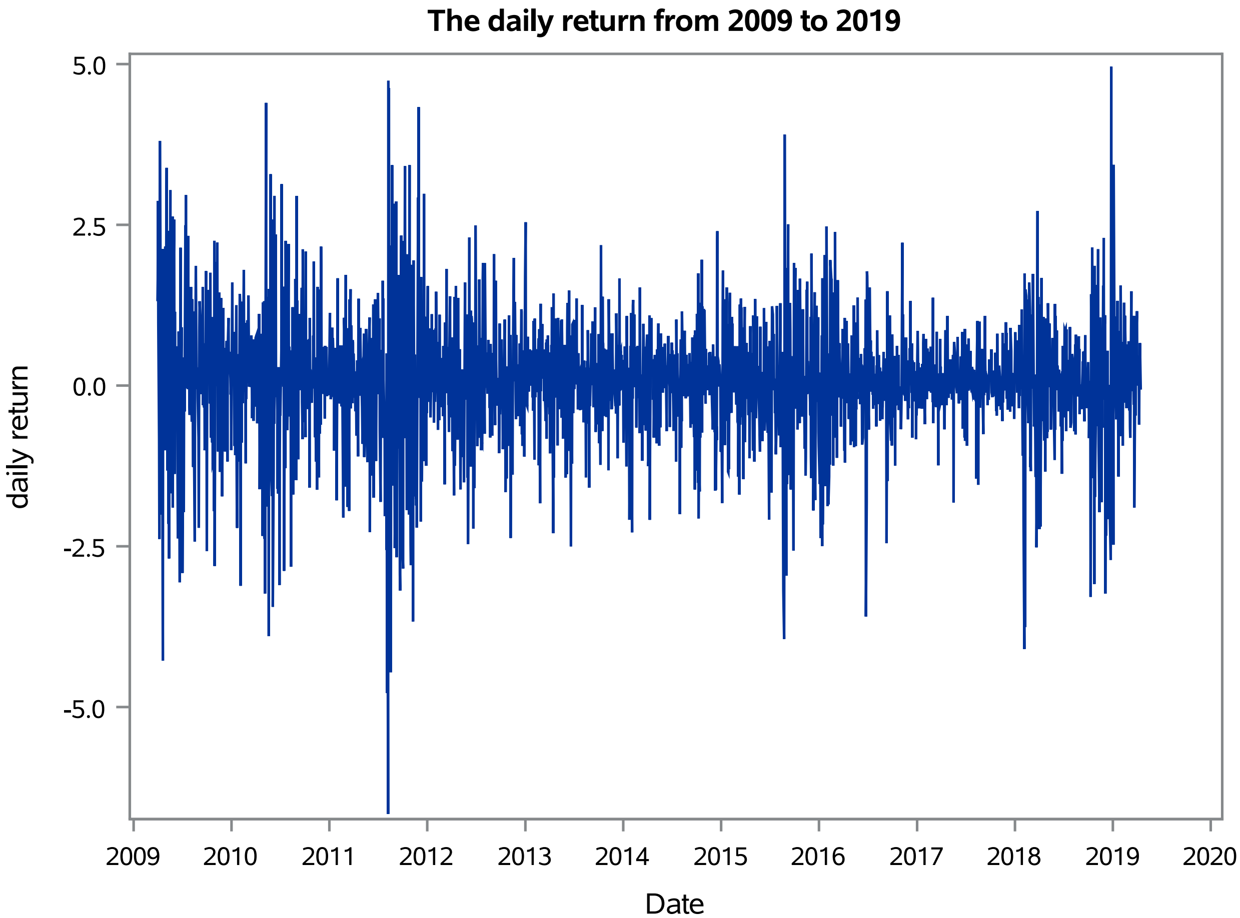
The count and percentage of sectors in SP 500 Index

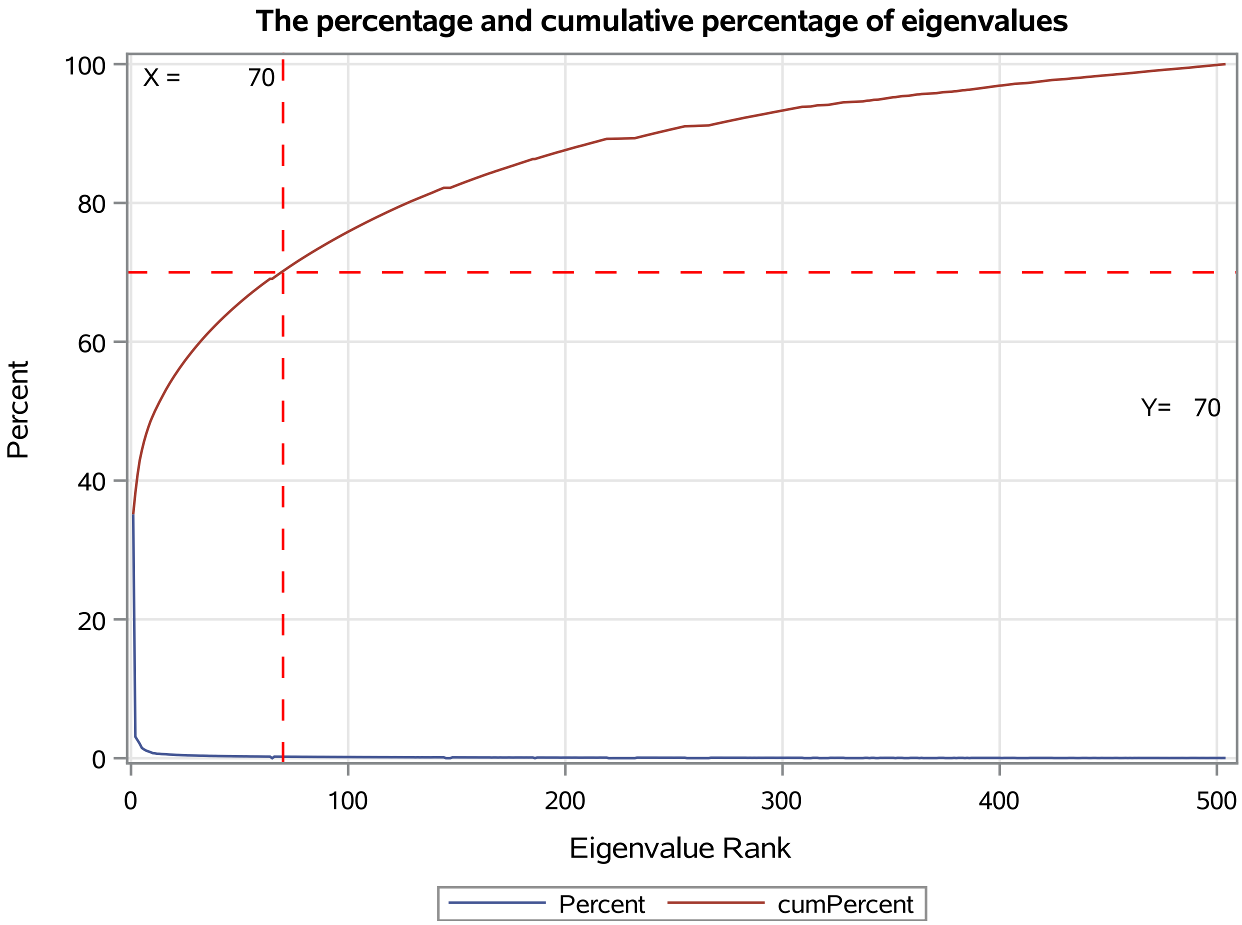
Sector	N	Percentage
Industrials	70	13.9%
Information Technology	68	13.5%
Financials	67	13.3%
Consumer Discretionary	64	12.7%
Health Care	62	12.3%
Consumer Staples	32	6.3%
Real Estate	32	6.3%
Energy	29	5.8%
Utilities	28	5.6%
Materials	26	5.2%
Communication Services	26	5.2%



