Will the Changes of Information Gathering Behaviors Affect the Financial Market?

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Agenda

- Introduction
- Methodology
  - Data Preparation
  - Data Exploration
  - Find the best model and the best Δt
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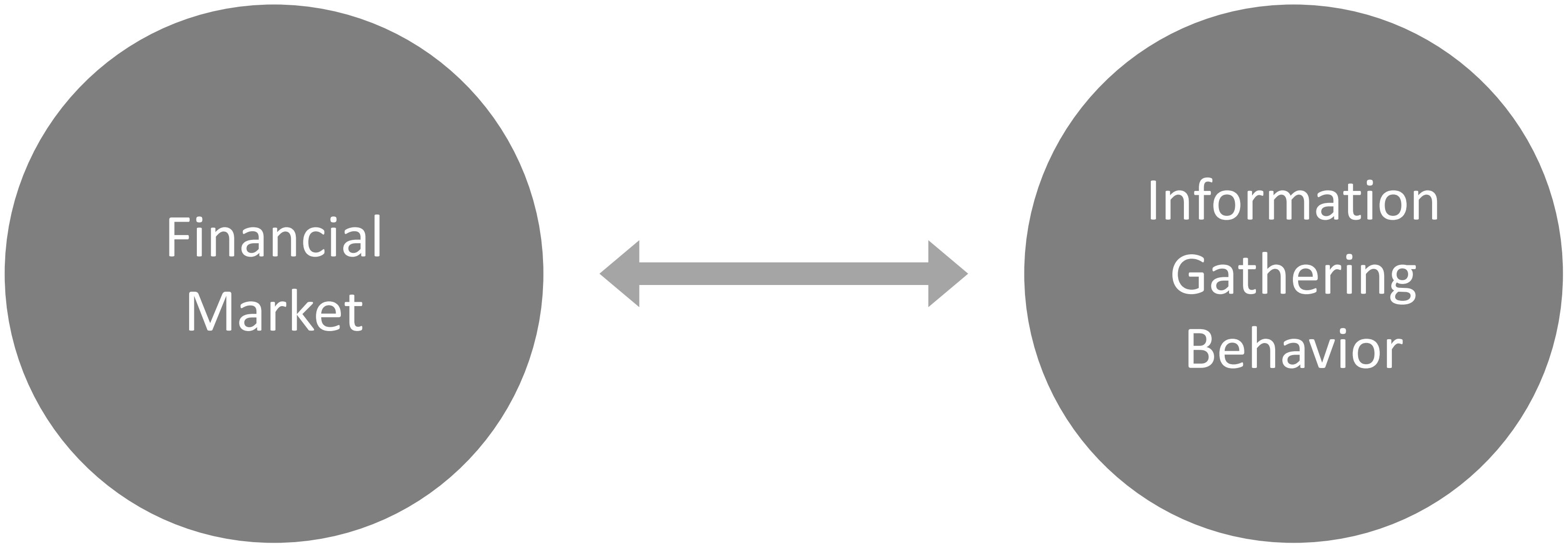
Introduction



Methodology
Data Preparation

44 terms

5 years

Search Volume	inflation	… …	Relative Change
2012-12-17			1.333
2013-01-10	Δt = 3		
… …			
2017-11-30			

Information Gathering Behavior

Financial Market

S&P 500	Price	Relative Change
2012-12-17		0 (Price↑)
2017-11-30		1 (Price↓)

