

TAREA I

Jofré Elías
ejofre@fen.uchile.cl
Yunes Fayruz
fyunes@fen.uchile.cl

Question 1A: Mean-Variance Frontier

Selecting the following 40 stocks from the requested industries:

Information Technology:

1. Apple (AAPL)
2. Nvidia (NVDA)
3. AMD (AMD)
4. Visa (V)
5. Microsoft (MSFT)
6. Intel (INTC)
7. Cisco Systems (CSCO)

Utilities:

1. NextEra Energy (NEE)
2. Duke Energy (DUK)
3. Dominion Energy (D)
4. Southern Company (SO)
5. Exelon (EXC)
6. American Electric Power (AEP)
7. PPL Corporation (PPL)

Real Estate:

1. American Tower (AMT)
2. Simon Property Group (SPG)
3. Prologis (PLD)
4. Welltower (WELL)
5. Equity Residential (EQR)
6. AvalonBay Communities (AVB)
7. Realty Income Corporation (O)

Industrials:

1. Boeing (BA)
2. 3M (MMM)
3. Honeywell (HON)

4. Union Pacific (UNP)
5. Caterpillar (CAT)
6. Lockheed Martin (LMT)

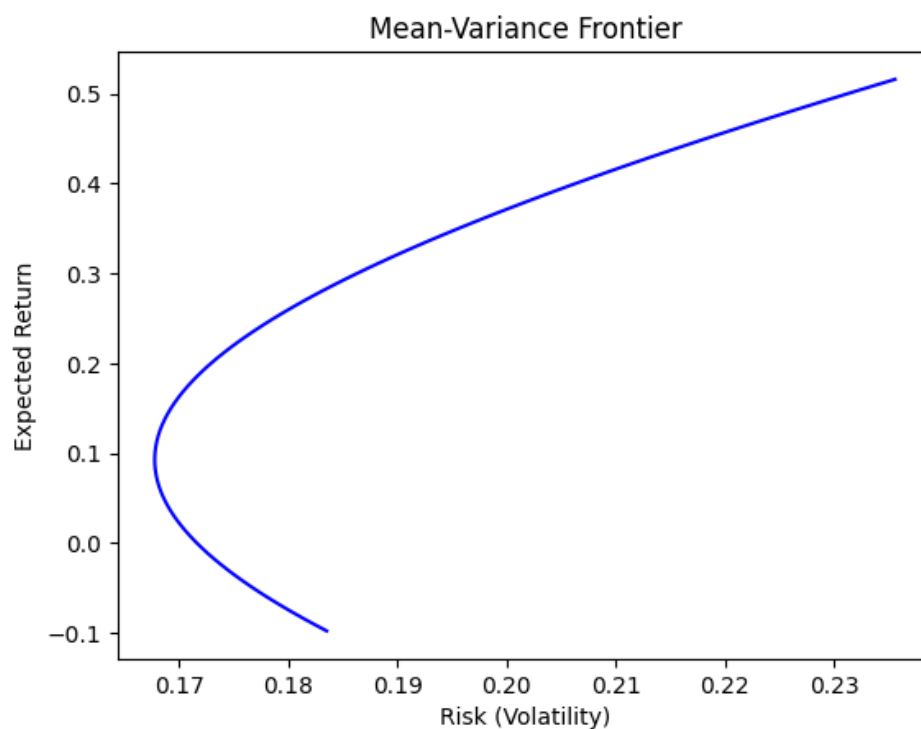
Health Care:

1. Johnson & Johnson (JNJ)
2. Pfizer (PFE)
3. Merck (MRK)
4. Abbott Laboratories (ABT)
5. Amgen (AMGN)
6. Eli Lilly (LLY)

