ALEXANDRIA TECHNOLOGY

Text to Alpha α

Comparative Analysis of Earnings Calls

Alexandria
TECHNOLOGY

Alexandria Technology

The Modern Day Library for a Big Data World

- High Quality Sources reviewed and validated as an Alpha Source
- Accurate classification for the financial domain

Alexandria Technology helps investors make better decisions with data

- Outputs that are Uncorrelated to Traditional Factors
- Consistent alpha capture since our launch in 2012.

Alexandria TECHNOLOGY

The Alexandria Alpha Library

News Analytics

Dow Jones News Wire
Coverage: Global Companies
Macro, Commodities
Languages: English
History: 2000

Global Press Releases
Coverage: Global Companies
Languages: English
History: 2004

Benzinga
Coverage: Global Companies
Languages: English
History: 2008

Midnight Trader
Coverage: Global Companies
Languages: English
History: 2012

Nikkei
Coverage: Japanese Companies
Languages: Japanese
History: 2011

Web / Social

Reddit Stocks
Coverage: 6,000+ US Companies
Languages: English
History: 2017

Reddit Crypto
Coverage: 6,000+ Coins
Languages: English
History: 2018

Blogs
Coverage: 20,000+ Global Companies
Languages: English
History: 2017

Long Form Documents

Factset XML Transcripts
Coverage: Global Companies
Languages: English
History: 2000

EDGAR SEC Filings
Coverage: US Companies
Languages: English
History: 2000

ESG

Transcripts ESG
Coverage: Global Companies
Languages: English
History: 2000

News ESG
Coverage: Global Companies
Languages: English
History: 2000

Factset Earnings Call Transcripts

1.7 million global company corporate events

- Earnings Calls
- Conference Presentations
- Guidance Call
- Sales & Revenue Call
- Investor Meeting

Region	Count	Type	Start Date
Africa	120	Entities	2004
Asia	1,370	Entities	2003
Europe	2,530	Entities	2003
Latin America	270	Entities	2003
Middle East	160	Entities	2003
North America	8,350	Entities	1999
Pacific	510	Entities	2003

Topic Parsing of Calls

MD Section 39

The refining environment also remains extremely challenged. BP's refining marker margin averaged $5.90 in the second quarter compared with $15.20 a year ago, reflecting sharply reduced product demand and significantly lower industry refining utilization.

MD Section 40

Turning finally to gas markets where the weaker economy has further reduced demand and worsened the pre-existing oversupply in the market, US Henry Hub gas price averaged $1.70 through the quarter, the lowest in 25 years. NBP and JKM averaged $1.60 and $2.10 in the quarter.

Field	MD-39	MD-40
ID	2408599	2408599
Call_Time	8/04/2020 19:20:13	8/04/2020 19:20:13
Received_Time	8/4/2020 21:33:00	8/4/2020 21:33:00
Ticker	BP	BP
Country	USA	USA
ISIN	US0378331005	US0378331005
Section	MD-39	MD-40
Sentiment	-1	-1
Confidence	0.6813	0.4555
Topic	OPS/PRODUCT	OPS/COMMODITY/GAS
Topic_Count	6	11
Name	Murray Auchincloss	Murray Auchincloss
Title	CFO& Director	CFO& Director
Affilitation	BP Plc	BP Plc
Prob_POS	0.0161	0.1166
Prob_NTR	0.1964	0.2465
Prob_NEG	0.7875	0.6369
Call_Type	E	E
Word_Count	34	46
Transcript_Type	T	T
Version_ID	4885318	4885318

NLP Approaches

Classify Factset Earnings Calls Using 3 NLP Techniques`

	Loughran – McDonald	FinBert	ChatGPT 3.5	Alexandria Technology
NLP Approach	Sentiment Dictionary	Transformer	LLM	Machine Learning Ensemble
Language Model	10-Ks and 10-Qs	Reuters TRC2-financial	Common Crawl, News Articles, Books	Earnings Call Sentences
Sentiment Training	• 4,990 financial words • 80,000+ words	FINANCIAL PHRASEBANK • 4,845 sentences • Lexis Nexis financial news • 16 people with finance backgrounds	• Not trained for a specific task	Financial Analyst Labels • 900,000+ sentences • GIC Sector Analysts

Prompting ChatGPT

You

"Act as a financial analyst reading a paragraph and predict if it would have a positive, negative or neutral impact on the stock price. Remove any non-financial text. Structure the output format exactly as {"sentiment" : "<sentiment of paragraph being one of [positive | negative | neutral]>", "sentiment_confidence": "<value between 0 and 1: your confidence in your prediction>"} and do not provide any additional descriptions:"

ChatGPT

Sure, I can do that. Please provide the paragraph you'd like analyzed.

NLP Classification Correlations

Sentiment Correlations from Individual Section Classifications

	Loughran McDonald	FinBERT	ChatGPT	Alexandria
Loughran McDonald	1.00			
FinBERT	0.40	1.00		
ChatGPT	0.39	0.54	1.00	
Alexandria	0.13	0.14	0.15	1.00

