

Categorization of Traded and Local Industries in the US Economy*

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1. What are Traded and Local Industries?

Based on Porter (2003) the US economy can be characterized by two kinds of industries: traded and local. Traded industries are those that concentrate in particular regions but sell products or services across regions and countries. For example, pharmaceutical preparation manufacturing in Boston or securities brokers in New York. In contrast, local industries are dispersed throughout the nation. Their presence in a particular region tends to be proportional to the region's size, since these industries primarily serve the local market. Examples of local industries would be real estate services, hospitals, or personal services such as drycleaners.

Making a distinction between traded and local industries is important analytically for both academic research and policy action due to the different contributions each makes to the US economy. In Porter (2003), traded industries were associated with 31.8% of employment but higher average wages and higher average productivity than local industries.¹ These general results have encouraged economic development policies that focus on increasing regional strength in traded industries. However, the local industries may also play an important supporting role in the overall economic growth of the region.

The earliest classification of traded and local industries was based on 1996 data, 4-digit SIC codes and state regions (Porter 2003).² However, the NAICS code definitions have changed since the original classifications were determined. This paper provides a

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¹ Productivity was defined as sales/receipts/shipments per employee by industry (p. 560).

² The classifications used in later years were determined by creating a bridge between 4-digit SIC and 6-digit NAICS. This allowed all industry classifications in Porter (2003) to be converted to the corresponding 6-digit NAICS codes.

revised methodology that better accounts for the 2007 NAICS code 6-digit descriptions and recent employment patterns.

2. Methodology to Identify Traded Industries

The methodology we use to classify industries focuses on actively identifying traded industries; all remaining industries are considered local. Although some industries have both local and traded elements, we assign each industry to either traded or local categories. In order to classify 6-digit NAICS industries as traded, we used as the main criteria a combination of high employment specialization and high concentration across US regions. We focus on the Economic Areas (EAs) as defined by the Bureau of Economic Analysis (BEA) as the region of interest. They represent 179 relevant regional markets that cover the entirety of the continental United States (Johnson and Kort, 2004). Thus, they are appropriate to identify meaningful employment patterns. Region-industry employment data was obtained from the 2009 County Business Patterns (CBP) collected by Census.

The criteria we suggest constitute only one possible way to distinguish between traded and local industries. However, we believe that our method does capture the differences between geographically specialized (traded) and geographically dispersed (local) economic activity. Because of the research and policy interest in traded industries, we are initially over-inclusive in defining particular NAICS codes as traded.

We use three alternative criteria. The first criterion asks whether *the percent of EAs with very little employment (0-10 employees) in that industry is 50% or more*. In other words, this criterion identifies industries that have employment concentrated in only a few regions. It works well to identify strongly traded industries and is the most restrictive criterion. However, it is not particularly good at classifying those industries with a mix of local and traded activities. Therefore we created a second criterion that asks if *the share of US industry employment in the top 10% EAs by employment-based Location Quotient (LQ) is 25% or greater*.³ This criterion is a combination of high

³ The employment-based industry specialization (i.e., Location Quotient) in a region in 2009 is measured by the share of regional employment in the regional industry as compared to the share of US employment

specialization and high concentration. It is less restrictive than the first criterion and it works well to identify obvious traded industries. Finally, a third criterion asks whether the *difference between LQ at the 90th percentile and LQ at the median over all EAs is 1.5 or greater* for the given industry. This criterion helps capture additional traded industries with variation in LQ, but that are not highly concentrated. It also helps identify traded activity in industries that are not purely traded or local.

Industries that met all three criteria were initially classified as traded while industries that met none were initially classified as local. For industries that met only one or two criteria, we then conducted a case-by-case examination to assess whether the industry had more traded than local components. This was done by reviewing the NAICS industry descriptions in detail as well as relying on expert opinion. As a final step we observed how industries with similar products and services (same 4-digit NAICS) were classified. We favored consistency in the traded-local classification, and so placed the marginal cases in the category that best matched similar industries by 4-digit NAICS codes.