Methodology
Find the best model and Δt

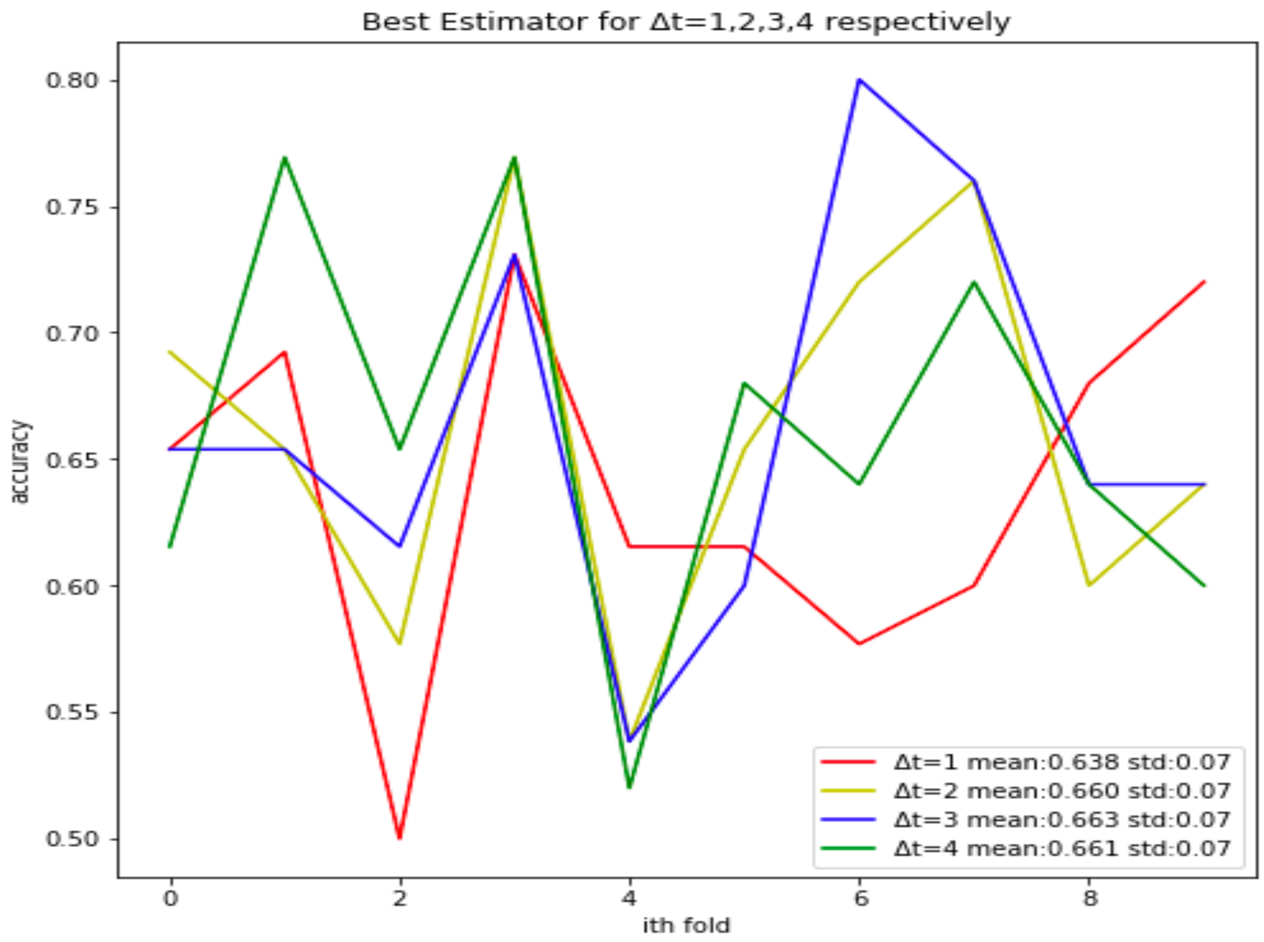
1. Tune parameters for three models including SVM, RandomForest, and Logistic Regression. Get the best combination of parameters for each model based on the mean accuracy rate obtained from cross-validation (cv=5).
2. Find the best model between SVM, RandomForest and Logistic Regression for a specific Δt.
3. Repeat step 1 and 2 for Δt=1, 2, 3 and 4.
4. Compare the selected models for a specific Δt to get the best model and Δt.

Methodology
Find the best model and Δt

Δt=[1,2,3,4]

Model	Parameters
SVM	• c=[0.001, 0.01, 0.1, 1, 10, 100, 1000] • kernel=['poly', 'rbf']
RandomForest	• max_features=['sqrt', 'None'] • min_samples_split=[2,3,4,5]
Logistic Regression	• c=[0.001, 0.01, 0.1, 1, 10, 100, 1000] • penalty=['l1', 'l2']

Results



When Δt =3 and the model is RandomForest (max_features=None, min_samples_split=4), the estimator has the highest accuracy rate (mean=0.663, std.=0.072).

Conclusions

- The relative search volume change for some words, which are highly related to investor concern over the past several weeks can reflect investor's decisions on the stock market. It causes the change of the stock price.

- In conclusion, the period between the online key terms searching of investors and the decision makings from investors would cause notable changes in the financial market and this period is 3 weeks.

References

- Preis, T., Moat, H. S., & Stanley, H. E. (2013, April 25). Quantifying Trading Behavior in Financial Markets Using Google Trends. Retrieved November 23, 2017, from https://www.nature.com/articles/srep01684

Thank you !