GPT 3.5 Compared to GPT 4

GPT 4 and GPT 3.5 produce similar classification for sentiment

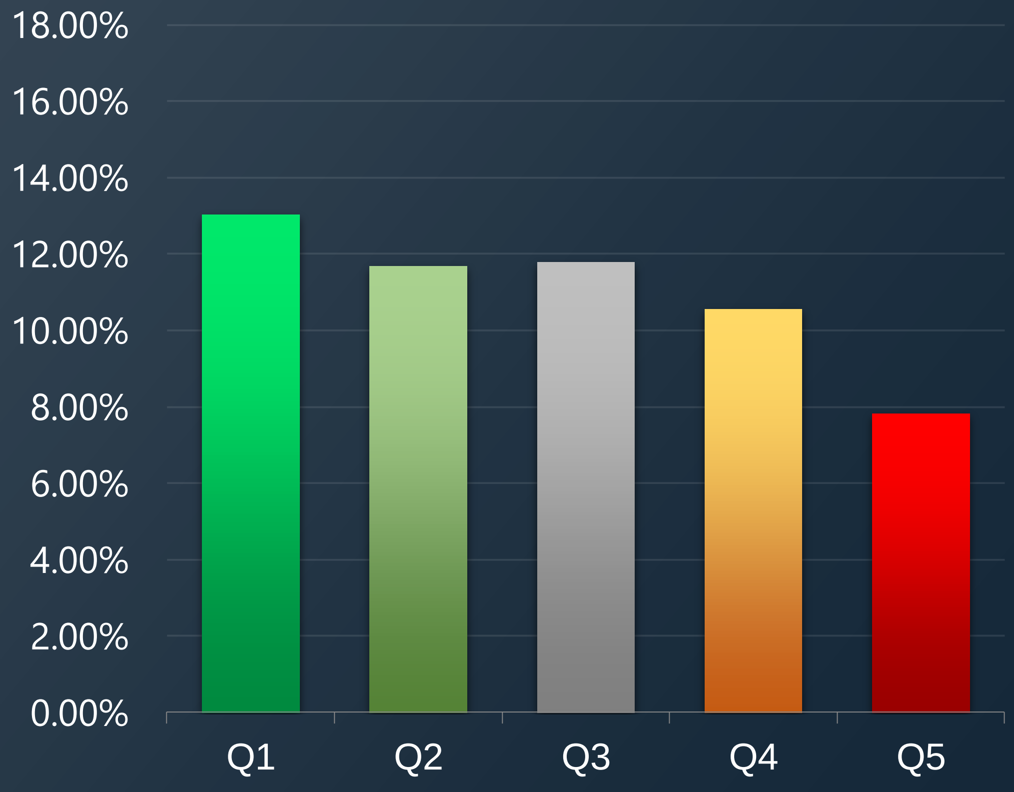
- API Cost: 1 Year for GPT 4 = 13.5 Years for GPT 3.5
- From Oct. 2020 to Nov,, 2021, match rate is between GPT3 and GPT4 is 88.2%

	Positive	Neutral	Negative
GPT 3.5	252,060	366,841	20,063
GPT 4	263,699	345,153	30,104
Match	227,705	319,667	16,205
Match %	90.3%	87.1%	80.1%

- Simulation Performance 2021: GPT 3.5 = -2.81% ; GPT 4 = -0.86%

ChatGPT

- Universe = SP500 Universe
- Period = January 2010 – September 2023
- Rebalance = Monthly
- Aggregation Window = 3 months
- Sentiment = Log10 (Count Positive+1) / (Count Negative+1))
- Call Sentiment = Avg(MD Sentiment, QA Sentiment)

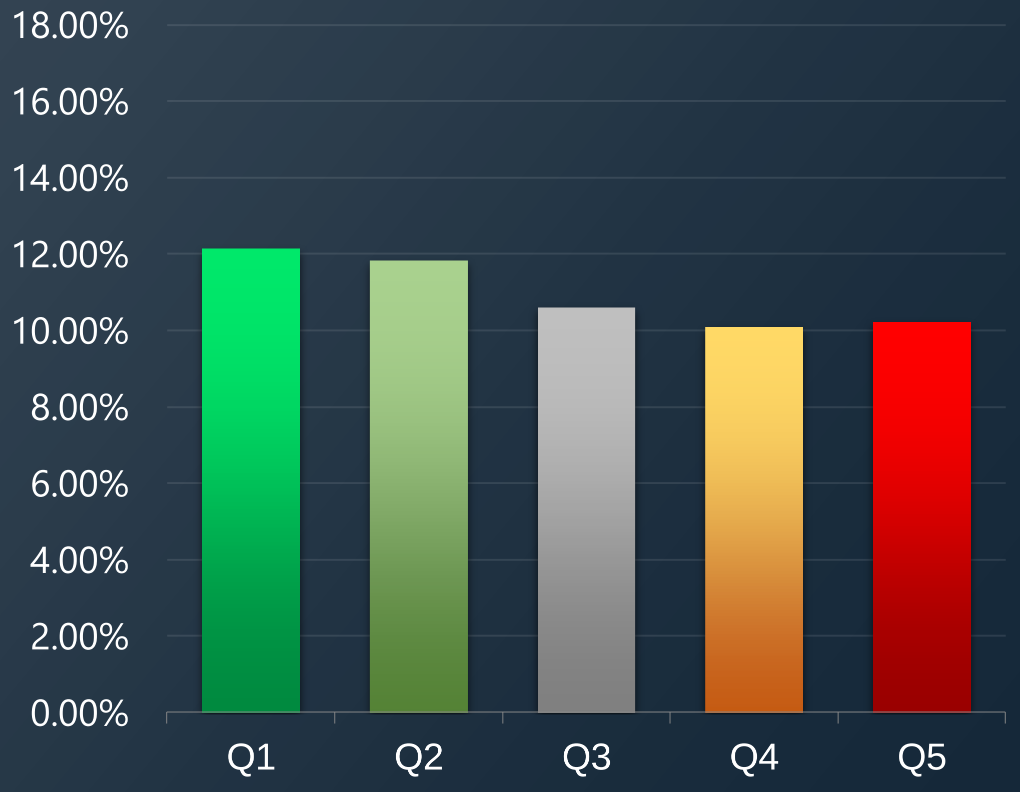


SP500 Universe: 2010-2023.09					
Quantile	**Avg Stocks**	**Annual Returns**	**Standard Deviation**	**Sharpe Ratio**	**Relative vs SP500**
1	105	13.03%	16.06%	0.81	2.74%
2	104	11.68%	16.57%	0.70	1.39%
3	104	11.79%	16.47%	0.72	1.50%
4	104	10.56%	17.22%	0.61	0.27%
5	104	7.83%	17.58%	0.45	-2.46%
Long Short	208	4.33%	6.82%	0.64	

