MSA 8389 Directed Reading

Industry Trajectory Analysis

Submitted by

Professor Peter Molnar
Abraham Hardy

Institute for Insight
ROBINSON COLLEGE OF BUSINESS
Atlanta, Georgia

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Abstract

Predicting trends and movements within a given industry sector can be an incredibly difficult, time consuming and potentially fruitless endeavor. The goal of the research conducted over this semester is to show the potential to use data analysis and eventually machine learning techniques to protect changes within a given industry. Python was used to pull information from the Wharton database the most connected companies were determined using graphing methods. Once the companies were selected a set of variables were compiled to represent how well a company was doing. The variables were standardized and PCA reduction was used to reduce the variables to two principle components. Once the graphs were completed, companies were grouped by sector to establish if any similarities existed between sectors. Several sectors had graphes with similar changes in trajectory. Upon looking at the events surronding changes it trajectory it was discovered that each change in trajectory on the graph corresponded to a major event affecting the company. Each of the companies narrtives have been examined to be the basis for moving from a descriptive model to the ultimate goal of predictive model of industry forces.

Contents

Chapter 1

Indstrusy Research

1.1   Introduction

The research began by looking at the supply chain database created by Wharton. This database contained a list of companies and who they supplied to organized by year using the unique identifier gvkey. Using the gvkeys of the supplier as the source and the gvkeys of customers as destinations a directed graph was created to determine the most connected companies for each year. Throughout the years several companies appeared over and over.

1.2   Process

This small group of regularly highly connected companies became the base group for our research. Twenty-seven companies were divided into nine sectors: Automotive, Retail, Oil, Computers, Hardware, Telecommunication and Conglomerates. Several variables were selected to represent how well the companies were doing. Some of the variables included were total assets, net income, total sales and stock holder equity.

Once the variables were compiled, they were standardized and a PCA reduction was performed. This allowed all twenty-seven companies to be compared side by side. Trends were noticed immediately regarding General Motors and Ford Motor Company. Once the selected companies were divided into smaller graphs, still using the original standardization and PCA from the large graph, more trends were noticed.

One of the most striking trends within in an industry was the similarities between Home Depot and Lowe's. The graphs had similar trajectories and then both changed trajectories in the same direction around the same time and then once again changed back to the original direction at the same time. Both changes in direction coincide with the begin and end of the house market crash. The oil industry has a whole has a lot of similar trajectories in the graphs for each of the companies, most noticeably between Exxon and Shell.

As research began into the history of each of the companies and the events transpiring during each of the changes in trajectory one major theme occurred over and over. Nearly every change in a company's trajectory coincided with a major event for the company. From the housing market crash in the hardware industry to AT&T being bought by what was at the time a spin off company to the oil industry reacting to the changes in oil prices in the mid 2000's.

The discovery of the changes in graph trajectories has led to an increased emphasis on telling the story of each company. The following sections of this paper are narratives of the major changes in each company's graph and how those changes are representative of major events affect each company.

Chapter 2

Narratives

2.1 Company - Name and Graph

2.2 Timeline

Chapter 3

Conclusion

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References

[1] ¡Name of the reference here¿, `<urlhere>`

[2] ¡Name of the reference here¿, `<urlhere>`