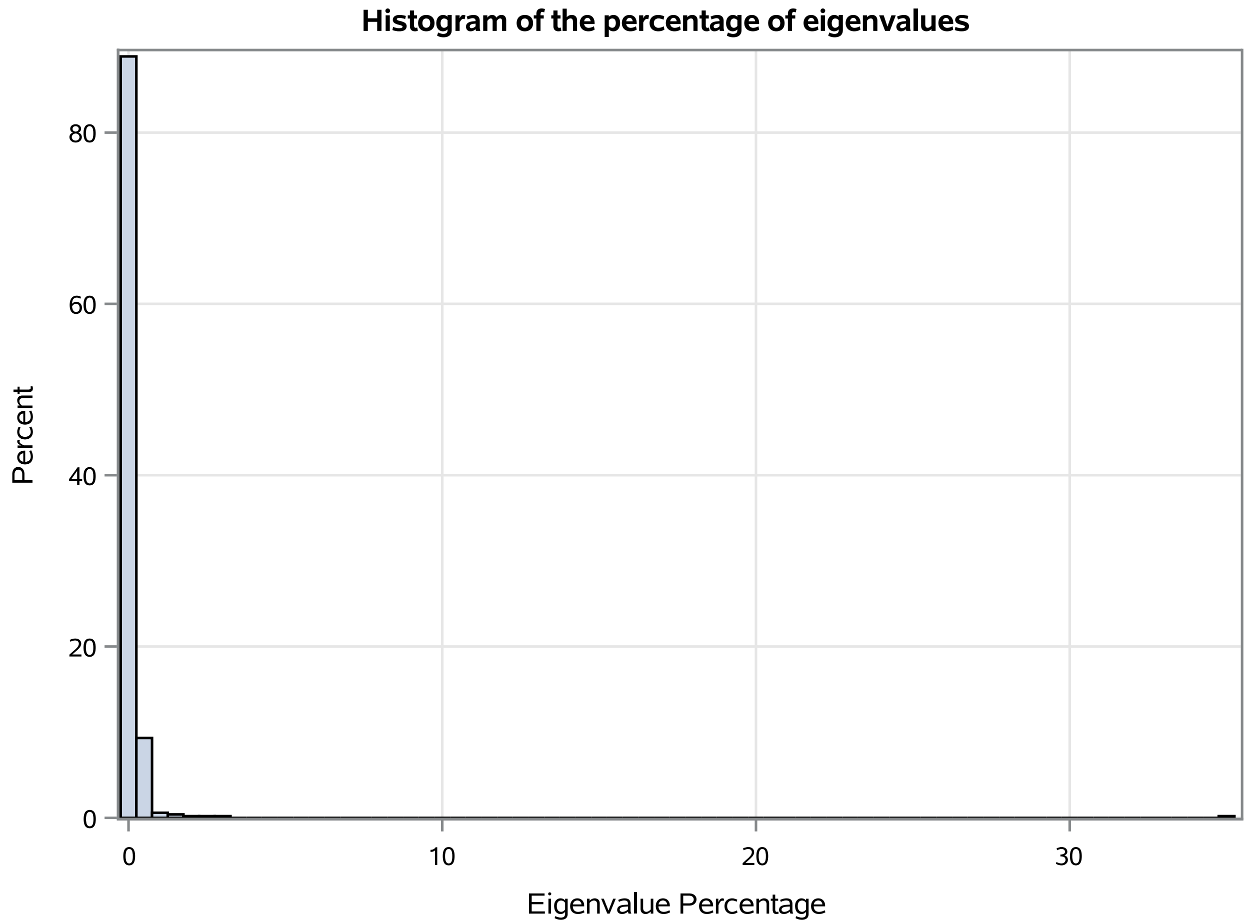
The daily return from 2009 to 2019
5.0
2.5
0.0
-2.5
-5.0
daily return
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Date

Eigenvalues and percentages of first 5 eigenvalues

Rank	eigenvalue	Percentage	Cumulative Percentage
1	578.42	35.147	35.147
2	50.80	3.0867	38.234
3	42.63	2.5902	40.824
4	34.26	2.0815	42.906
5	24.28	1.4752	44.381

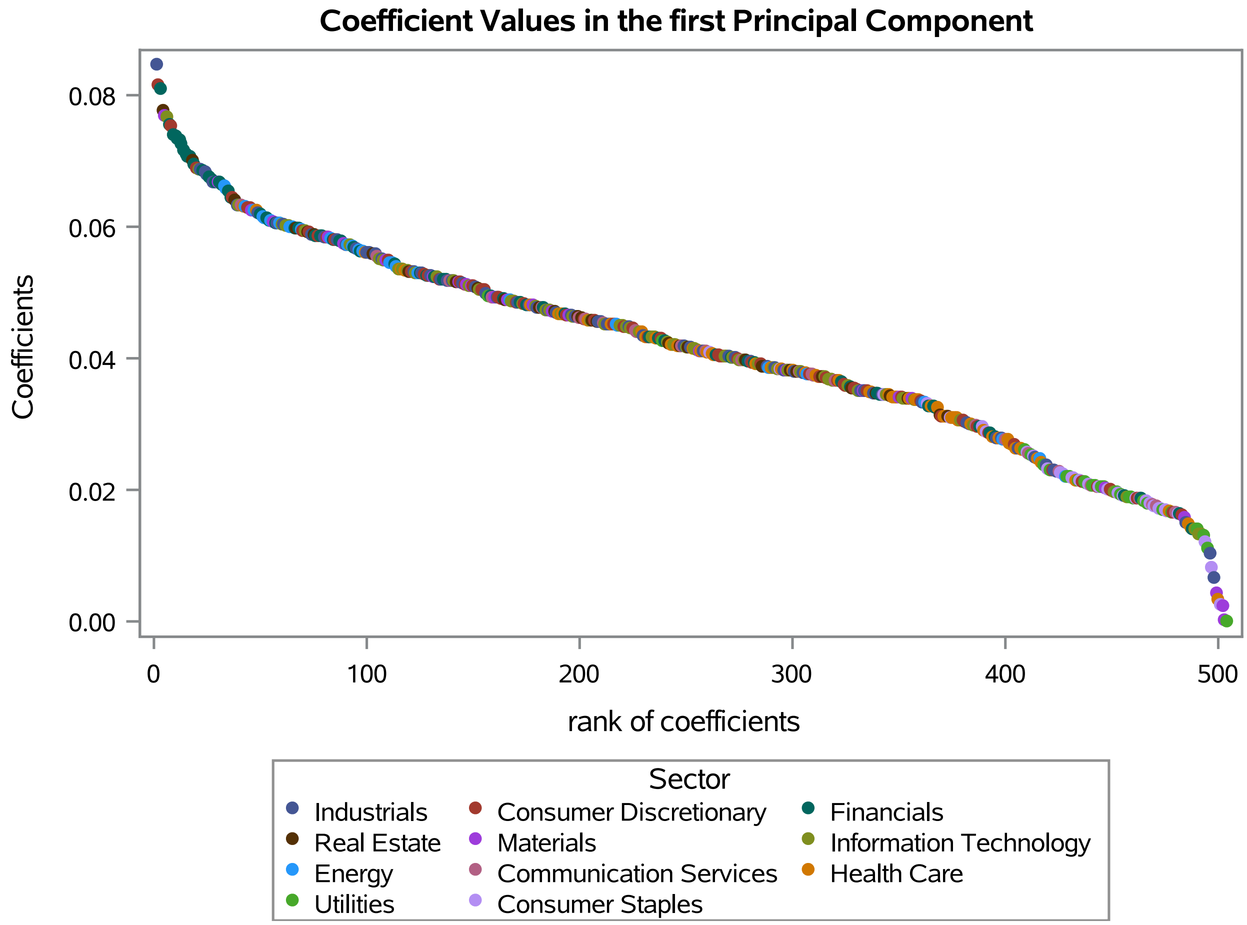


The percentage and cumulative percentage of eigenvalues
X = 70
Y= 70
Percent
Eigenvalue Rank
0
20
40
60
80
100
0
100
200
300
400
500
Percent
cumPercent

