Lobbying Efforts and Market Outcomes

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Introduction and Problem Statement

Lobbying is a multi-billion dollar business. Its purpose is to influence politicians to take actions that benefit the interests of companies.

The goal of our project is to determine whether or not lobbying benefits a company's stock valuation. If so, how much lobbying is optimal?

Formalism

Lobbying Ratio:

$$R_i = \frac{(\text{Lobbying Costs for Quarter } Q_i)}{(\text{Total Assets Reported for Quarter } Q_{i-1})}$$

Relative Market Performance:

$$P_{i,d} = \langle \text{Percent Change of Company's Stock Price from Start of } Q_{i+1} \text{ to Future Date} \rangle_{\text{Future Dates in } Q_{i+1+d}} - \langle \text{Percent Change of S\&}P\,500 \text{ Stock Price from Start of } Q_{i+1} \text{ to Future Date} \rangle_{\text{Future Dates in } Q_{i+1+d}}$$

Research Question:

Is there a correlation between the lobbying ratio and relative market performance? If so, then what is the optimal ratio that maximizes a company's relative market performance?

Lobbying Measures of Interest

1. **Count:** Number of lobbying instances registered for a company

2. **Income:** Reported income received by lobbying firms (from companies)

3. **Expenses:** Lobbying costs incurred by lobbying firms (reported on behalf of their clients)

4. **Total:** Sum of income and expenses

$$Total = Income + Expenses$$

5. **Income ratio:** income/total assets

$$Income\,ratio = \frac{Income}{Assets}$$

6. **Expenses ratio:** expenses/total assets

$$Expenses\,ratio = \frac{Expenses}{Assets}$$

7. **Total ratio:** total/total assets

$$Total\,ratio = \frac{Total}{Assets}$$

Data Collection

The Lobbying Disclosure Act (1995) requires lobbyists to disclose their activity in quarterly filings that are publicly available.

Lobbying Data:

- Lobbying Disclosure Act API (LDA)*
  - Webscraped the OpenSecrets lobbying data to create a smaller dataset for cross-checking

Market Data:

- NASDAQ (US Companies): Initial list of companies
- SEC Data (US Companies): Company total assets
- `yfinance`: Company and S&P 500 adjusted closing prices

*Dataset Created by Rahul Krishna
**Subject to minimal processing

Data Processing: Company Assets

1. Select US companies in the NASDAQ
2. Select companies that have submitted quarterly balance sheets (10-Q forms)
3. Add assets data from each form, for each company
4. Remove duplicate tickers corresponding to the same company
    a. E.g., GOOG vs GOOGL

	end	val	quarter	year
0	2011-12-31	6331000000	Q4	2011
1	2012-06-30	14928000000	Q2	2012
2	2012-09-30	16038000000	Q3	2012
3	2012-12-31	15103000000	Q4	2012
4	2013-03-31	15163000000	Q1	2013
5	2013-06-30	15724000000	Q2	2013
6	2013-09-30	14933000000	Q3	2013
7	2013-12-31	17895000000	Q4	2013
8	2014-03-31	19028000000	Q1	2014

Assets Data for Meta Platforms, Inc. (META)

Data Processing: Lobbying Data

1. Match every client's name to the best fitting company name in SEC Assets Record (using `rapidfuzz`)
2. Filter out entries with unmatched clients
3. Add data on each quarter per company
4. Calculated the income, expenses and total relative to company's assets

year	quarter	sector	industry	count	income	expenses	total
2013	1	Technology	Software—Infrastructure	23.0	1057500.0	2530000.0	3587500.0
2013	2	Technology	Software—Infrastructure	23.0	980000.0	2960000.0	3940000.0
2013	3	Technology	Software—Infrastructure	23.0	987000.0	2230000.0	3217000.0
2013	4	Technology	Software—Infrastructure	24.0	1070000.0	2770000.0	3840000.0
2014	1	Technology	Software—Infrastructure	22.0	937000.0	2080000.0	3017000.0
2014	2	Technology	Software—Infrastructure	22.0	987000.0	2340000.0	3327000.0
2014	3	Technology	Software—Infrastructure	22.0	855000.0	1660000.0	2515000.0
2014	4	Technology	Software—Infrastructure	21.0	805000.0	2250000.0	3055000.0
2015	1	Technology	Software—Infrastructure	23.0	865000.0	1890000.0	2755000.0

Lobbying Data for Microsoft Corp (MSFT)

Modelling Approach

We have studied the data using two types of models.