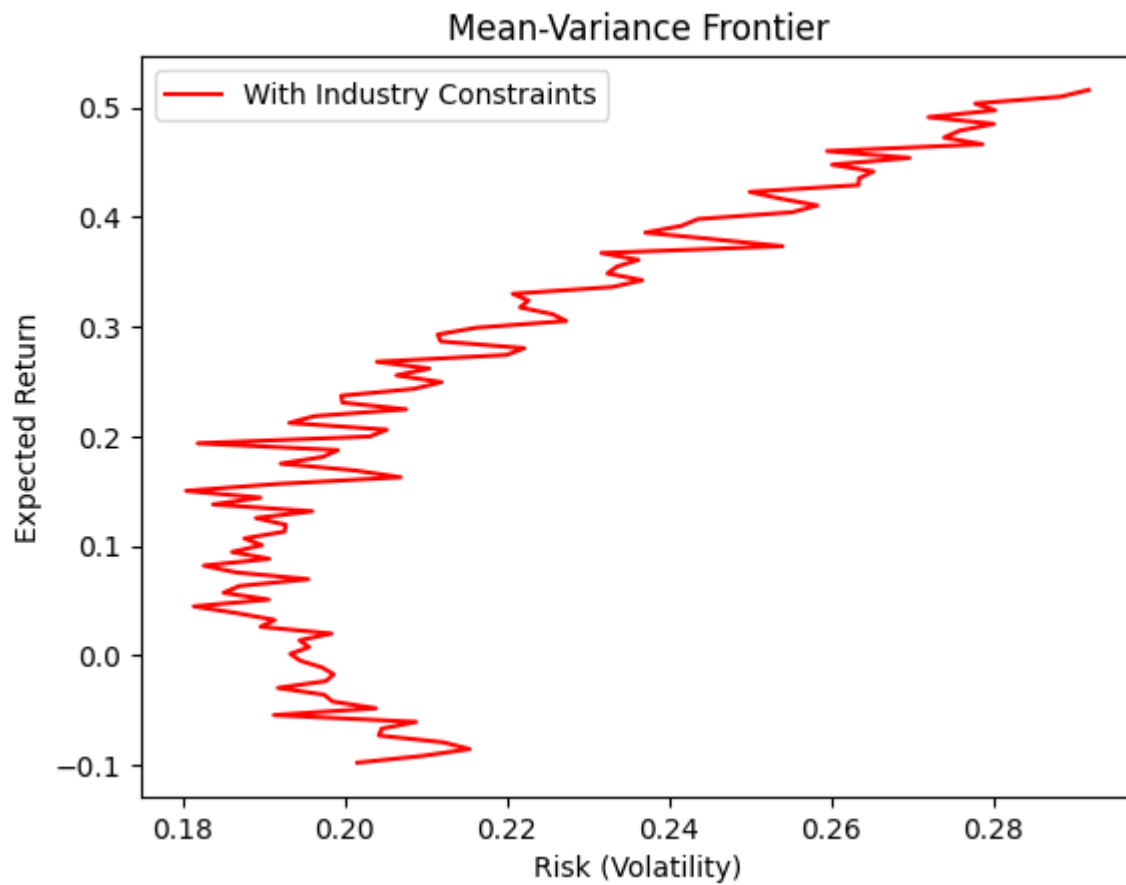
Financials:

1. JPMorgan Chase (JPM)
2. Bank of America (BAC)
3. Wells Fargo (WFC)
4. Citigroup (C)
5. Goldman Sachs (GS)
6. Morgan Stanley (MS)
7. U.S. Bancorp (USB)

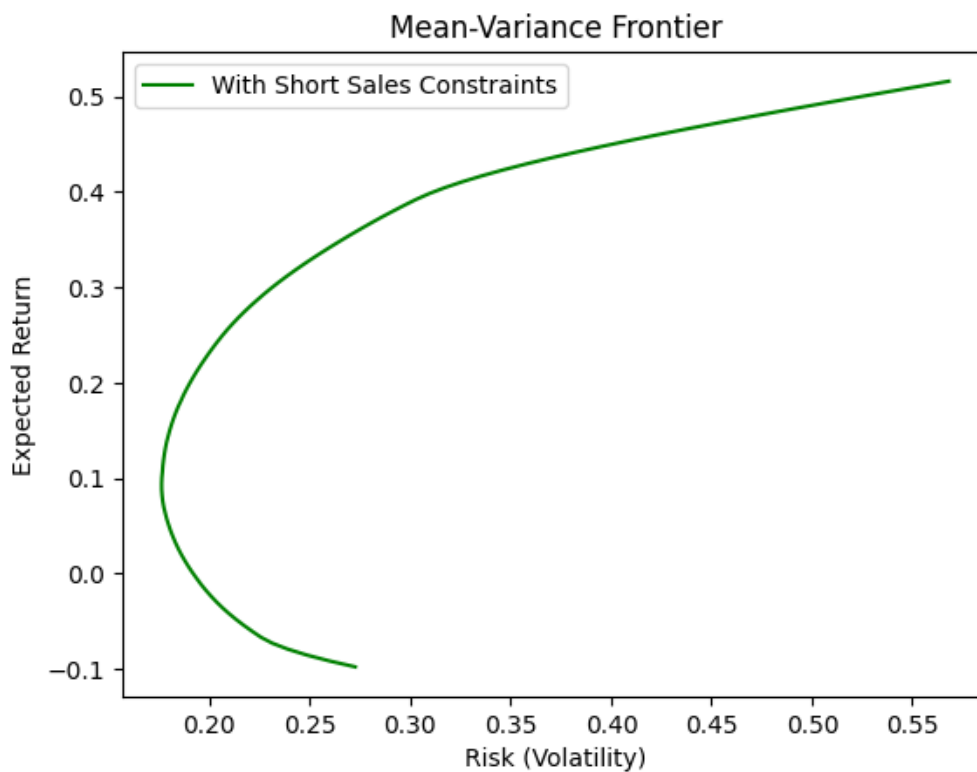
1. The expected returns and volatility of these stocks were calculated using Python in Google Colab. The pertinent code and detailed explanations are provided in the accompanying document and Appendix 1.
2. Subsequently, the mean-variance frontier was calculated.