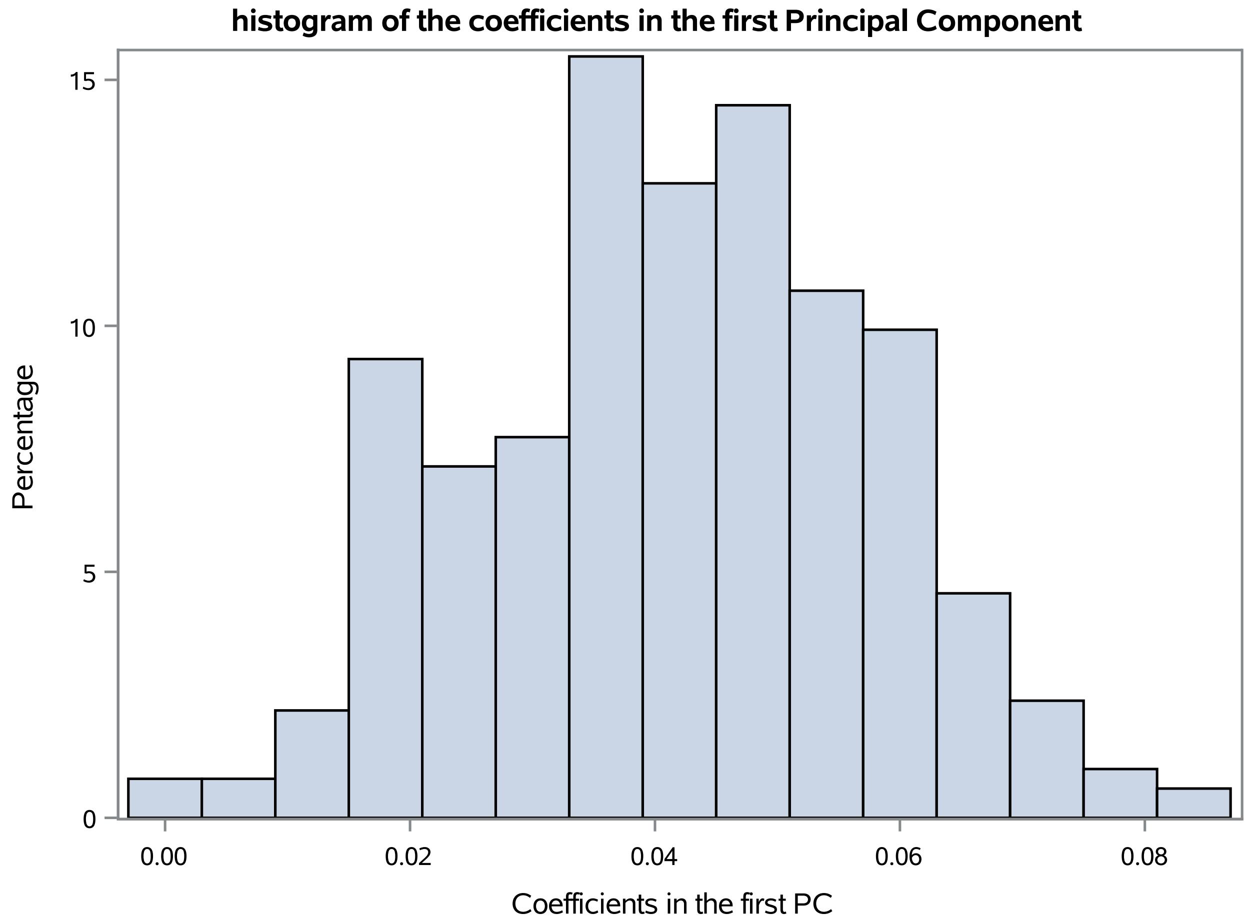

Histogram of the percentage of eigenvalues
Percent
80
60
40
20
0
0
10
20
30
Eigenvalue Percentage

Summary Table of the percentage eigenvalues

Analysis Variable : Percent				
N	Mean	Std Dev	Minimum	Maximum
504	0.1984127	1.5794137	-2.12612E-16	35.1472497



Coefficient Values in the first Principal Component
0.08
0.06
0.04
0.02
0.00
Coefficients
0
100
200
300
400
500
rank of coefficients
Sector
Industrials
Consumer Discretionary
Financials
Real Estate
Materials
Information Technology
Energy
Communication Services
Health Care
Utilities
Consumer Staples

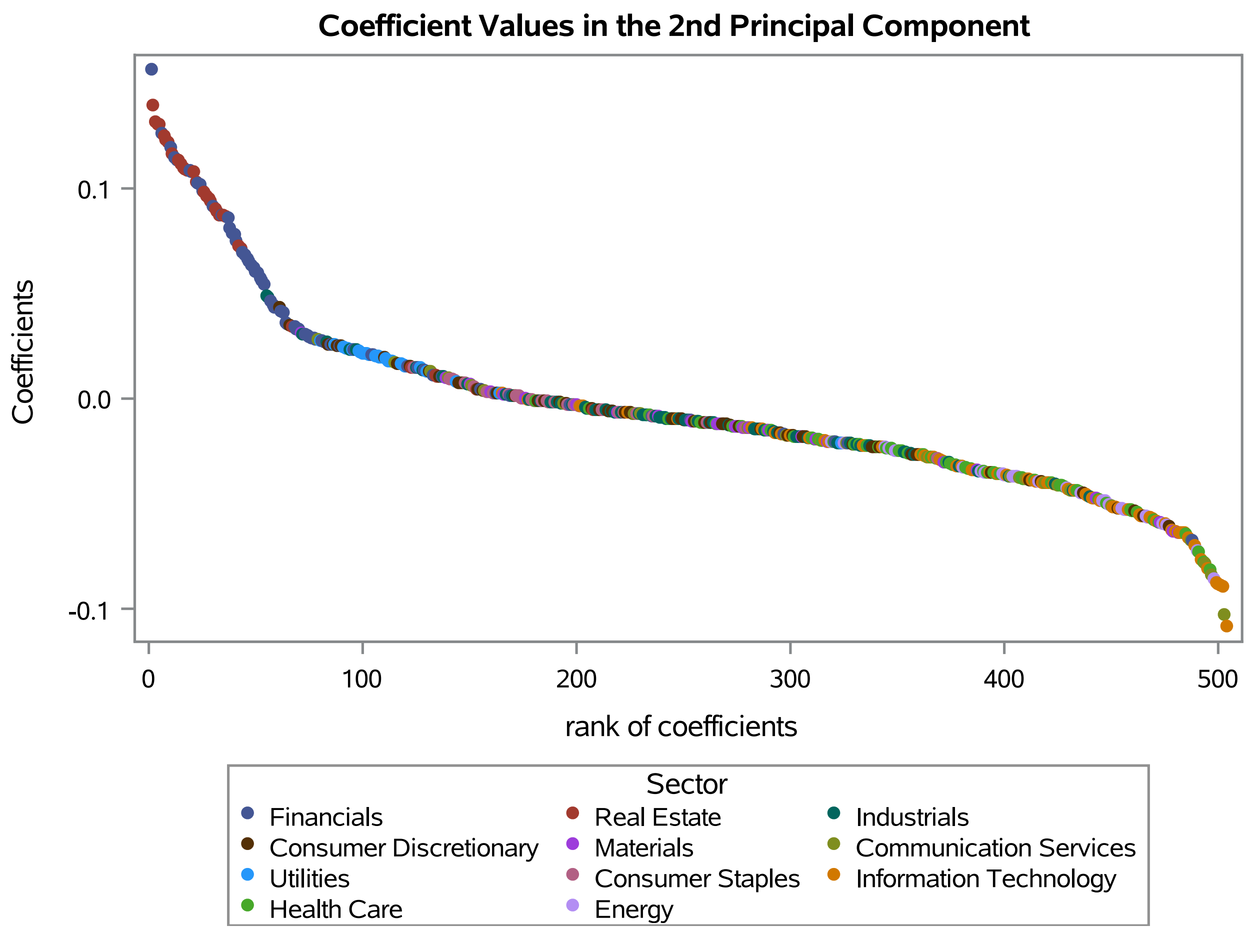

histogram of the coefficients in the first Principal Component
15
10
5
0
Percentage
0.00
0.02
0.04
0.06
0.08
Coefficients in the first PC

