

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

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AUBER Conference

October 2019



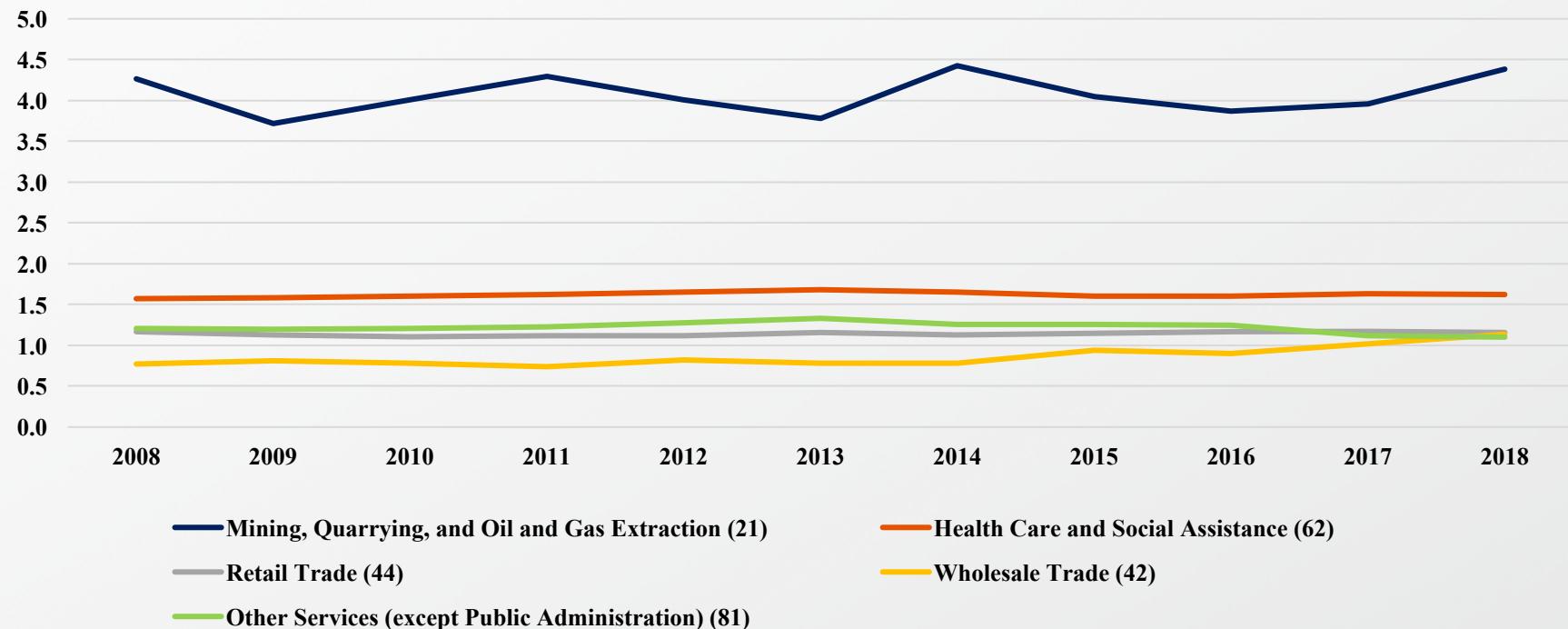
Motivation:

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- 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:

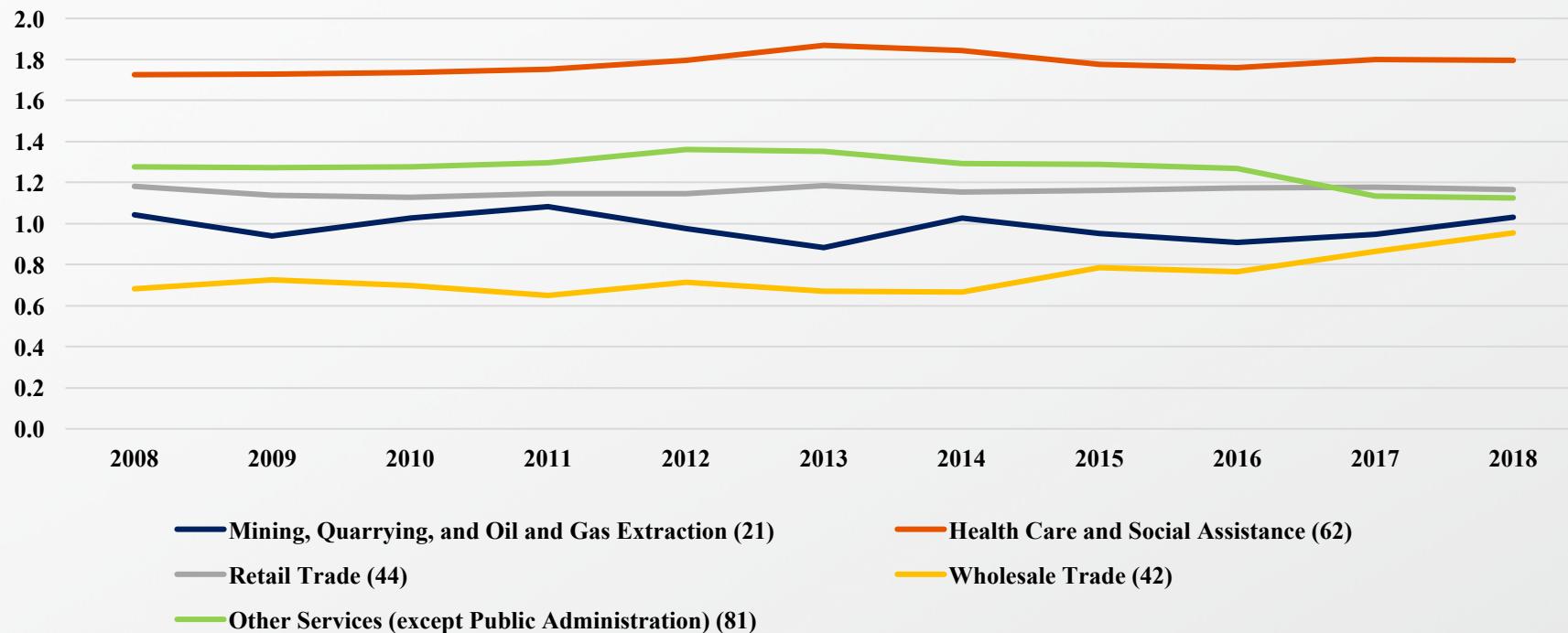
Location Quotient (Tyler MSA- USA(Base)) vs Time



Preliminary Analysis Contd.:

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



Research Objective:

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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 :

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- Gilles Duranton, Henry G. Overman, Testing for Localization Using Micro-Geographic Data, *The Review of Economic Studies*, Volume 72, Issue 4, October 2005, Pages 1077–1106.
- 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:

- Hill, E. W., & Brennan, J. F. (2000). A Methodology for Identifying the Drivers of Industrial Clusters: The Foundation of Regional Competitive Advantage. *Economic Development Quarterly*, Volume 14(1), 65–96.
 - 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:

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- 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 Bernnan (2000) is very specific to Cleveland-Akron CMSA as it utilizes ES202 tax data.

Utility in Contextual Policy Making

- Mercedes Delgado, Michael E. Porter, Scott Stern, Defining clusters of related industries, *Journal of Economic Geography*, Volume 16, Issue 1, January 2016, Pages 1–38.
 - Existence of industry clusters amongst Economic Areas.
 - Question of Jurisdiction?
 - Microlevel mismanagement and localized chaos.
 - Solution.

Methodology Characteristic Selection:

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- 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):

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- 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):

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- What is discriminant analysis?