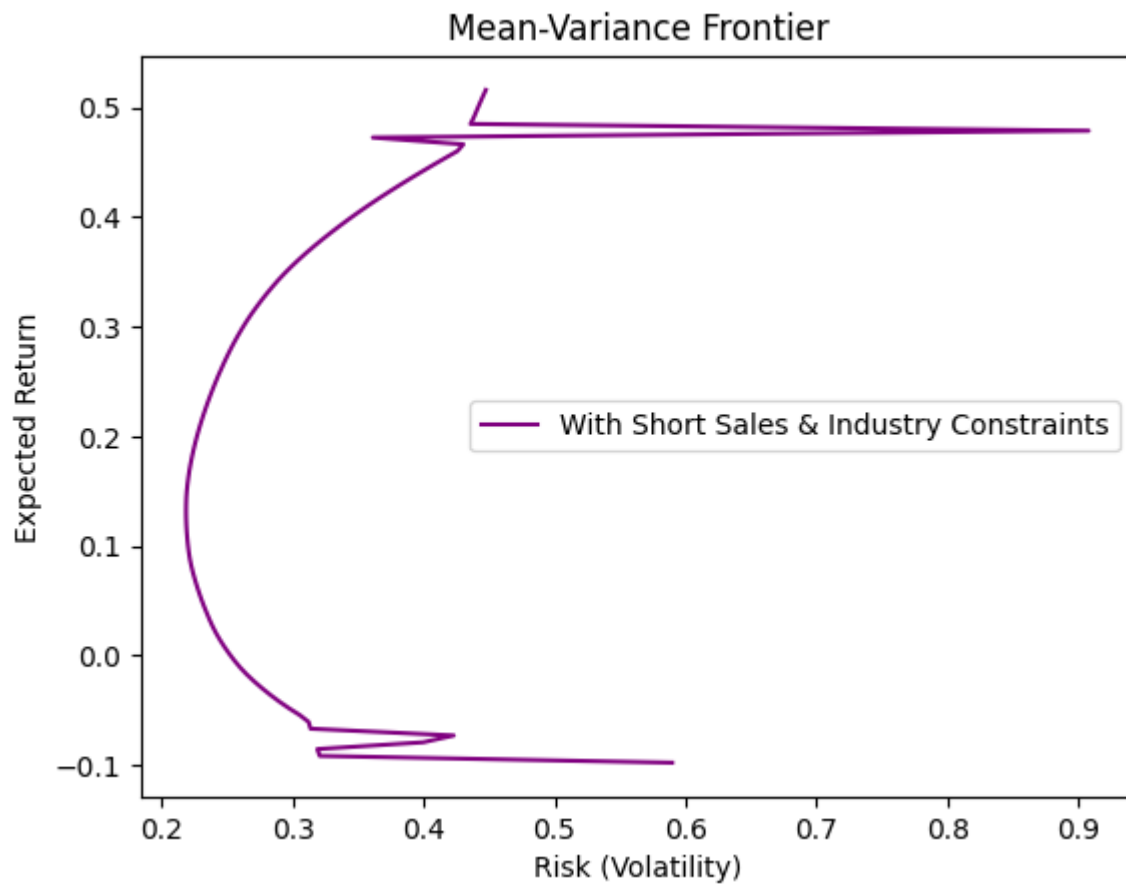
3. It is assumed that the constraint exists where weights per industry cannot be larger than 0.2.