Q1 – Q5 Annual Returns				
	Annual	**Std Dev**	**Sharpe**	**SP 500**
2010	6.73%	7.76%	0.87	12.78%
2011	5.58%	2.72%	2.05	0.00%
2012	2.77%	5.27%	0.53	13.41%
2013	3.16%	3.45%	0.91	29.60%
2014	2.85%	3.66%	0.78	11.39%
2015	13.01%	8.22%	1.58	-0.73%
2016	-6.03%	6.55%	-0.92	9.54%
2017	12.66%	3.84%	3.30	19.42%
2018	6.63%	7.81%	0.85	-6.24%
2019	-2.01%	7.22%	-0.28	30.30%
2020	3.52%	9.63%	0.37	8.34%
2021	-2.81%	9.33%	-0.30	26.89%
2022	7.22%	5.99%	1.21	-19.44%
2023	10.47%	10.87%	0.96	11.68%

Loughran McDonald

- Universe = SP500 Universe
- Period = January 2010 – September 2023
- Rebalance = Monthly
- Aggregation Window = 3 months
- Sentiment = Log10 (Count Positive+1) / (Count Negative+1))
- Call Sentiment = Avg(MD Sentiment, QA Sentiment)

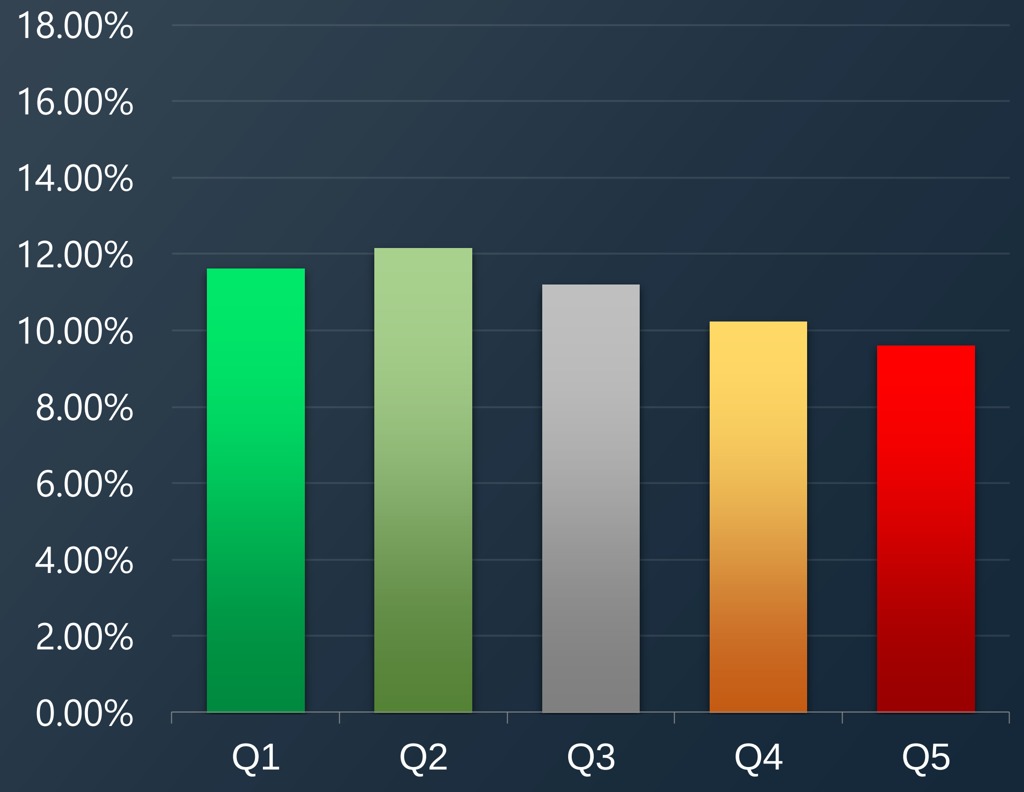


SP500 Universe: 2010-2023.09					
Quantile	**Avg Stocks**	**Annual Returns**	**Standard Deviation**	**Sharpe Ratio**	**Relative vs SP500**
1	105	12.14%	15.58%	0.78	1.85%
2	104	11.82%	16.84%	0.70	1.53%
3	104	10.60%	16.67%	0.64	0.31%
4	104	10.09%	17.24%	0.59	-0.20%
5	104	10.21%	17.39%	0.59	-0.08%
Long Short	208	**1.28%**	**5.82%**	**0.22**	