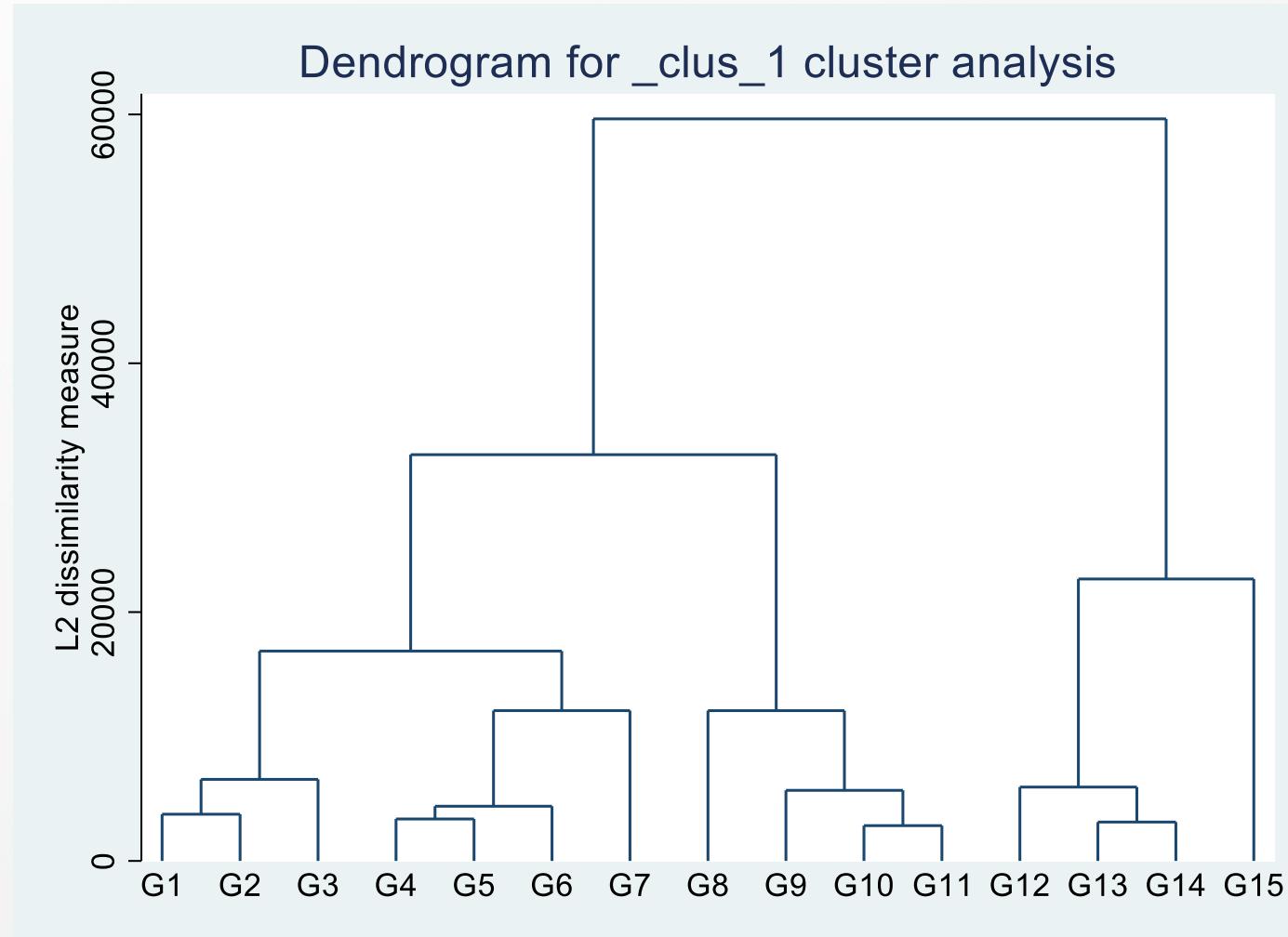
Discriminant analysis is a statistical method which checks for the adequacy of the groupings.

- 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):

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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.

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Questions??