Correlation of the daily return between PC1 and SP500

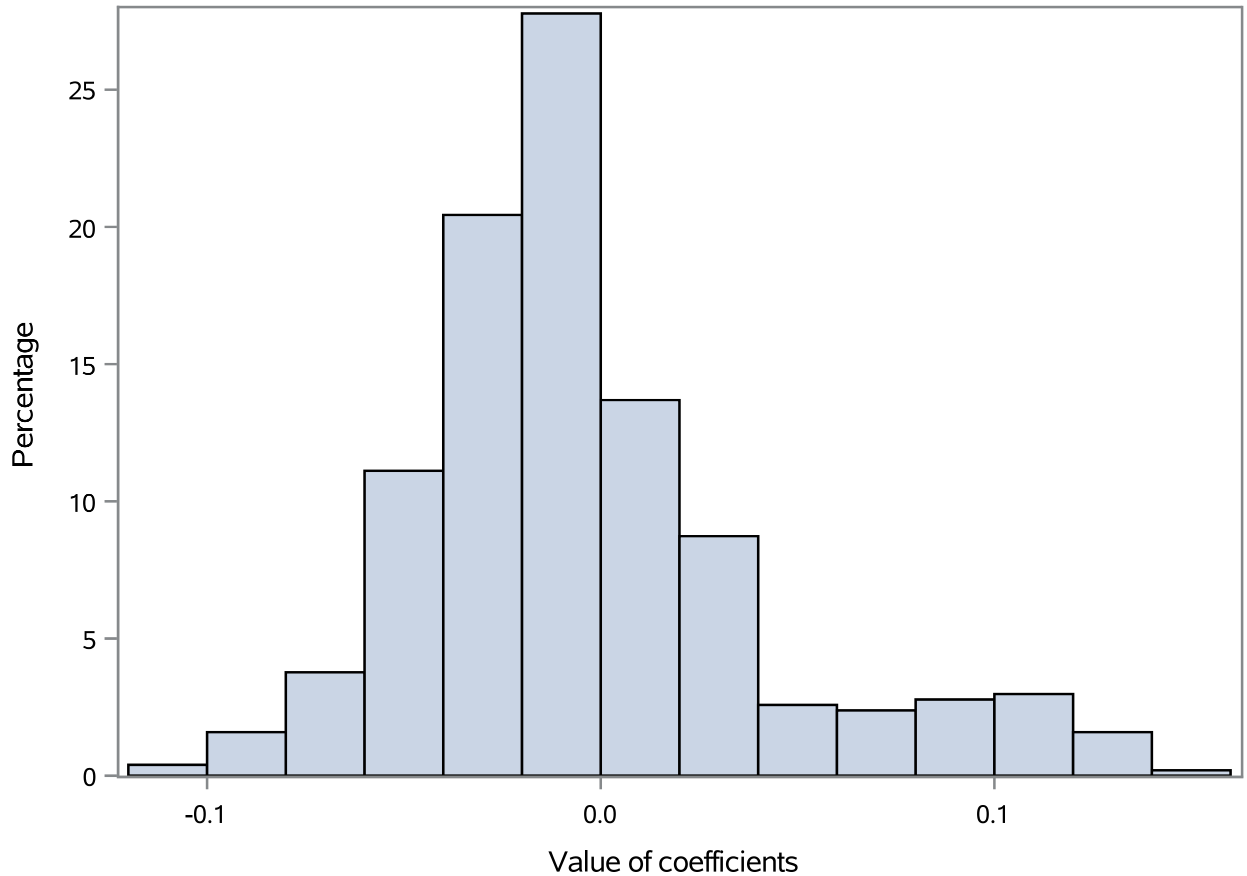
2 Variables:	Sp500 PC1

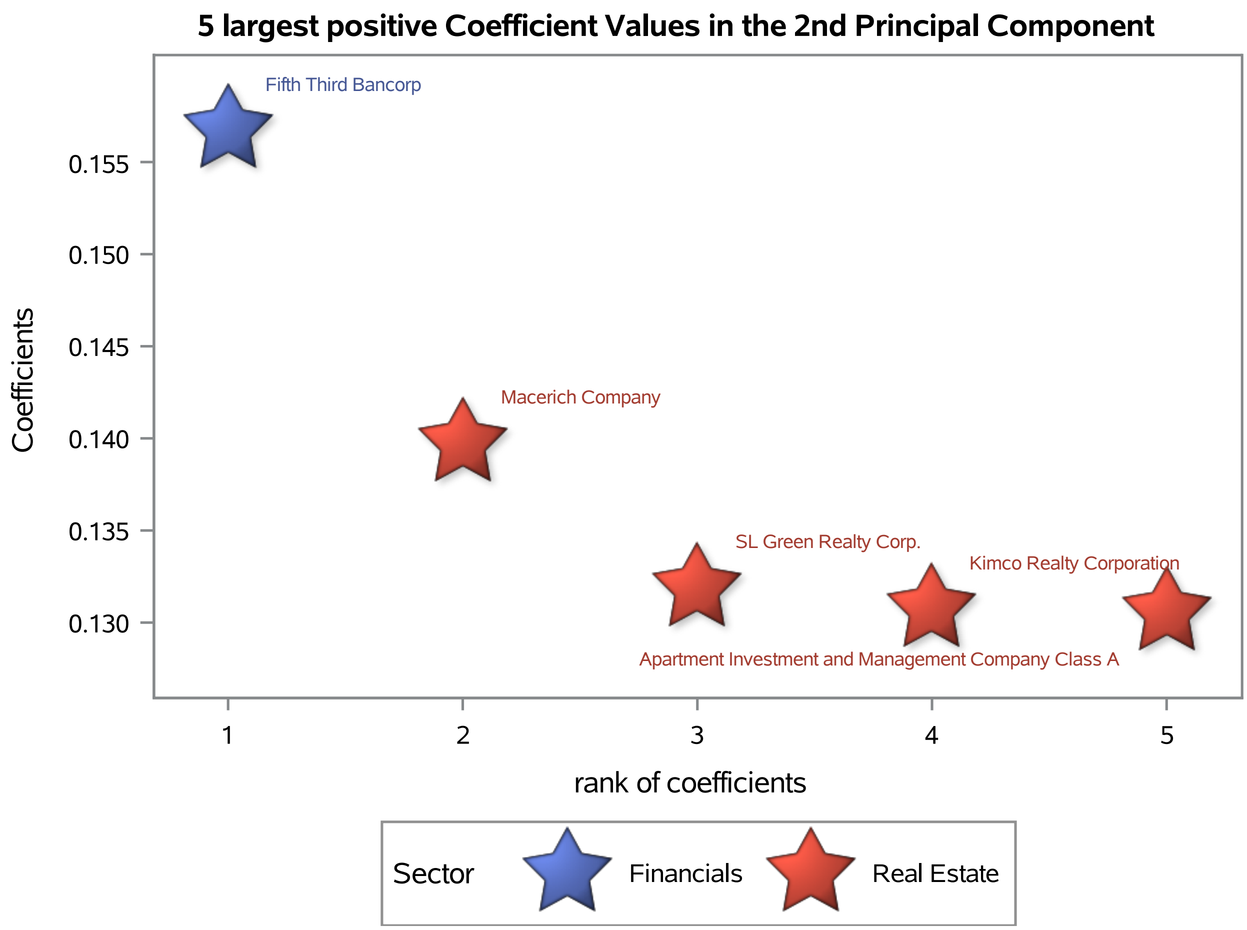
Simple Statistics						
Variable	**N**	**Mean**	**Std Dev**	**Sum**	**Minimum**	**Maximum**
Sp500	2528	0.05639	0.97231	142.55049	-6.66345	4.95937
PC1	2528	0.09136	1.25784	230.96273	-8.45449	8.26167

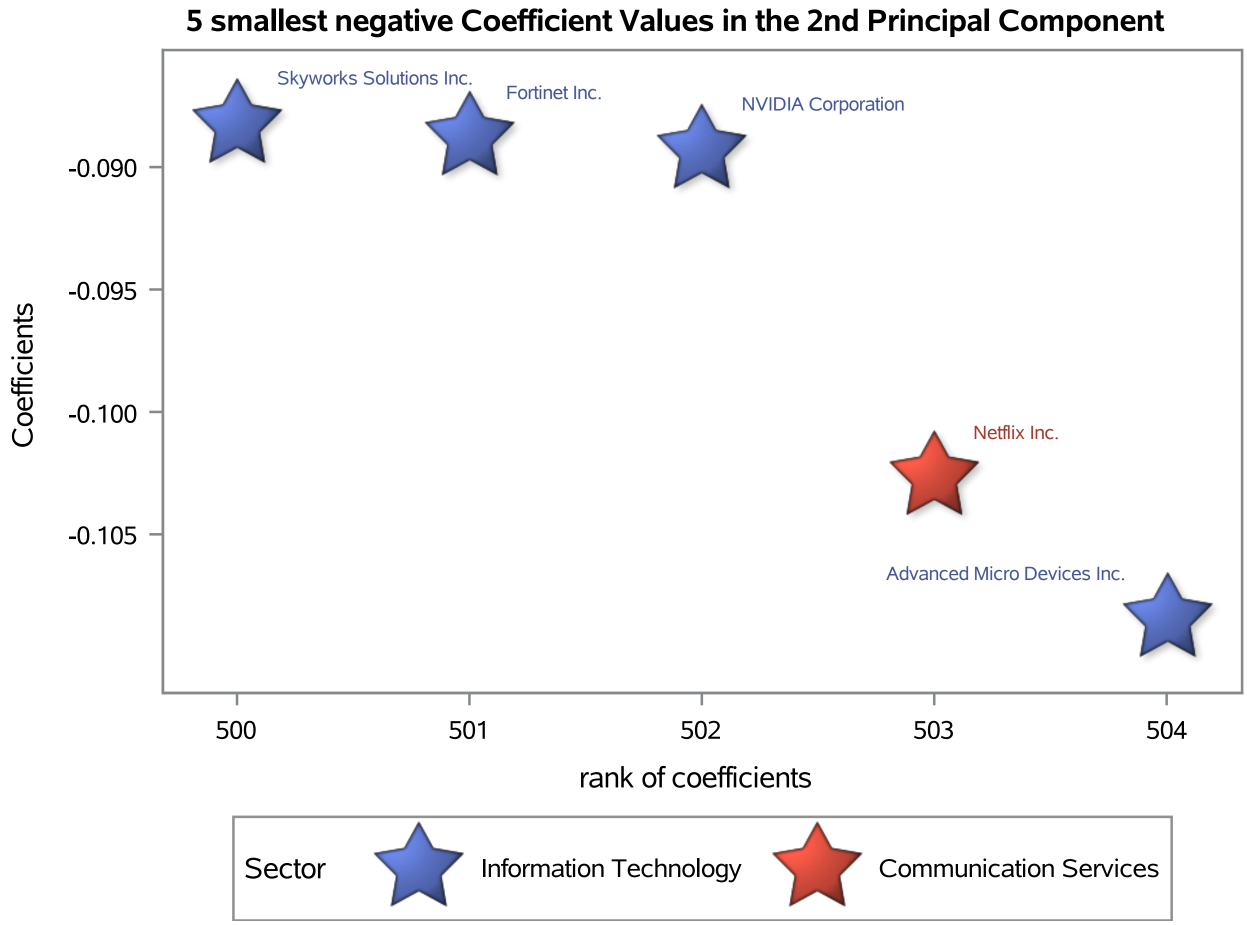
Pearson Correlation Coefficients, N = 2528 Prob > |r| under H0: Rho=0		
	Sp500	**PC1**
Sp500	1.00000	0.96606 <.0001
PC1	0.96606 <.0001	1.00000