Q1 – Q5 Annual Returns				
	Annual	**Std Dev**	**Sharpe**	**SP 500**
2010	7.56%	6.65%	1.14	12.78%
2011	3.83%	6.22%	0.62	0.00%
2012	-7.49%	5.10%	-1.47	13.41%
2013	-0.11%	3.10%	-0.04	29.60%
2014	2.62%	4.52%	0.58	11.39%
2015	7.64%	7.96%	0.96	-0.73%
2016	-3.62%	5.54%	-0.65	9.54%
2017	7.11%	4.33%	1.64	19.42%
2018	0.55%	4.98%	0.11	-6.24%
2019	2.71%	5.19%	0.52	30.30%
2020	5.34%	8.58%	0.62	8.34%
2021	-10.19%	6.23%	-1.63	26.89%
2022	-0.64%	4.72%	-0.14	-19.44%
2023	5.60%	6.52%	0.86	11.68%

FinBERT

- Universe = SP500 Universe
- Period = January 2010 – September 2023
- Rebalance = Monthly
- Aggregation Window = 3 months
- Sentiment = Log10 (Count Positive+1) / (Count Negative+1))
- Call Sentiment = Avg(MD Sentiment, QA Sentiment)



SP500 Universe: 2010-2023.09

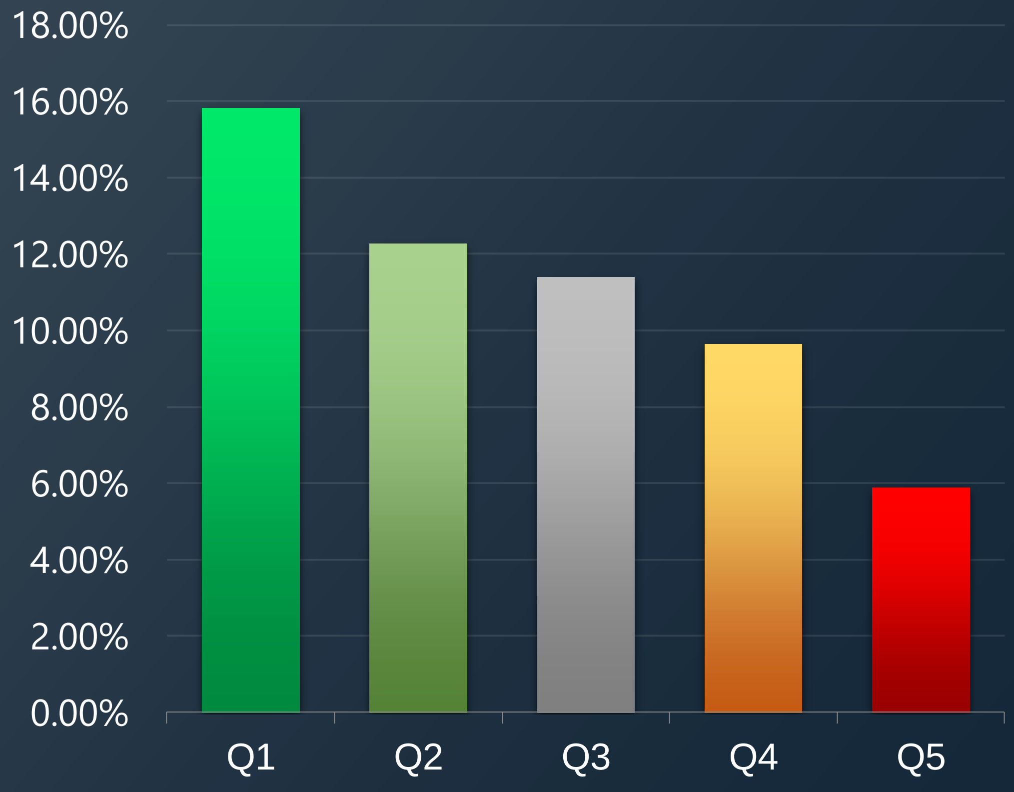
Quantile	Avg Stocks	Annual Returns	Standard Deviation	Sharpe Ratio	Relative vs SP500
1	105	11.62%	15.12%	0.77	1.32%
2	104	12.16%	16.12%	0.75	1.87%
3	104	11.21%	16.83%	0.67	0.91%
4	104	10.23%	17.47%	0.59	-0.06%
5	104	9.60%	18.45%	0.52	-0.69%
Long Short	208	0.97%	7.69%	0.13	

Q1 – Q5 Annual Returns

	Annual	Std Dev	Sharpe	SP 500
2010	1.26%	7.16%	0.18	12.78%
2011	3.64%	4.35%	0.84	0.00%
2012	-4.22%	5.28%	-0.80	13.41%
2013	0.95%	3.42%	0.28	29.60%
2014	1.22%	4.97%	0.25	11.39%
2015	15.19%	8.32%	1.82	-0.73%
2016	-12.34%	6.49%	-1.90	9.54%
2017	10.42%	3.02%	3.44	19.42%
2018	3.57%	5.43%	0.66	-6.24%
2019	-0.19%	10.60%	-0.02	30.30%
2020	9.73%	14.77%	0.66	8.34%
2021	-9.46%	9.83%	-0.96	26.89%
2022	7.08%	6.03%	1.17	-19.44%
2023	-12.34%	8.50%	-1.45	11.68%

Alexandria

- Universe = SP500 Universe
- Period = January 2010 – September 2023
- Rebalance = Monthly
- Aggregation Window = 3 months
- Sentiment = Log10 (Count Positive+1) / (Count Negative+1))
- Call Sentiment = Avg(MD Sentiment, QA Sentiment)