Linear Model: Linear Regression

Classification: The relative market performance P was split into three categories:

1. $P > 5\%$
2. $-5\% \leq P \leq 5\%$
3. $P <$ -5%

Classification Models: Logistic Regression, SVM, kNN, ensemble models built from these models, and others*

*Other models give comparable performance

Results

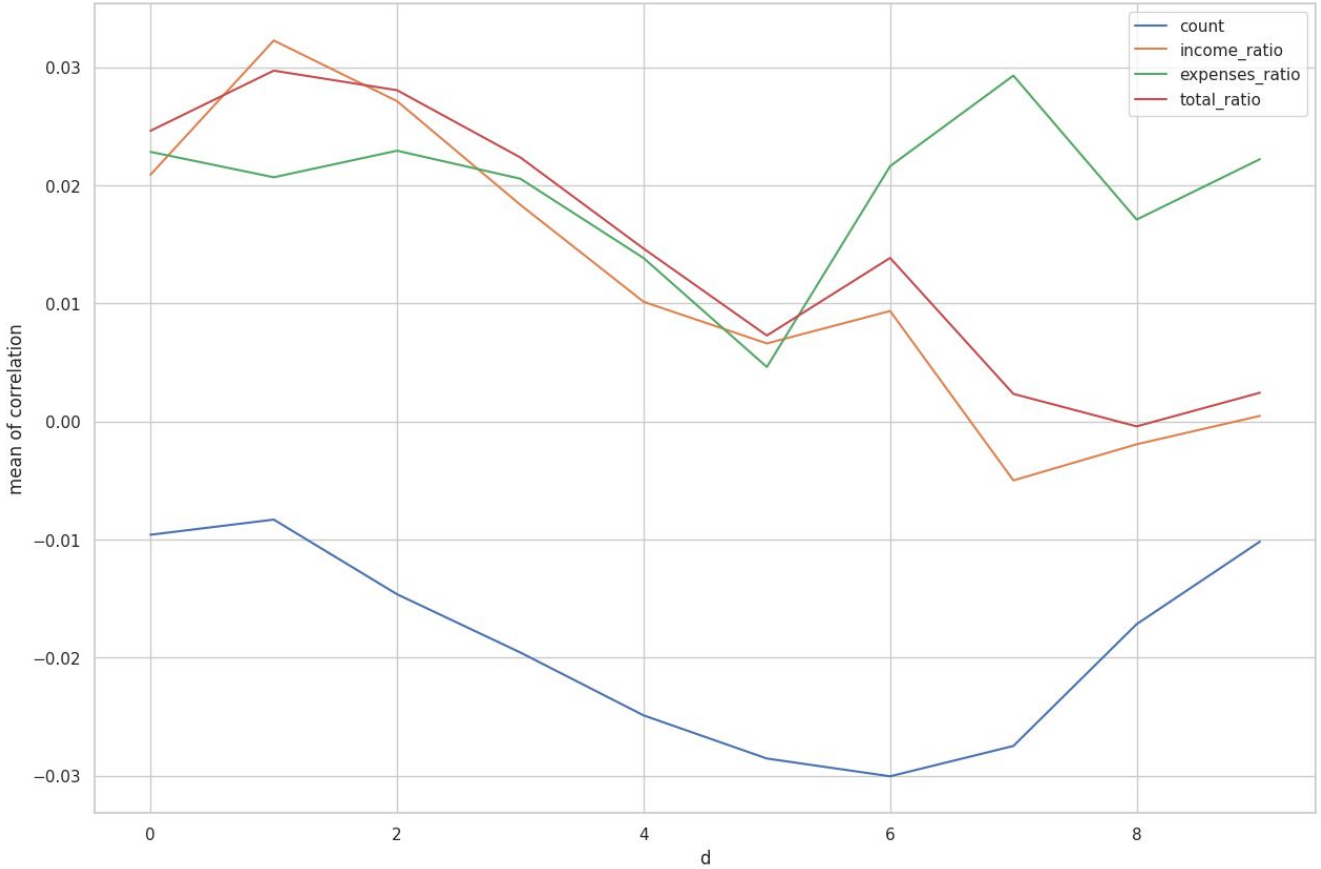
Time window (d): 5 quarters

Linear Regression R-Squared: -.0024

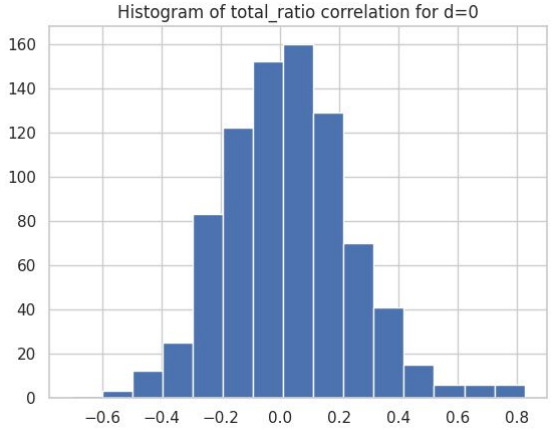
Classification Accuracy Scores:

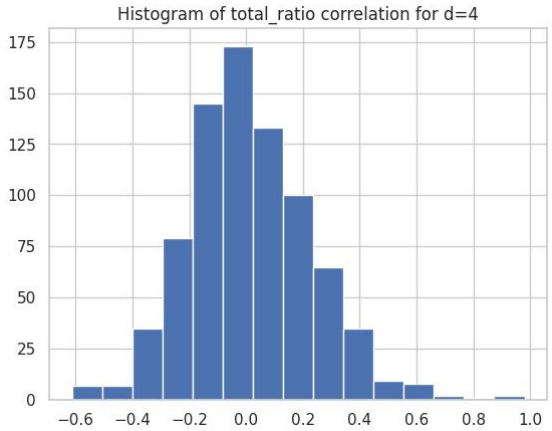
- Logistic Regression: 0.56
- kNN: 0.53
- SVM: 0.56
- Combination: 0.56

Correlation Analysis



Correlation Analysis





	count	income_ratio	expenses_ratio	total_ratio
count	834.0000	814.0000	281.0000	825.0000
mean	-0.0083	0.0323	0.0207	0.0297
std	0.1987	0.2238	0.2012	0.2162
min	-0.6342	-0.7360	-0.4750	-0.7360
25%	-0.1423	-0.1260	-0.1242	-0.1202
50%	-0.0144	0.0207	0.0180	0.0168
75%	0.1153	0.1670	0.1654	0.1647
max	0.7311	0.8155	0.7002	0.8155

Summary of the correlations for d=0

	count	income_ratio	expenses_ratio	total_ratio
count	812.0000	789.0000	273.0000	801.0000
mean	-0.0249	0.0101	0.0138	0.0146
std	0.2029	0.2157	0.2119	0.2189
min	-0.7259	-0.6128	-0.5619	-0.6128
25%	-0.1586	-0.1457	-0.1215	-0.1315
50%	-0.0413	-0.0026	-0.0031	-0.0044
75%	0.1029	0.1514	0.1557	0.1515
max	0.6793	0.9796	0.9279	0.9796

Summary of the correlations for d=4

Issues

1. Positive externalities
    a. Some companies may spend a lot less - or nothing at all - on lobbyists. In these cases, those companies that spend less may still benefit from the lobbying expenses of others.
    b. Next steps: look at dynamics within sectors and do more contextual research.

2. Only see one universe of outcomes
    a. Due to the nature of the data generating process, we only see the universe of outcome where companies pay lobbyists; we do not see the alternative.
    b. One potential next step may be to isolate controversial bills which some companies support and others do not. We therefore should be able to determine success based on whether a bill is past or not and how many resources it took.

Next Steps

- We also collected sector data from the S&P 500
  - Making within sector analysis possible.

- Identify controversial bills.

- Identify politicians that are more susceptible to lobbying efforts
  - Voters should be aware that their representatives can be “bought”.
  - Lobbying firms may wish to target politicians that have a track record of “compliance”.

Conclusions

- Analysing market outcomes is extremely difficult as there are many factors that can affect a company's income and growth other than lobbying activities.
  - International/national events that affect the economy
  - Legal issues
  - Growth begets growth
  - Finite resources
  - Competition in the market

The question of whether lobbying “works” would benefit from alternate research designs with a more clearly defined scope of cases instead of a large N-analysis.