3. Findings: Traded and Local Categorization of the US Economy

There are 1,088 6-digit NAICS (2007 definitions) in the CBP data representing almost all of the US economy.⁴ Based on our method, 778 of these 6-digit NAICS were classified as traded industries and the remaining 310 6-digit industries were classified as local. The traded industries accounted for 36.0% of total U.S. employment, 50.5% of payroll and about 91.2% of patenting activity in 2009 (see Table 1). In addition, traded industries are associated with higher wages on average than local industries (\$52,501 versus \$34,170 in 2009).⁵

in the national industry: $LQ_{i,r,2009} = \frac{\text{employ}_{i,r} / \text{employ}_r}{\text{employ}_{i,US} / \text{employ}_{US}}$, where r and i indicate the region (EA) and the industry (NAICS-6), respectively. This indicator captures the degree to which the industry is “over-represented” in terms of employment in the EA.

⁴ The CBP mainly excludes some farming and government service industries: crop and animal production (NAICS 111,112), rail transportation (NAICS 482), Postal Service (NAICS 491), pension, health, welfare, and vacation funds (NAICS 525110, 525120, 525190), trusts, estates, and agency accounts (NAICS 525920), private households (NAICS 814), and public administration (NAICS 92). The exclusions can be found on the United States Census Bureau website: <http://www.census.gov/econ/cbp/methodology.htm>.

⁵ Average wages for 2009 can be found at: <http://clustermapping.us/cluster#wage>.

Using Porter (2003) as a basis for comparison, our categorization has a net increase of 103 traded industries. This includes those that were classified in Porter (2003) as a separate natural-resource-based category, but were traded. Because this is a net gain, some previously traded industries became local and some previously local industries became traded due to changes in the economy and NAICS code definitions between 1996 and 2009. However, most industries remained in their original category from Porter (2003) suggesting that much of the US economy is relatively stable in terms of its traded and local industries.

Through the process of assigning individual 6-digit NAICS industries to either traded or local categorizations, many aggregated NAICS industry sectors (2-digit level) are divided between traded and local designations but tend to lean heavily toward one or the other. At the most extreme cases, 5 of 23 2-digit NAICS sectors contain industries that were classified as only traded or only local.⁶ The purely traded 2-digit NAICS are: 11 – Agriculture, Forestry, Fishing, and Hunting; 21 – Mining, Quarrying, and Oil and Gas Extraction; and 55 – Management of Companies and Enterprises. Since these are very location-specific industries, it is not surprising to find them all in the traded category. In contrast, the completely local 2-digit NAICS are: 44 – Retail Trade and 62 – Health Care and Social Assistance. Again, because these industries appear in almost all regions throughout the US, it is not surprising to find them all in the local category. Table 2 shows traded and local activity by 2-digit NAICS.

4. Regional Clusters Using Traded and Local Industries

Classifying industries as traded or local allows us to then group industries into traded versus local clusters. The separate traded and local clusters can allow regions to easily compare their economic performance in particular clusters to other regions that have the same clusters.

4.1. Traded Clusters

Clusters are groups of industries related by skill, technology, supply, demand, and/or other linkages. Delgado, Porter, and Stern (2014) used the 778 6-digit traded

⁶ There are officially 24 NAICS-2 sectors, but our data does not include industries in NAICS 92: Public Administration.

industries identified in this paper to create a set of U.S. Benchmark Cluster Definition (the BDC) that identify 51 traded clusters. The authors used co-location patterns and other regional data to find inter-industry linkages. These linkages were then used to group industries into clusters.

The authors created a novel algorithm using clustering analysis to generate a number of different cluster configurations, where each industry was exclusively assigned to only one cluster. The clustering function they used required measures of the relatedness between any two industries and some concrete parameter choices. The authors were then able to identify the best configuration for certain types of inter-industry linkages by using scores provided by the algorithm that could assess and compare the quality of each generated configuration. This best configuration was then adjusted based on expert assessment to determine the final set of traded cluster definitions. These definitions drive the analyses on the U.S. Cluster Mapping Website.