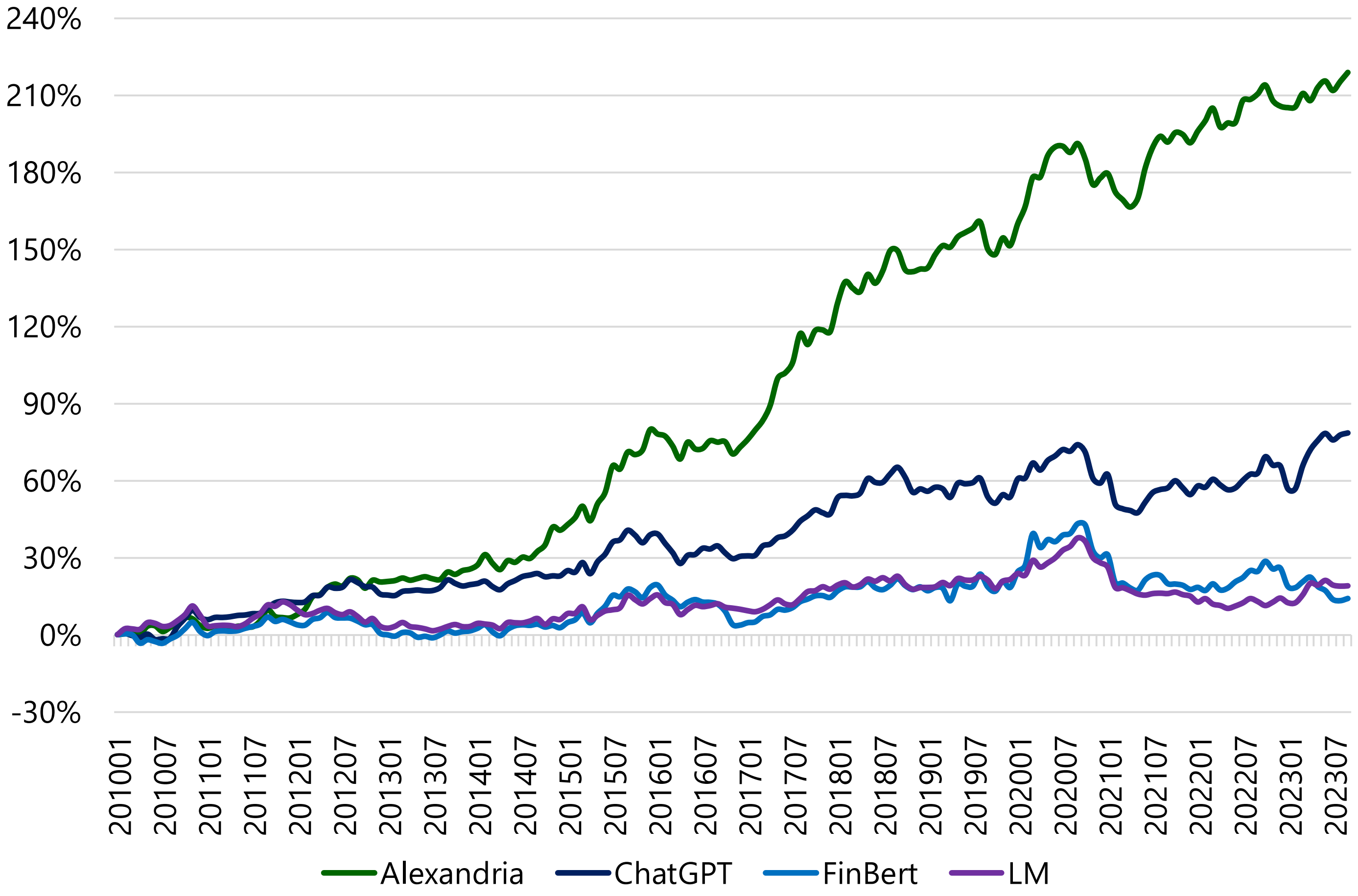


SP500 Universe: 2010-2023.09					
Quantile	**Avg Stocks**	**Annual Returns**	**Standard Deviation**	**Sharpe Ratio**	**Relative vs SP500**
1	105	15.82%	16.11%	0.98	5.53%
2	104	12.27%	16.43%	0.75	1.98%
3	104	11.39%	16.52%	0.69	1.10%
4	104	9.64%	17.15%	0.56	-0.65%
5	104	5.89%	17.78%	0.33	-4.41%
Long Short	208	**8.86%**	**6.93%**	**1.28**	

Q1 – Q5 Annual Returns				
	Annual	**Std Dev**	**Sharpe**	**SP 500**
2010	3.56%	5.89%	0.60	12.78%
2011	2.84%	5.96%	0.48	0.00%
2012	13.16%	6.63%	1.99	13.41%
2013	4.16%	3.10%	1.34	29.60%
2014	12.05%	7.81%	1.54	11.39%
2015	27.85%	9.90%	2.81	-0.73%
2016	-3.79%	6.92%	-0.55	9.54%
2017	25.97%	7.53%	3.45	19.42%
2018	11.20%	8.42%	1.33	-6.24%
2019	3.79%	6.16%	0.62	30.30%
2020	10.43%	7.89%	1.32	8.34%
2021	4.95%	6.77%	0.73	26.89%
2022	4.90%	5.26%	0.93	-19.44%
2023	5.76%	3.69%	1.56	11.68%

PnL Comparison

Alexandria’s classification outperforms in most years leading to large increase in PnL