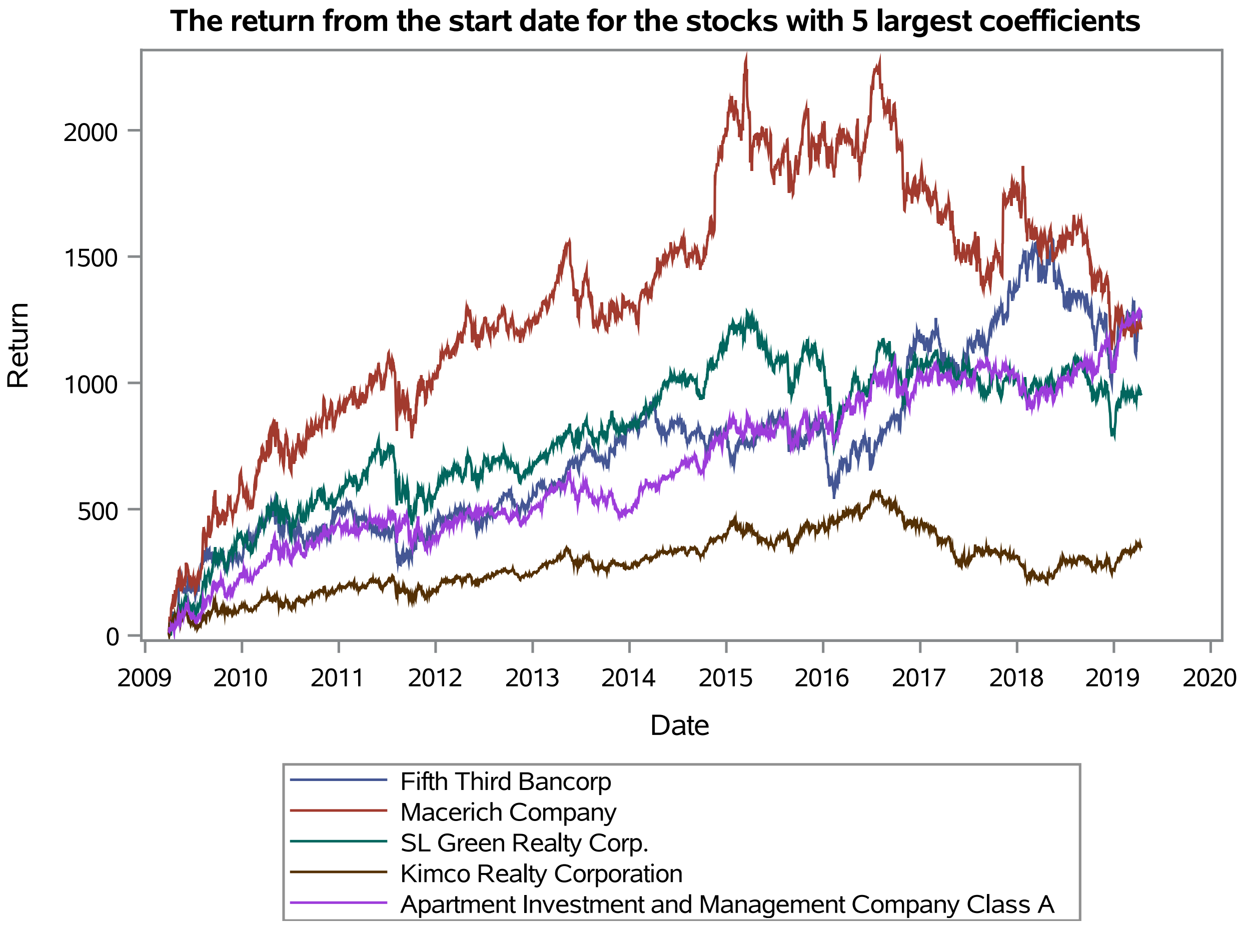

Coefficient Values in the 2nd Principal Component
Coefficients
0.1
0.0
-0.1
0
100
200
300
400
500
rank of coefficients
Sector
Financials
Real Estate
Industrials
Consumer Discretionary
Materials
Communication Services
Utilities
Consumer Staples
Information Technology
Health Care
Energy

Histogram of Coefficient Values in the 2nd Principal Component

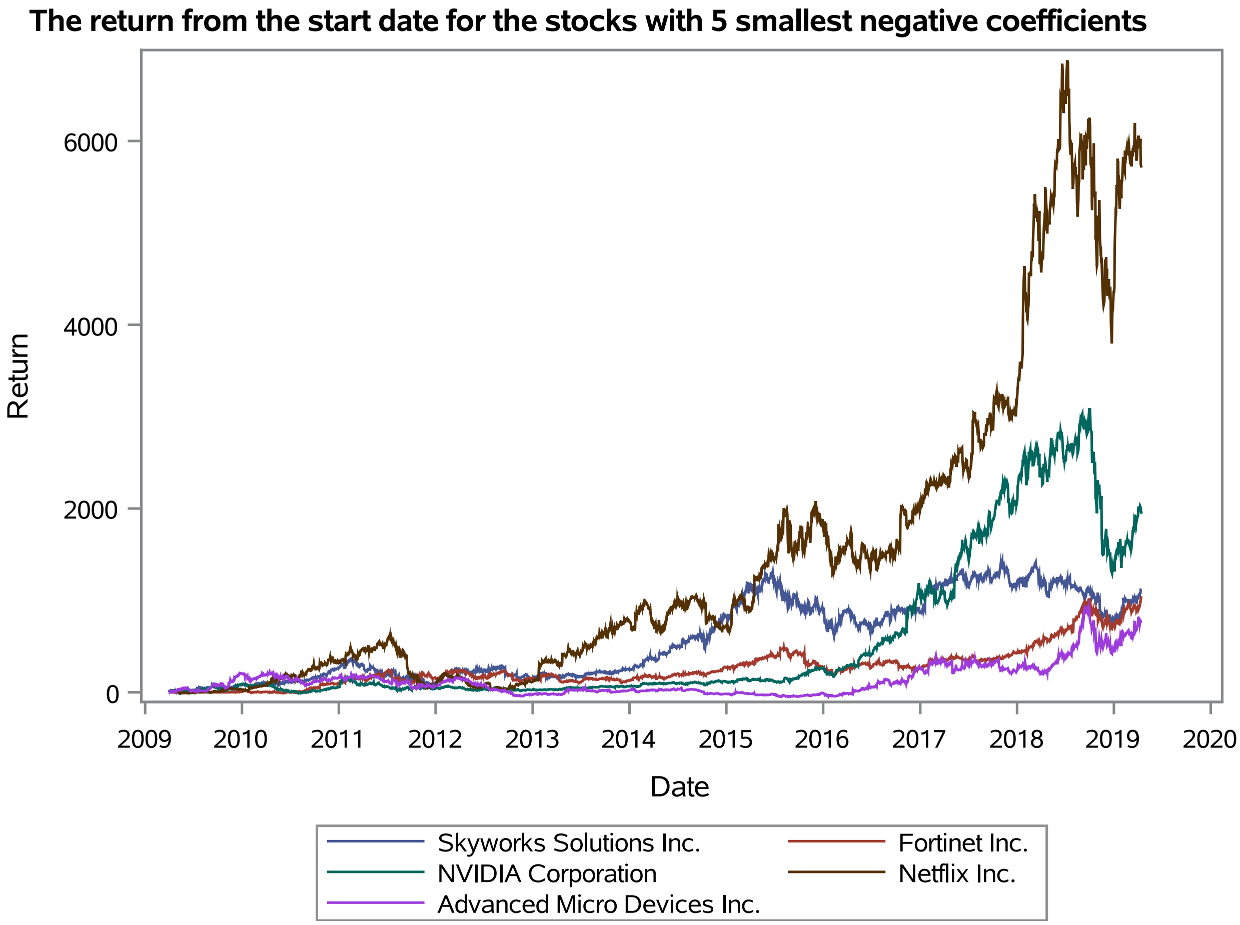



5 largest positive Coefficient Values in the 2nd Principal Component
Fifth Third Bancorp
Macerich Company
SL Green Realty Corp.
Kimco Realty Corporation
Apartment Investment and Management Company Class A
0.155
0.150
0.145
0.140
0.135
0.130
Coefficients
1
2
3
4
5
rank of coefficients
Sector
Financials
Real Estate

