Investigating the Economic Drivers of a Regional Economy: Tyler, TX

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Motivation:

• Develop a novel method in determination of traded and non-traded industry clusters who serve at the center of a regional economy.

• Discover what distinguishes these various groups of homogeneous industries.
Preliminary Analysis:

Location Quotient (Tyler MSA- USA(Base)) vs Time

- Mining, Quarrying, and Oil and Gas Extraction (21)
- Health Care and Social Assistance (62)
- Retail Trade (44)
- Wholesale Trade (42)
- Other Services (except Public Administration) (81)
Preliminary Analysis Contd.:

Location Quotient (Tyler MSA- Texas(Base)) vs Time

- Mining, Quarrying, and Oil and Gas Extraction (21)
- Health Care and Social Assistance (62)
- Retail Trade (44)
- Wholesale Trade (42)
- Other Services (except Public Administration) (81)
Research Objective:

To develop a methodology for the identification of regional economic drivers.
The Problem of Method Selection and the Trade Off
Continuum of Industrial Linkage Approach:


- They track the inter-connectedness of industrial clusters and to discover their geographical existence.

- Enables capturing of complete inter-connectedness of industries irrespective of their geographical location.

- Impossibility of policy analysis in status-quo.
Administrative Geographical Boundary Approach:


- They propose a method for the identification of industry clusters and regional economic drivers of administrative geographies.

- Enables efficient region-specific policy making.

- Captures the details in the interconnectedness of firms of a region.

- The research can be too myopic and might produce counterproductive results on a macro level.
Choice of Method and Reasons to do so:

• We choose the second approach for the identification of regional industry drivers within an administrative geography.

➢ Pervious Literature

  Macrolevel industry clusters have already been defined by Delgado Porter and Stern (2016).

➢ Regional Policy Making

  Application of macrolevel analysis blanket level analysis may often be counterproductive to the region.

➢ Understanding of the nature of regional economy

  Though great for intuition cumulative measures like G.R.P. do not capture the regional economy in a detailed fashion.
Reasons Contd.:

- Preventing counterproductive policy making
  Application of macrolevel results in the regional economy might be counterproductive. As the inter-industry linkages on a microlevel are foreshadowed.

- Accurate forecasting of policy change and business cycle effects
  Accurate prediction of the effects of any policy change is largely based on the composition of the regional economy.

- Need for a new methodology
  The methodology employed by Hill and Bernnam (2000) is very specific to Cleveland-Akron CMSA as it utilizes ES202 tax data.
Utility in Contextual Policy Making

  - Existence of industry clusters amongst Economic Areas.
  - Question of Jurisdiction?
  - Microlevel mismanagement and localized chaos.
  - Solution.
Methodology Characteristic Selection:

- **Competitiveness**
  To capture the regional, national/state-level competitiveness of the industries.

- **Exports**
  To capture if and to what extent the industry is a part of the export base of the economy.

- **Centrality**
  To accurately identify driver industries.

- **Employment Specialization**
  Specialized employment indicates high demand for goods and services provided by an industry.
The Methodology Agglomerative Hierarchical Cluster Analysis (Phase-1):

• **What is Cluster Analysis?**
  Cluster analysis is a mathematical method in which IDs are grouped based on their relative dis-similarity.

• **What is Agglomerative Hierarchical Cluster Analysis?**
  Hierarchical Cluster analysis is a bottom-up method of cluster analysis.

• **How do we discover similarity?**
  We employ Ward’s Linkage to identify dissimilarity between IDs. Here, the distance between two clusters, A and B, is how much the sum of squares will increase when we merge them.

• **Where to Stop Clustering?**
  There is no objective method.
The Methodology Discriminant Analysis (Phase-2):

• What is discriminant analysis?

  Discriminant analysis is a statistical method which checks for the adequacy of the groupings.

• Why perform discriminant analysis?

  ➢ The mathematical grouping of cluster analysis is not necessarily an indicative of accurate industrial linkage. Employing discriminant analysis checks if our grouping is accurate.

  ➢ Discriminant analysis provides us with the variables most associated with the z-score of each discriminant function i.e. the driver industries.
Findings of Phase-1 (3-Digit Classification):

Dendrogram for _clus_1 cluster analysis
Findings of Phase-1 Contd.:

• Preliminary Identification of three different industrial clusters:
  We identify the existence of three clusters based on our initial sample of three-digit NAICS codes.

• Disagreement with preliminary analysis:
  The outcome of our analysis disagrees with our initial search for a driver industry solely based on LQs.
Initial Conclusions:

• Consequence of disagreements:
  
  Our findings suggest that the intuitive statements drawn from the location quotient graphs do not capture the complete relationship.

• The drive for the driver:
  
  We find that the economy of Tyler MSA is lead by three distinct industry clusters.
Further Research:

• Perform Discriminant Analysis for our initial groupings.

• Conduct a cluster analysis for 6-digit NAICS.

• Add a variable for local competitiveness and check its impacts on our initial groupings.

• Check how different is it from Delgado Porter and Stern (2015)’s grouping for Dallas EA.
Questions??