Q1 – Q5 Annual Returns

	Loughran	FinBERT	ChatGPT	Alexandria
2010	7.56%	1.26%	6.73%	3.56%
2011	3.83%	3.64%	5.58%	2.84%
2012	-7.49%	-4.22%	2.77%	13.16%
2013	-0.11%	0.95%	3.16%	4.16%
2014	2.62%	1.22%	2.85%	12.05%
2015	7.64%	15.19%	13.01%	27.85%
2016	-3.62%	-12.34%	-6.03%	-3.79%
2017	7.11%	10.42%	12.66%	25.97%
2018	0.55%	3.57%	6.63%	11.20%
2019	2.71%	-0.19%	-2.01%	3.79%
2020	5.34%	9.73%	3.52%	10.43%
2021	-10.19%	-9.46%	-2.81%	4.95%
2022	-0.64%	7.08%	7.22%	4.90%
2023	5.60%	-12.34%	10.47%	5.76%

Explaining Differences

Loughran McDonald Dictionary

1. Dictionary based approaches can be rigid.
2. Word ordering is ignored

FinBERT

1. Language Model trained on news different from Earnings corpus
2. 4,845 sentences for sentiment is a small training base

ChatGPT

1. Language Model trained on multi-domain, mulit-media corpus
2. Sentiment is not a dedicated task

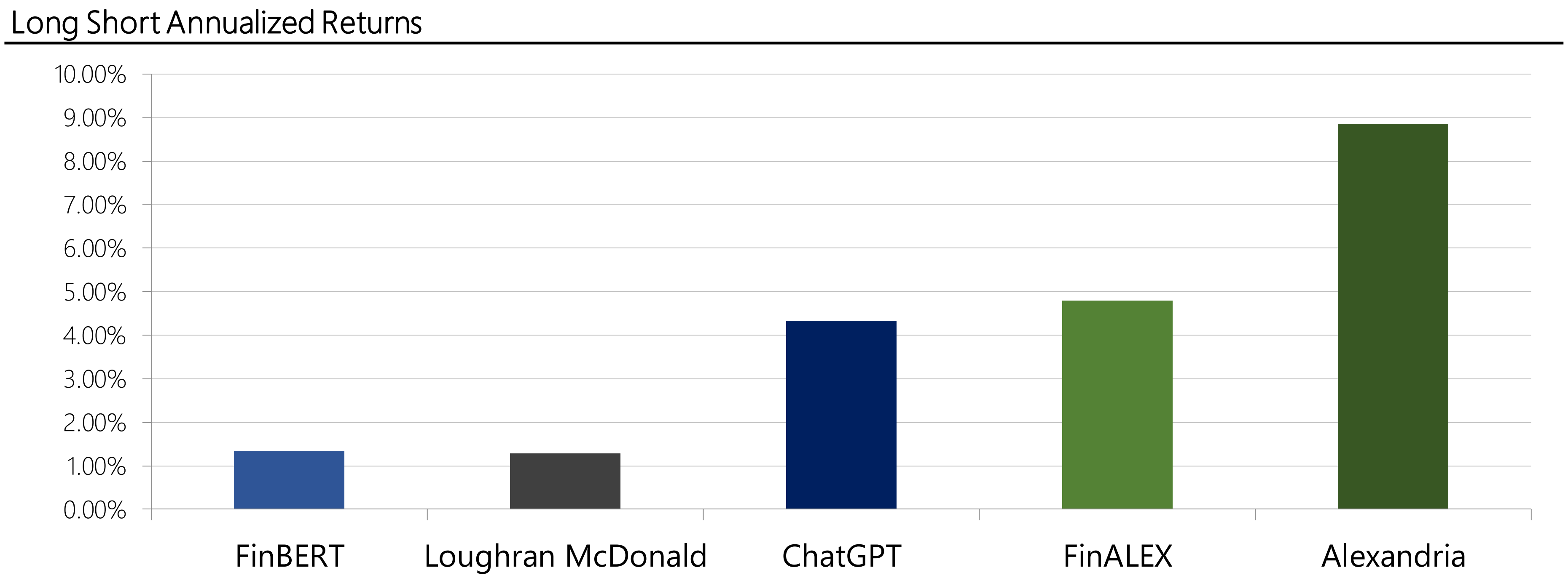
Alexandria

1. Is it Technology or Training Data?

Long Short Annualized Returns by Classifier

Using Alexandria Earnings Call Labels improves FinBERT but only half way

Alexandria's Language Model outperforming using same sentiment training data

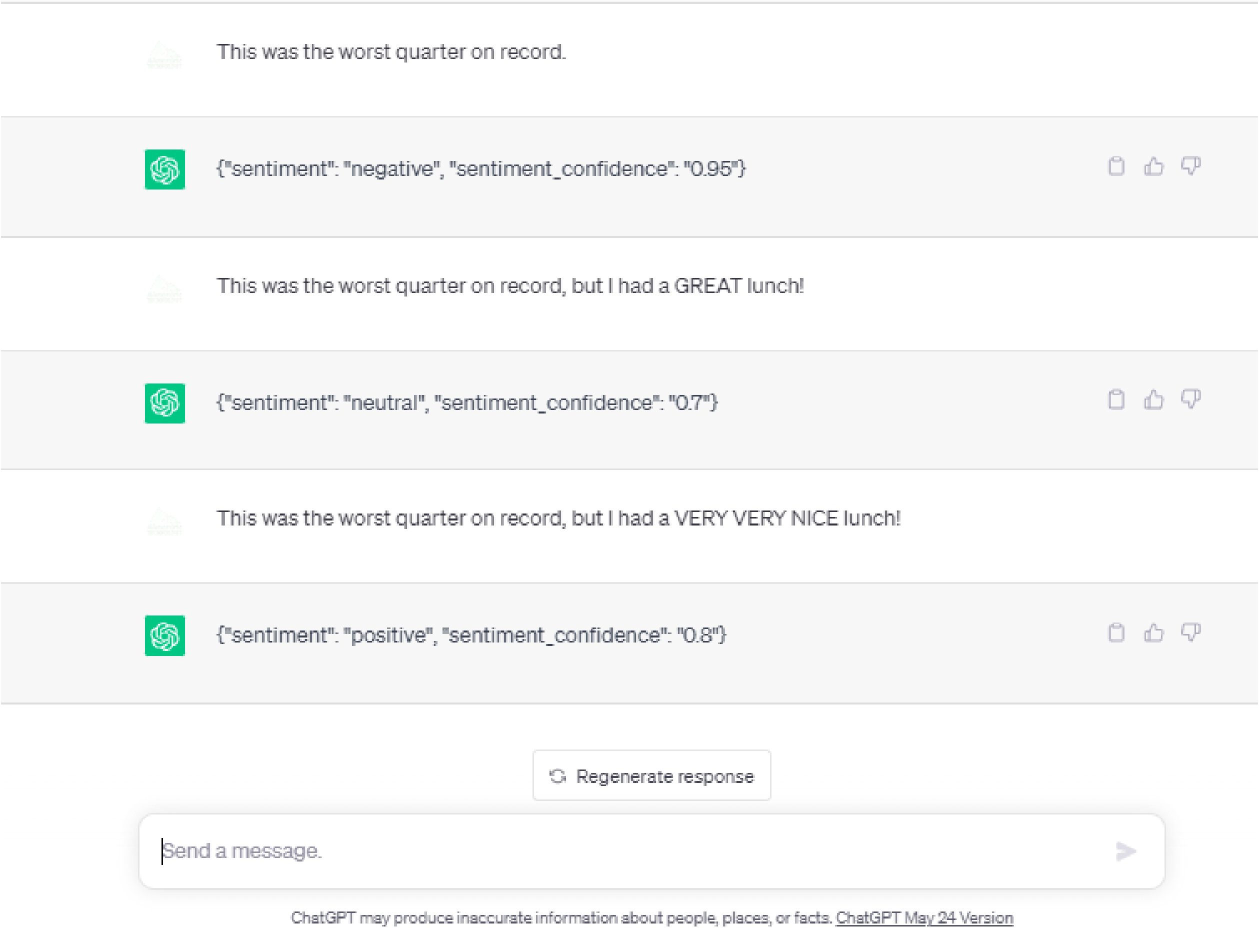


	FinBERT	Loughran McDonald	ChatGPT	FinALEX	Alexandria
Return	0.97%	1.28%	4.33%	4.79%	8.86%
Standard Deviation	7.69%	5.82%	6.82%	7.03%	6.93%
Sharpe Ratio	0.13	0.22	0.64	0.68	1.28

Classification Examples

Text	LM	FinBERT	GPT3.5	GPT4	Alex	Reason
And I'd simply say the best days for Intel are in front of us.	positive	0	positive	positive	0	Cheer
I'm really excited by the tremendous opportunities and exciting journey ahead for Coty and look forward to sharing this vision in the coming months.	positive	positive	positive	positive	0	Cheer