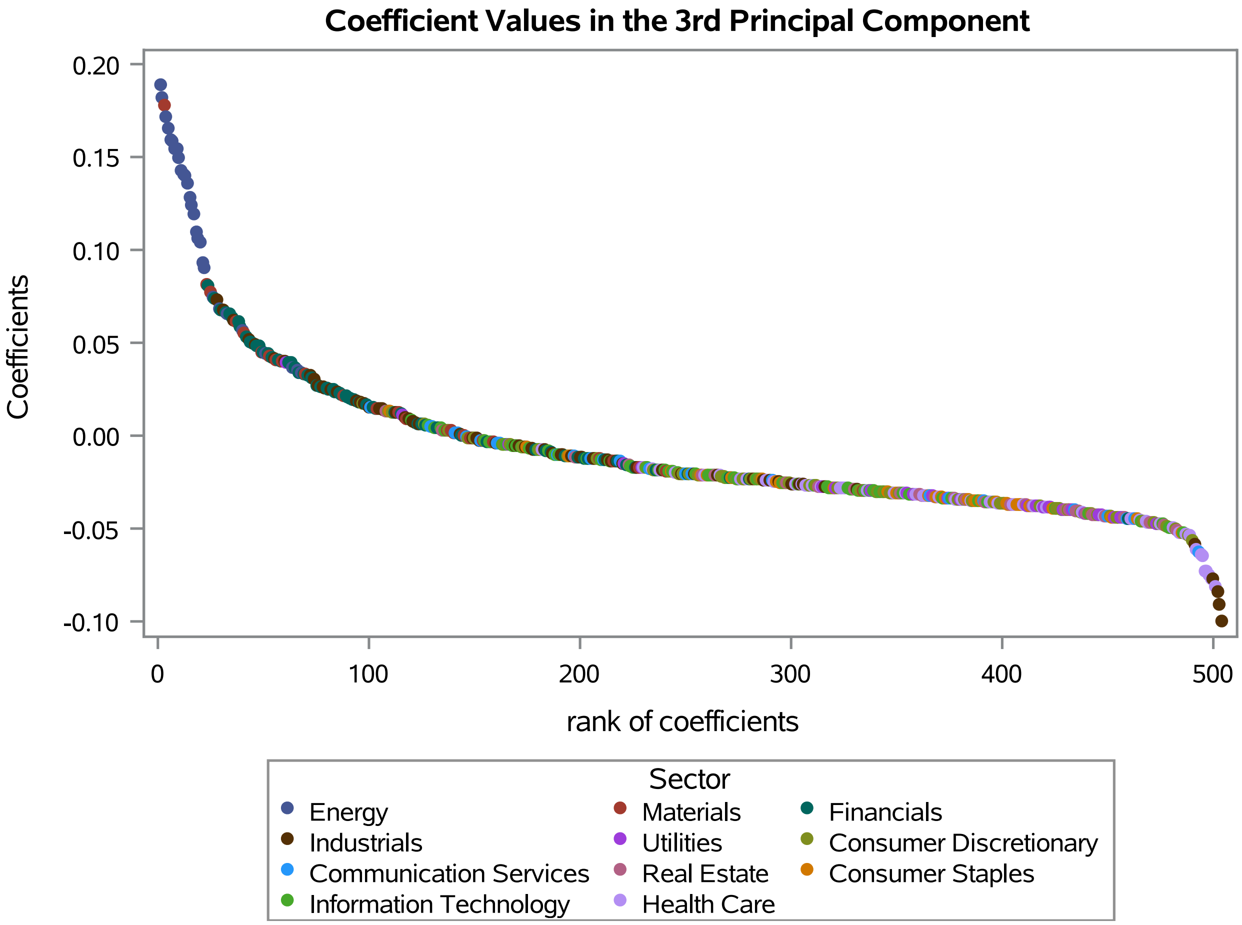

5 smallest negative Coefficient Values in the 2nd Principal Component
Skyworks Solutions Inc.
Fortinet Inc.
NVIDIA Corporation
Netflix Inc.
Advanced Micro Devices Inc.
-0.090
-0.095
-0.100
-0.105
Coefficients
500
501
502
503
504
rank of coefficients
Sector
Information Technology
Communication Services

