufacturing, Inc.						42
Xenia Manufacturing, Inc. - Flora						56
Xenia Manufacturing, Inc. - Olney						37
ZF Boge ElastometalII, LLC						40
All	34	322	822	297	109	1191