With all of that in mind, I continue to be excited about the opportunity ahead. And I'm happy with the progress we're making against our objectives.	positive	positive	positive	positive	0	Cheer
Hey. Good morning, guys. Nice quarter.	0	positive	positive	positive	0	Praise
Great. And congrats on another nice quarter.	positive	positive	positive	positive	0	Praise
Great. Hopefully, valuations get better.	positive	positive	positive	positive	0	Hope
We are hopeful that 2021 we'll be able to have all of the tranches completed.	positive	positive	positive	positive	0	Hope
But just as the leader of the business, I'll love to have a business where at least half of your revenue mix is coming from outside the US.	0	0	positive	0	0	Love
...but a pretty good response from our customers as a result of doing that.	positive	positive	positive	positive	0	Customer
And our spend is on track. So that is very clear.	0	0	0	positive	0	Confirmation
For 2021, the forecast for PSEG Enterprise/Other remains unchanged at a net loss of $15 million.	negative	negative	negative	negative	0	Confirmation
So, those are in-year achieved savings.	positive	positive	0	0	positive	Fundamental
The impact so far on the supply chain challenges.	negative	0	0	0	negative	Fundamental
Got you. Sorry, on the days, is that a 300 basis points headwind in Q4?	0	negative	0	0	negative	Headwind
Right. Hence why we are not getting early here and saying where you are against that range despite some nice tailwinds on COVID year-to-date of revenue.	negative	0	0	0	positive	Tailwind
And it will ramp up from that point onwards.	0	0	0	positive	0	Incomplete
We're not going to breakout those numbers right now.	0	0	0	negative	0	Incomplete
There'll be no dividend cut, by the way.	0	0	positive	positive	0	Negation
That move hurt our fourth quarter last year.	negative	0	0	negative	0	Past Tense