4. Now with short sales constraints:

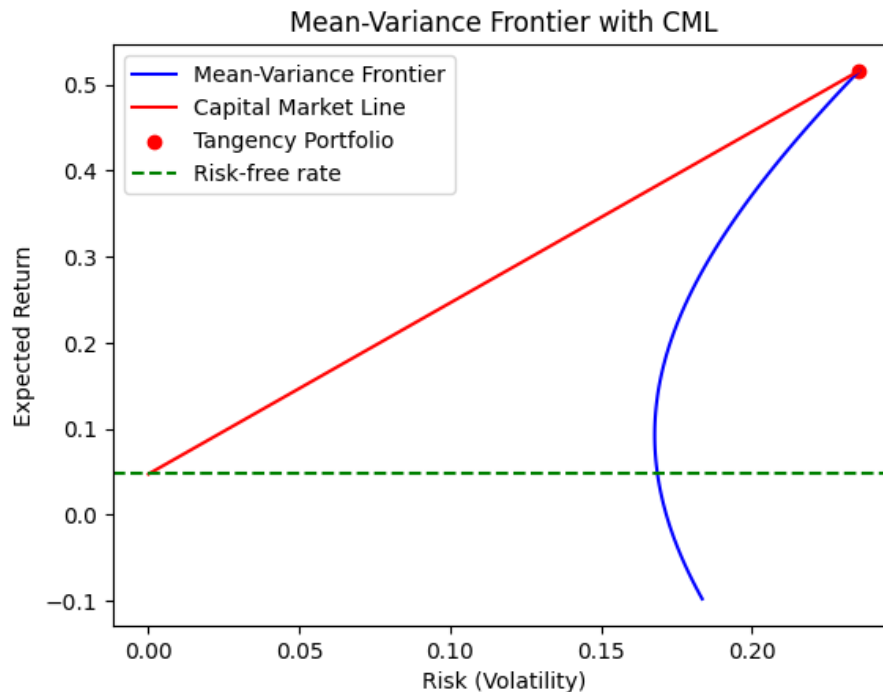


5. Ultimately, short sales constraints are in place, and the cumulative weights from the Information Technology industry must represent a minimum of 70% of the efficient portfolios.