Traded clusters include the Biopharmaceutical cluster, the Financial Services cluster, and the Water Transportation cluster. Traded clusters tend to locate in specific regions. For example, see Figure 1 for a specialization map of the Biopharmaceutical cluster. The map shows EAs that have a high specialization, share, or both (as measured by employment) in the Biopharmaceutical cluster as compared to other EAs. For example, EAs in dark blue, such as Boston EA, have both high specialization and high share of the national employees in the cluster. Additional traded cluster maps and a detailed list of the 6-digit NAICS traded industries and their 51 clusters can be found at the US Cluster Mapping Website.⁷

4.2. Local Clusters

We used the remaining 310 6-digit local industries and grouped them into 16 local clusters, each industry assigned exclusively to one cluster. These local clusters are the same as in Porter (2003) with some adjustments to incorporate the net change in local industries. The groupings are primarily based on NAICS industry codes and descriptions. Local clusters generally serve the local market. They appear in almost

⁷ Maps with relevant cluster measures, including specialization, can be found here: <http://clustermapping.us/cluster>. A direct link to the traded industry definitions can be found here: <http://clustermapping.us/content/cluster-mapping-methodology>.

every region, regardless of the competitive advantages of a particular location. They also are exposed to little competition from other regions. As a result, a region's employment in local clusters is usually proportional to the population of that region. Moreover, the majority of a region's employment comes from jobs in local clusters (Table 1).

Examples include the Local Entertainment and Media cluster that includes movie theaters; the Local Health Services cluster that includes drug stores and hospitals; and the Local Personal Services (Non-Medical) cluster that includes childcare and hair salons. A detailed list of the 6-digit NAICS local industries and their 16 local clusters can be found at the US Cluster Mapping Website.⁸

5. Conclusion

Traded and local industries play different but complementary roles in the US economy. Traded industries employ fewer people but are responsible for almost all patents and greater average wages than local industries, whereas local industries are generally associated with employment proportional to regional population. Because traded industries are regionally specialized, but not always tied to a specific region over time, they can contribute to regional economic growth not just on their own, but also by attracting more firms who need more local services. The dynamics of traded and local contributions to regional economic growth and how traded and local clusters relate to each other are not well understood and is an area for future research.⁹ This paper makes a step towards a better understanding of this relationship by revising the traded and local classifications for today's economy.

⁸ The list of local industries and clusters can be found at <http://clustermapping.us/content/cluster-mapping-methodology>.

⁹ See Table 3 for a list of EAs with the highest and lowest ratio of traded to local employment.

6. References

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Appendix

Table 1: Comparison of Traded versus Local US Economy, 2009

	Traded	Local
No. Industries (NAICS-2007)	778	310
Employment	36%	64%
Payroll	50.5	49.5%
Patents	91.2%	5.0%

Source: County Business Patterns data and US Patent and Trademark Office data.