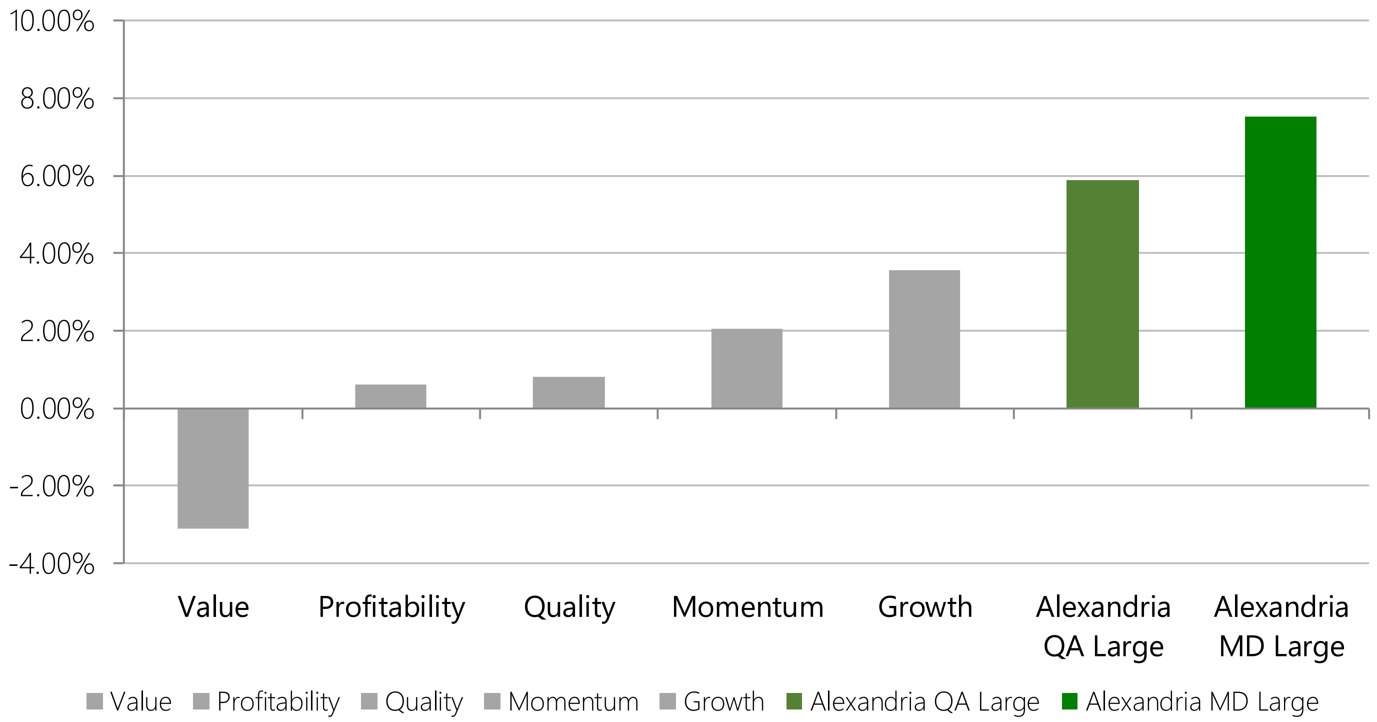
ChatGPT as an Analyst after Lunch



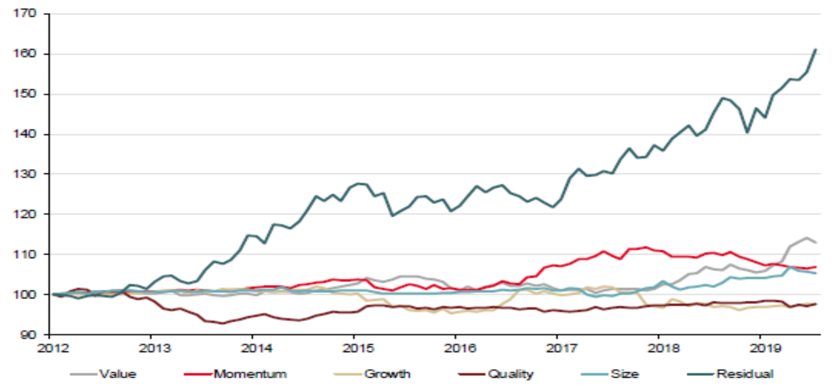
Sentiment vs. Traditional Data

- Earnings Calls QA and MD is the best factor over the last 10+ years
- Large Residual over traditional factors

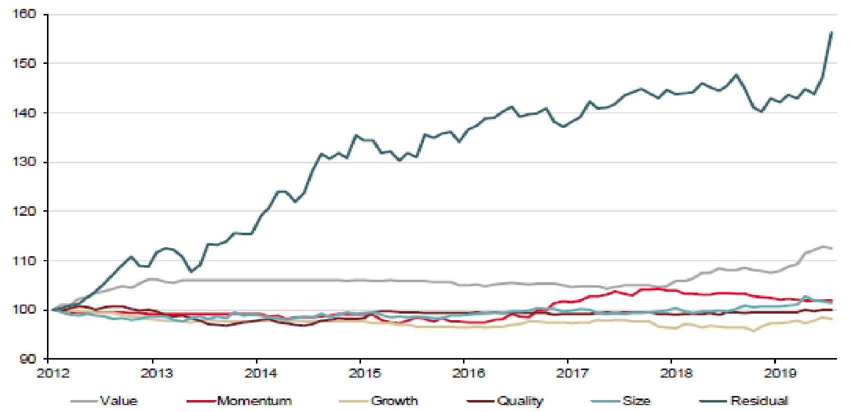
Q5 –Q1 Performance



Signal 1 – MD section: large caps return decomposition



Signal 1 – QA section: small caps return decomposition



Source: SG Cross Asset Research/Equity Quant, Alexandria, FactSet

Discovering Intelligence In Unstructured Content

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"a sentiment engine based on ideas derived from decoding the human genome… a money-spinning killer app."

The Economist

As Seen In Partner Platforms, Products & Research