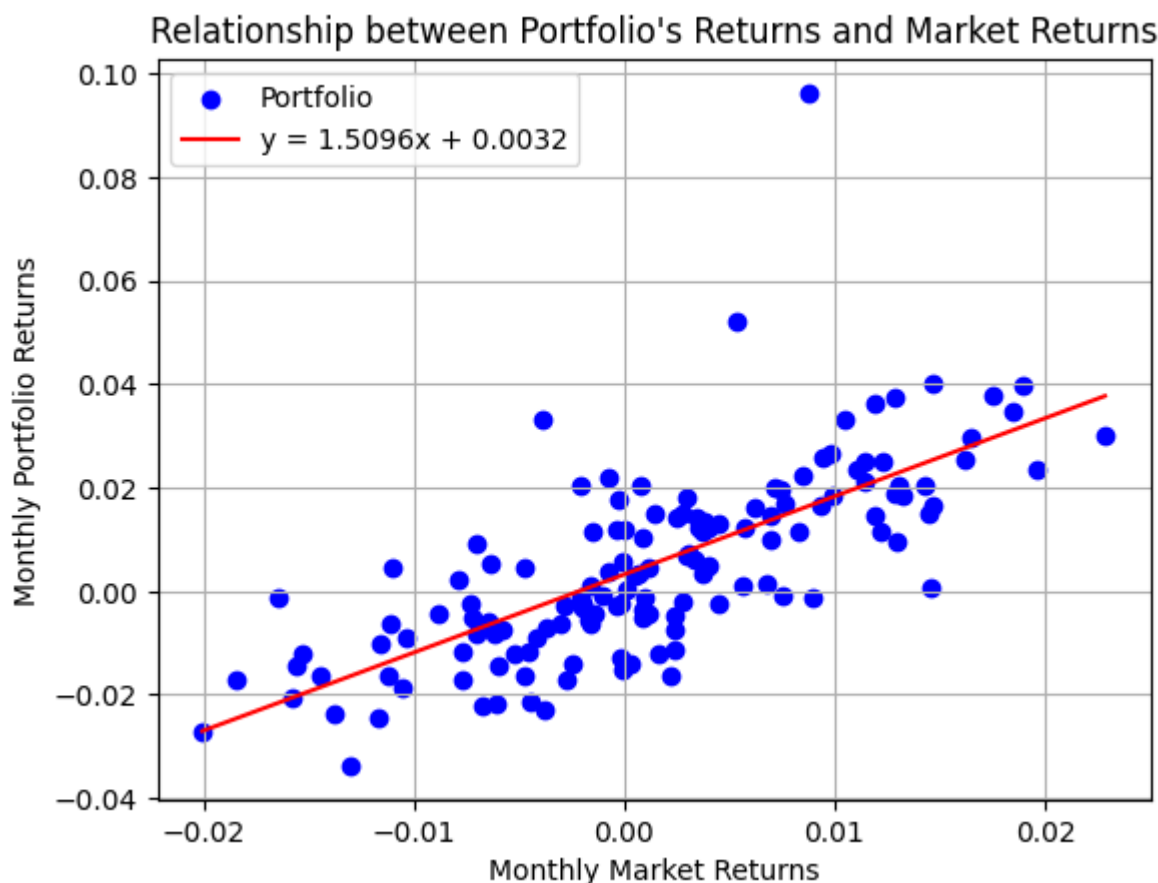


Question 1B: Mean-Variance Frontier

1. For risk free rate it is used 4.73% (Market yield on U.S. Treasury securities at 1-year constant maturity, quoted on investment basis) at 2022-12-30 given that there is no information about the rate on December 31st nor the 1st of January 2023.



2. S&P 500 Index - Mean Return: 9.49%, Volatility: 21.87% Market Portfolio - Mean Return: 12.86%, Volatility: 1.39% T-test comparing the mean returns of the market portfolio and the S&P 500 index: T-statistic: -0.14, P-value: 0.8885 The difference in mean returns between the market portfolio and the S&P 500 index is not statistically significant.
3. Now calculating the CAPM for 3 stocks
AAPL:
Alpha (α): 0.0007
Beta (β): 1.2276
MSFT:
Alpha (α): 0.0006
Beta (β): 1.2149
NVDA:
Alpha (α): 0.0009
Beta (β): 1.7281
4. In an attempt to mimic slide 37, the following information was calculated:



Question 2: Trading

We used the platform Interactive Brokers due to the advanced platform it gives us access to. After a couple iterations and days of gathering information we choose this scenario where we bought and sold LMT, treasury bonds and technology company Apple

Razonamiento detrás de las Acciones escogidas

Para tomar decisiones acertadas en el mercado de acciones se requiere de un análisis cuidadoso, es un proceso complejo dónde a través de análisis y la comprensión de diferentes y diversas variables económicas y financieras. En este ensayo explicaré el razonamiento detrás de mi elección de inversiones en acciones, destacando mi proceso de toma de decisiones, la diversificación de mi cartera y la gestión del riesgo.

Si bien la tarea entregada especificaba que había que invertir en solo tres acciones, decidimos invertir en cuatro a modo de diversificación en el caso de que nos fallara alguna de estas propuestas, pues éramos muy conscientes de que cada una de estas presentaba una apuesta a futuro y que la correcta elección de cada una de ellas nos conduciría a generar las ganancias esperadas, pero, igualmente esta toma de decisiones podría significar pérdidas indistintamente notables. Esta operación se llevó a cabo durante toda la semana del 16 de Octubre.

Para todos los Assets se compraron 80 acciones, dividiéndolas en 2. 40 acciones a precio de mercado, y las otras 40 al precio del Limit Buy. Lo mismo con la venta, se vendieron 40 acciones al precio del mercado y 40 al precio del Limit Sell.

Se ocuparon varias noticias de la página de Investing.com para guiarse en las decisiones tomadas, sin embargo, estas decisiones (la mayoría) no fueron acertadas. En el caso de Netflix, a pesar de tener mucha competencia y últimamente ciertos problemas por la inhabilitación de cuentas compartidas fuera de los hogares y las huelgas de los escritores se decía que sus acciones podrían igualmente subir. (Investing.com, 2023)



Tesla Inc. (TSLA)