Table 2: Local and Traded Economic Activity by 2-digit NAICS, 2009

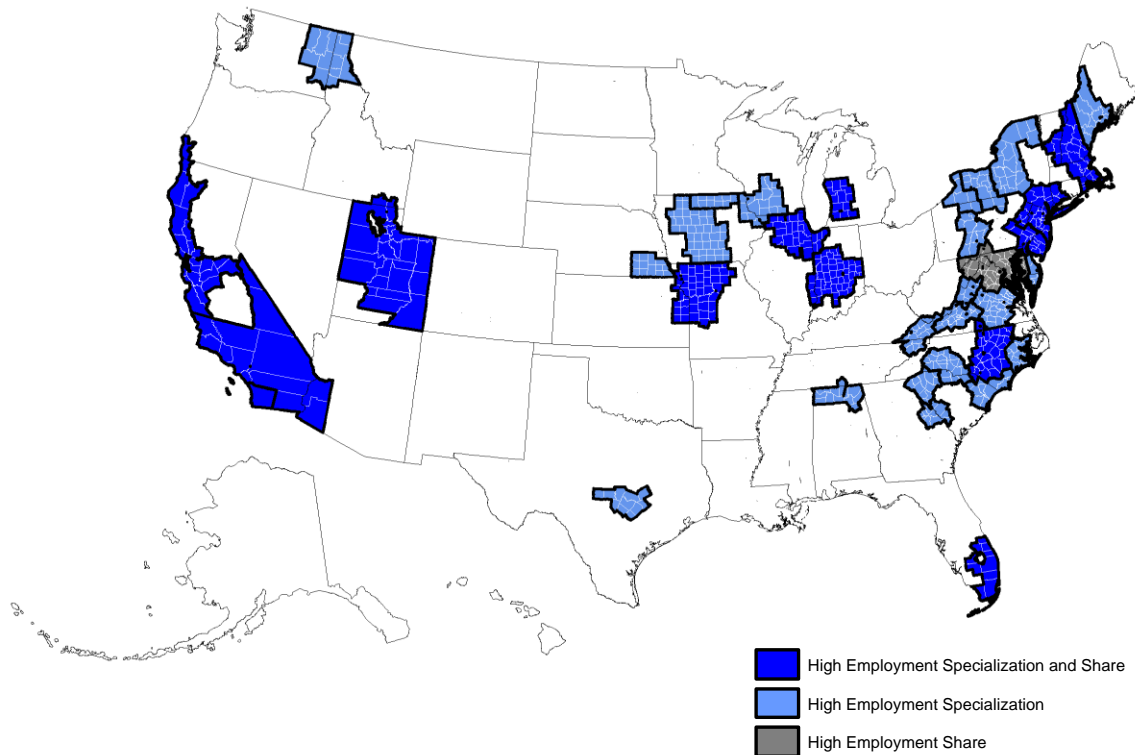
NAICS Code	NAICS Label	Industries (6-digit NAICS)		% Traded Employment
		No. of Industries	% Traded Industries	
11	Agriculture, Forestry, Fishing and Hunting	15	100%	100%
21	Mining, Quarrying, and Oil and Gas Extraction	29	100%	100%
22	Utilities	10	70%	25%
23	Construction	31	13%	8%
31	Manufacturing	110	98%	91%
32	Manufacturing	126	98%	95%
33	Manufacturing	236	98%	92%
42	Wholesale Trade	71	72%	71%
44	Retail Trade	47	0%	0%
45	Retail Trade	28	14%	7%
48	Transportation and Warehousing	48	77%	64%
49	Transportation and Warehousing	6	67%	55%
51	Information	32	78%	53%
52	Finance and Insurance	37	89%	57%
53	Real Estate and Rental and Leasing	24	29%	10%
54	Professional, Scientific, and Technical Services	47	74%	66%
55	Management of Companies and Enterprises	3	100%	100%
56	Administrative and Support and Waste Management and Remediation Services	44	48%	36%
61	Educational Services	17	65%	65%
62	Health Care and Social Assistance	39	0%	0%
71	Arts, Entertainment, and Recreation	25	88%	53%
72	Accommodation and Food Services	15	47%	16%
81	Other Services (except Public Administration)	48	2%	2%
Total All NAICS		1,088	72%	36%

Notes: Authors' calculations based on County Business Patterns data.

Table 3: Economic Areas with the Highest (Lowest) Ratio of Traded to Local Employment in 2009.

Top-5 EAs by % of Traded Employment		Bottom-5 EAs by % of Traded Employment	
South Bend-Mishawaka, IN-MI	46.1%	McAllen-Edinburg-Pharr, TX	20.1%
Fayetteville-Springdale-Rogers, AR-MO	45.5%	Sarasota-Bradenton-Venice, FL	21.8%
Appleton-Oshkosh-Neenah, WI	43.1%	Pensacola-Ferry Pass-Brent, FL	22.6%
Cedar Rapids, IA	41.4%	Greenville, NC	22.7%
Milwaukee-Racine-Waukesha, WI	40.8%	Gainesville, FL	23.4%

Figure 1: Map of Specialization in the Traded Biopharmaceutical Cluster, 2011



Notes: This map is sourced from data on the US Cluster Mapping Website, <http://clustermapping.us>. Economic Areas with **High Employment Specialization** (light blue on the map) in a cluster meet these criteria: Primary criterion: Location Quotient of Cluster Employment must be greater than the 75th percentile when measured across all Economic Areas with non-zero employment in the cluster. Secondary criterion to differentiate marginal cases: Location Quotient of Cluster Employment must be greater than 1.0, Share of National Cluster Employment greater than the 25th percentile, and Share of National Cluster Establishments greater than the 25th percentile. Economic Areas with **High Employment Share** (grey on the map) in a cluster meet this criterion: Share of National Cluster Employment must be greater than the 90th percentile when measured across all Economic Areas with non-zero employment in the cluster. Economic Areas with **High Employment Specialization and Share** (dark blue on the map) meet all of the above criteria.