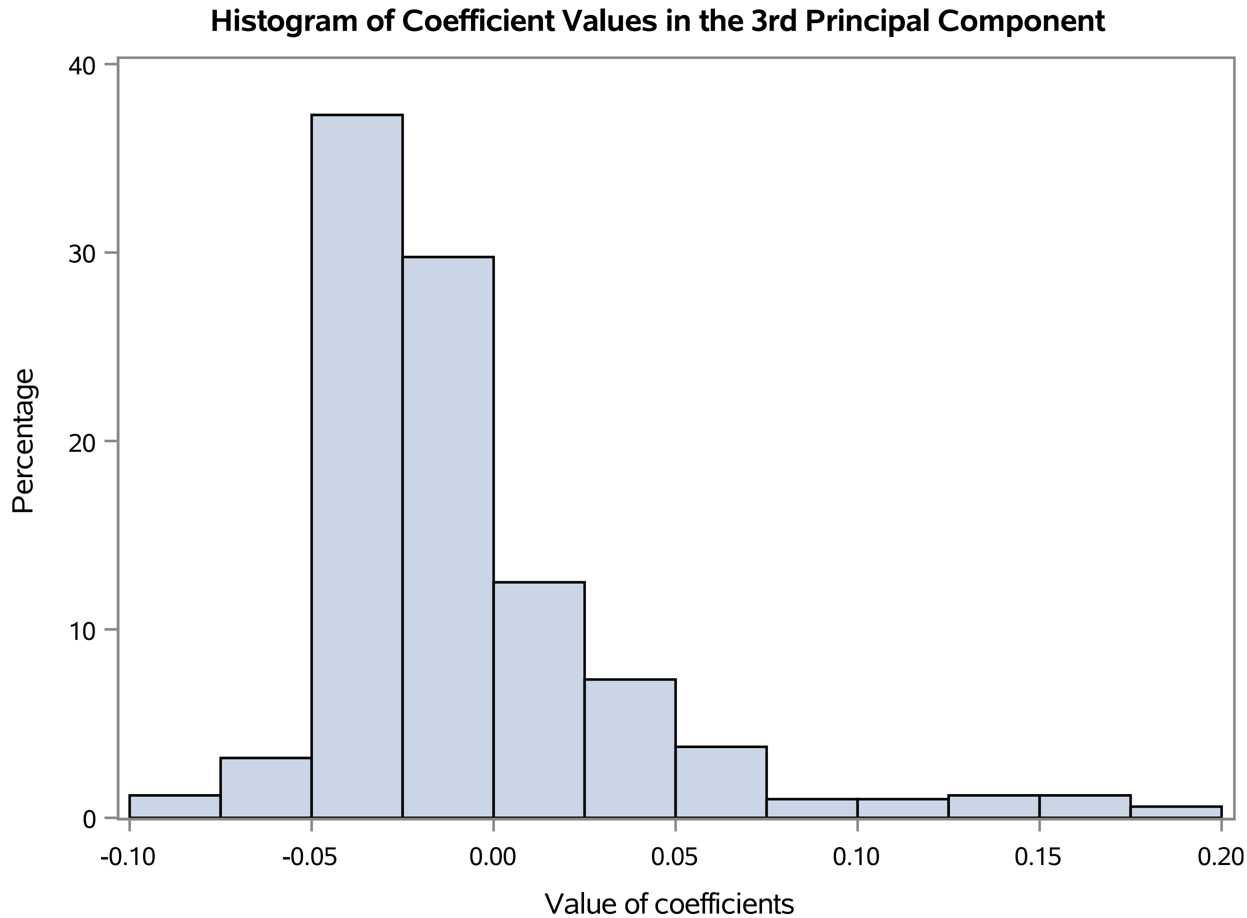


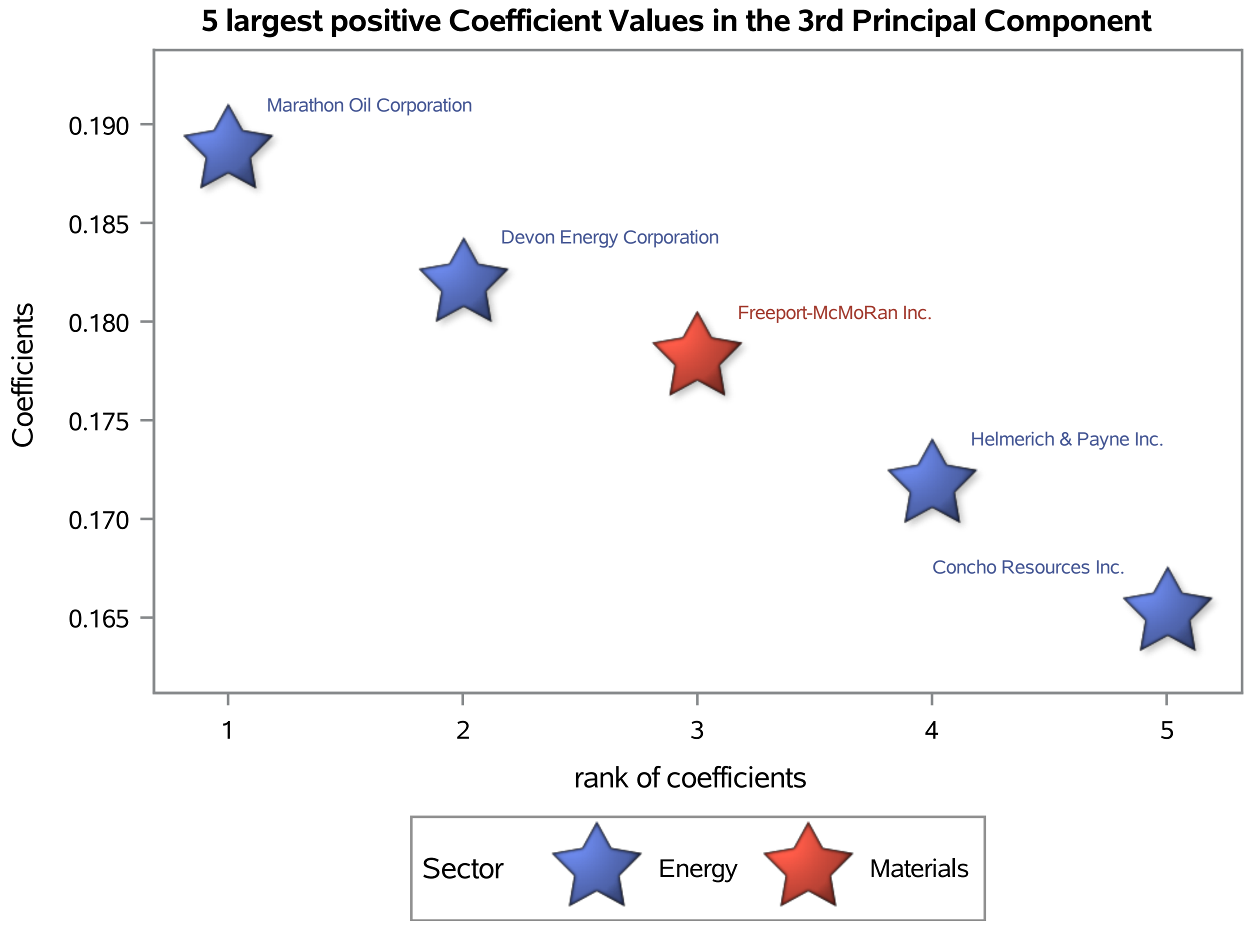
The return from the start date for the stocks with 5 largest coefficients
Return
0
500
1000
1500
2000
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Date
Fifth Third Bancorp
Macerich Company
SL Green Realty Corp.
Kimco Realty Corporation
Apartment Investment and Management Company Class A