\$211.99 ▼ -8.12 (-3.69%) _r

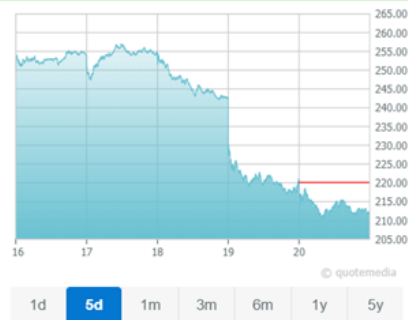
Bid: 212.75 x 700 Ask: 212.76 x 200

October 20, 2023 4:00 PM ET Volume: 138,010,095

After Hours: \$212.75 0.76 (0.36%) October 20, 2023 7:59 PM ET Volume: 1,087,909

USD | NASDAQ GLOBAL SELECT | DELAYED PRICE | MARKET CLOSED

Detailed Quote



Last	211.99	Volume	138.01m
\$ Chg	-8.12	% Chg	-3.69%
Open	217.01	Prev. Close	220.11
High	218.86	Low	210.42
Bid	212.75	Ask	212.76
Bid Size	700	Ask Size	200
Beta	2.07704	VWAP	213.92263
Year High	<u>299.29</u>	Year Low	<u>101.81</u>
Market Cap	672.86b	Total Shares	3.17b
PB Ratio	13.159	Shares Out	3.17b
EPS	0.32	PE Ratio	55.66
		Exchange	NGS

General Motors Company (GM)

\$29.66 ▲ 0.33 (1.13%)

Bid: 29.70 x 100 Ask: 29.84 x 1600

October 20, 2023 4:00 PM ET Volume: 21,643,505

After Hours: \$29.83 0.17 (0.57%) October 20, 2023 7:59 PM ET Volume: 638,220

USD | NEW YORK STOCK EXCHANGE | DELAYED PRICE | MARKET CLOSED

Detailed Quote



Last	29.66	Volume	21.64m
\$ Chg	0.33	% Chg	1.13%
Open	29.88	Prev. Close	29.33
High	30.245	Low	29.45
Bid	29.70	Ask	29.84
Bid Size	100	Ask Size	1600
Beta	1.37988	VWAP	29.73501
Year High	<u>43.63</u>	Year Low	<u>29.06</u>
Dividend	0.09 USD	Yield	1.214
Div. Pay D...	2023-09-14	Ex-Div Date	2023-08-31
Div. Freq.	Q	Total Shares	1.38b
Market Cap	40.81b	Shares Out	1.38b
PB Ratio	0.57	PE Ratio	3.98
EPS	7.16	Exchange	NYSE

Bibliografía

Investing.com. (16 de Octubre de 2023). *Investing.com*. Obtenido de <https://es.investing.com/news/stock-market-news/netflix-podria-subir-precios-tras-exito-de-campana-contra-uso-compartido-de-contrasenas-2471899>

Appendix

1. Volatility and returns of the selected stocks

Ticker	Expected_Return	Volatility	Industry
AAPL	0.3195	0.335	Information Technology
NVDA	0.4202	0.5189	Information Technology
AMD	0.6745	0.5682	Information Technology
V	0.1764	0.2942	Information Technology
MSFT	0.2888	0.3106	Information Technology
INTC	-0.0414	0.3791	Information Technology
CSCO	0.0875	0.2926	Information Technology
NEE	0.21	0.271	Utilities
DUK	0.0743	0.241	Utilities
D	-0.0189	0.2638	Utilities
SO	0.1245	0.2628	Utilities
EXC	0.1325	0.28	Utilities
AEP	0.0858	0.2366	Utilities
PPL	0.0295	0.276	Utilities
AMT	0.1303	0.287	Real Estate
SPG	0.0373	0.4748	Real Estate
PLD	0.1717	0.2994	Real Estate
WELL	0.0885	0.3991	Real Estate
EQR	0.0287	0.2933	Real Estate
AVB	0.0239	0.2898	Real Estate
O	0.0831	0.3127	Real Estate

BA	0.0416	0.5089	Industrials
MMM	-0.0933	0.2725	Industrials
HON	0.1187	0.2725	Industrials
UNP	0.1342	0.2872	Industrials
CAT	0.1509	0.3337	Industrials
LMT	0.1293	0.2703	Industrials
JNJ	0.0721	0.2093	Health Care
PFE	0.12	0.2633	Health Care
MRK	0.1885	0.2329	Health Care
ABT	0.1747	0.268	Health Care
AMGN	0.1188	0.2585	Health Care
LLY	0.4013	0.3	Health Care
JPM	0.0995	0.3213	Financials
BAC	0.0868	0.3551	Financials
WFC	-0.0082	0.3743	Financials
C	-0.0238	0.3881	Financials
GS	0.1204	0.3309	Financials
MS	0.1739	0.3551	Financials
USB	0.013	0.3344	Financials