Analysis of US Airline Stocks Performance Using Latent Dirichlet Allocation (LDA)

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Abstract

Our data account for aviation news of airlines, airports, regulations, safety, accidents, manufacturers, MRO, incidents, aviation training, general aviation and others from Aviation Voice. First, we mine the aviation related data through text mining and topic modeling. Second, we employ the LDA model approach to help us identify and capture the extent of certain topics mentioned in aviation voice news releases. Finally, we use Event Study Methodology (ESM) to investigate stock price reactions to news announcements. Eventually, we succeed in extracting 10 topics.

Introduction

- Use aviation digitized information to analyze the performance of US airline stocks
- Qualitative information is contained in news announcements
- Data account for aviation news of airlines, airports, regulations, safety, accidents, manufacturers, MRO, incidents, aviation training, general aviation and others from Aviation Voice
- Use a natural language processing, Latent Dirichlet Allocation (LDA) to investigate and search for patterns that can explain the movement of US airline stock

Latent Dirichlet Allocation

- For each document, a distribution over topics is selected randomly
- Next, the process continues for each word in the document

Methodology

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Conclusion

- Content of news announcements conveys information that are reflected in the stock market prices
- Not all the news that have impact or transmit important message on the stock prices
- Tagging of news articles categorizes articles superficially and is not sufficient

Findings/Data

2016 to 2020, 1716 news articles from Aviation Voice

Future Research

- To get more comprehensive results, electronic articles from other aviation sources can also be included. Additional research can be conducted to extend the period of study and verify the robustness of our approach.
- Some news articles have strong relationship among them, but LDA model suppose that documents are independent from one another. When inferring the topics, the position of individual words is disregarded. Different methods of topics extraction should be studied to perform a comparison with the LDA.

For More Information

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References