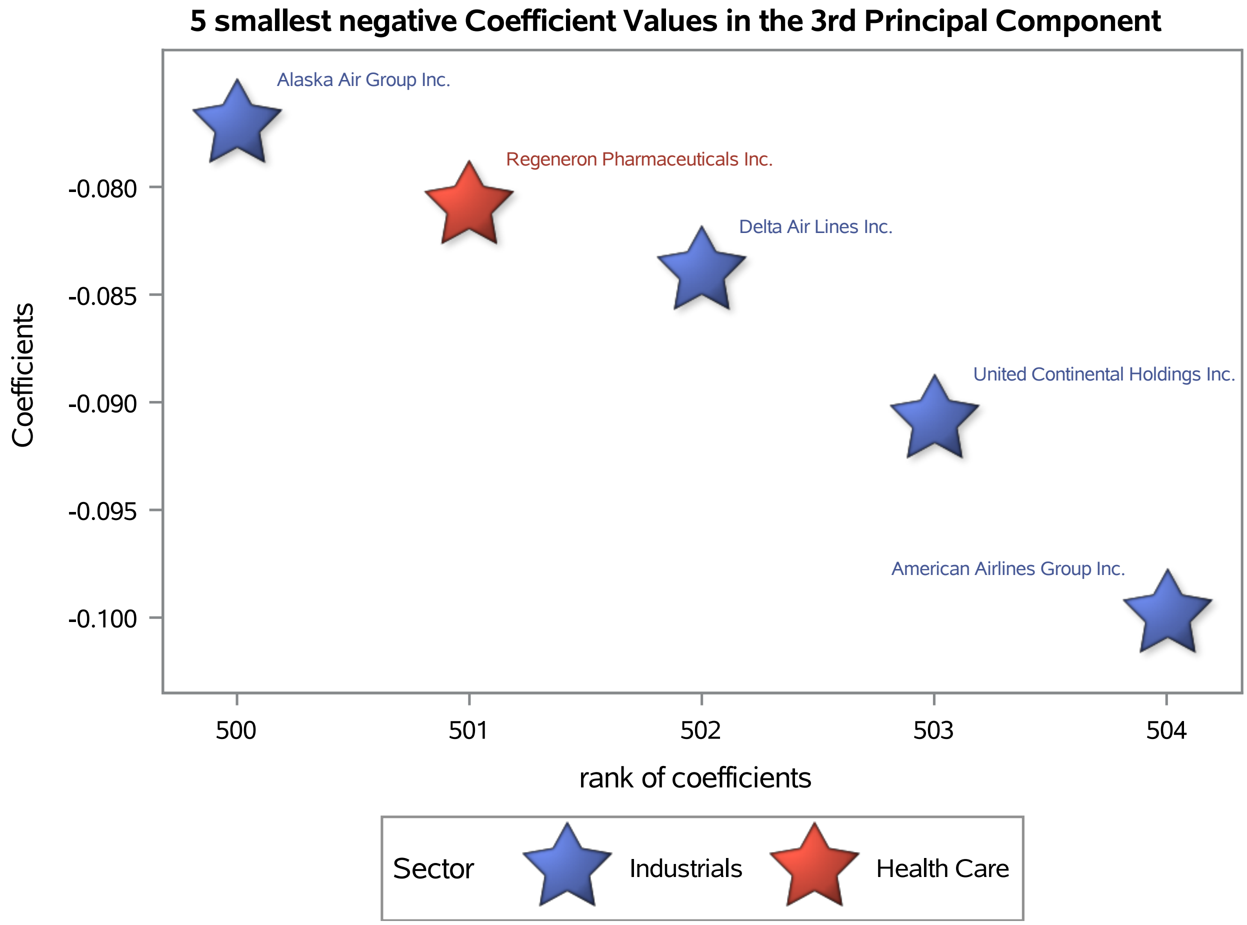


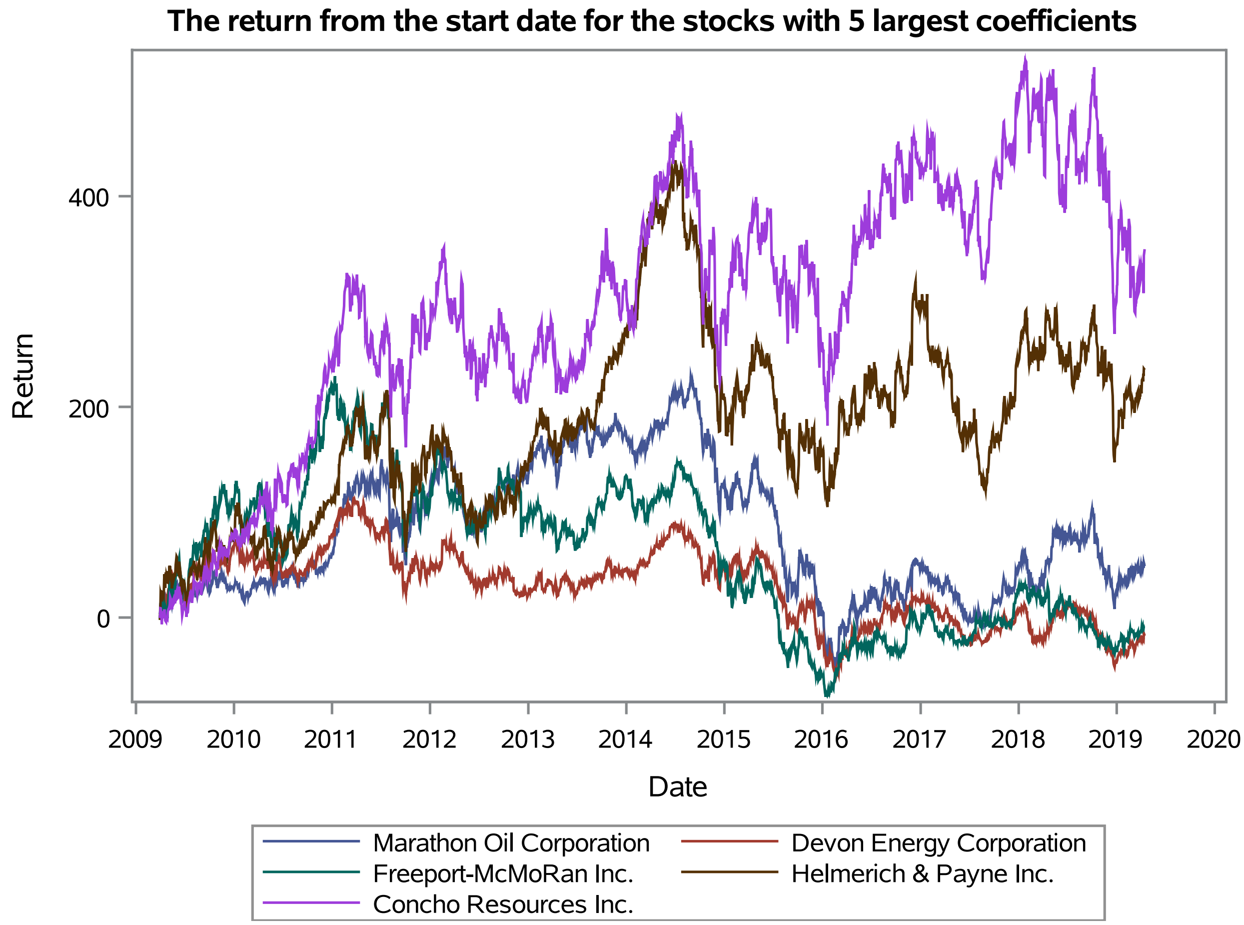
The return from the start date for the stocks with 5 smallest negative coefficients
Return
6000
4000
2000
0
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Date
Skyworks Solutions Inc.
Fortinet Inc.
NVIDIA Corporation
Netflix Inc.
Advanced Micro Devices Inc.

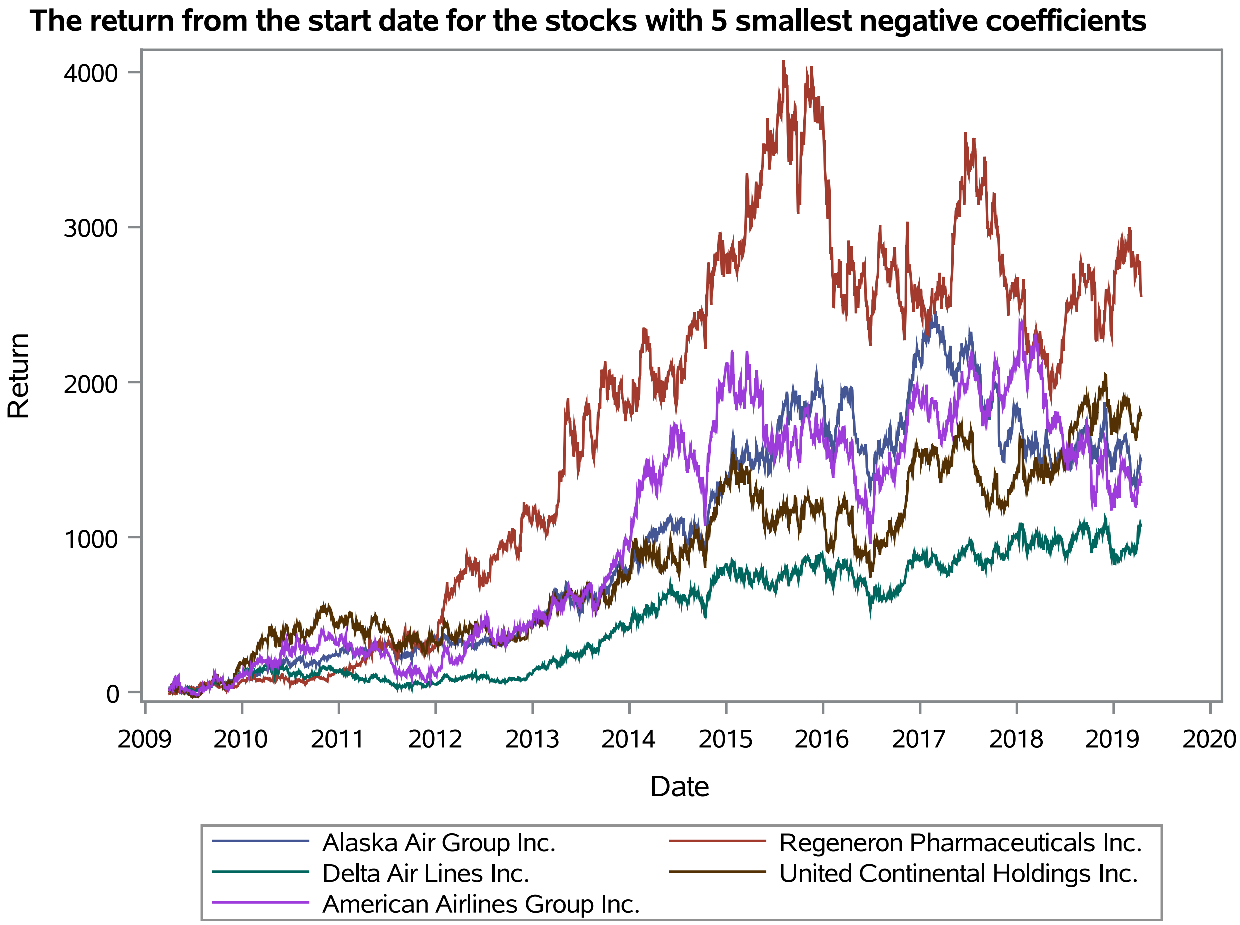

Coefficient Values in the 3rd Principal Component
0.20
0.15
0.10
0.05
0.00
-0.05
-0.10
Coefficients
0
100
200
300
400
500
rank of coefficients
Sector
Energy
Materials
Financials
Industrials
Utilities
Consumer Discretionary
Communication Services
Real Estate
Consumer Staples
Information Technology
Health Care


Histogram of Coefficient Values in the 3rd Principal Component
Percentage
40
30
20
10
0
-0.10
-0.05
0.00
0.05
0.10
0.15
0.20
Value of coefficients


5 largest positive Coefficient Values in the 3rd Principal Component
Coefficients
0.190
0.185
0.180
0.175
0.170
0.165
Marathon Oil Corporation
Devon Energy Corporation
Freeport-McMoRan Inc.
Helmerich & Payne Inc.
Concho Resources Inc.
1
2
3
4
5
rank of coefficients
Sector
Energy
Materials


5 smallest negative Coefficient Values in the 3rd Principal Component
Alaska Air Group Inc.
Regeneron Pharmaceuticals Inc.
Delta Air Lines Inc.
United Continental Holdings Inc.
American Airlines Group Inc.
Coefficients
-0.080
-0.085
-0.090
-0.095
-0.100
500
501
502
503
504
rank of coefficients
Sector
Industrials
Health Care


The return from the start date for the stocks with 5 largest coefficients
Return
400
200
0
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Date
Marathon Oil Corporation
Devon Energy Corporation
Freeport-McMoRan Inc.
Helmerich & Payne Inc.
Concho Resources Inc.


The return from the start date for the stocks with 5 smallest negative coefficients
Return
Date
4000
3000
2000
1000
0
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Alaska Air Group Inc.
Delta Air Lines Inc.
American Airlines Group Inc.
Regeneron Pharmaceuticals Inc.
United Continental Holdings Inc.