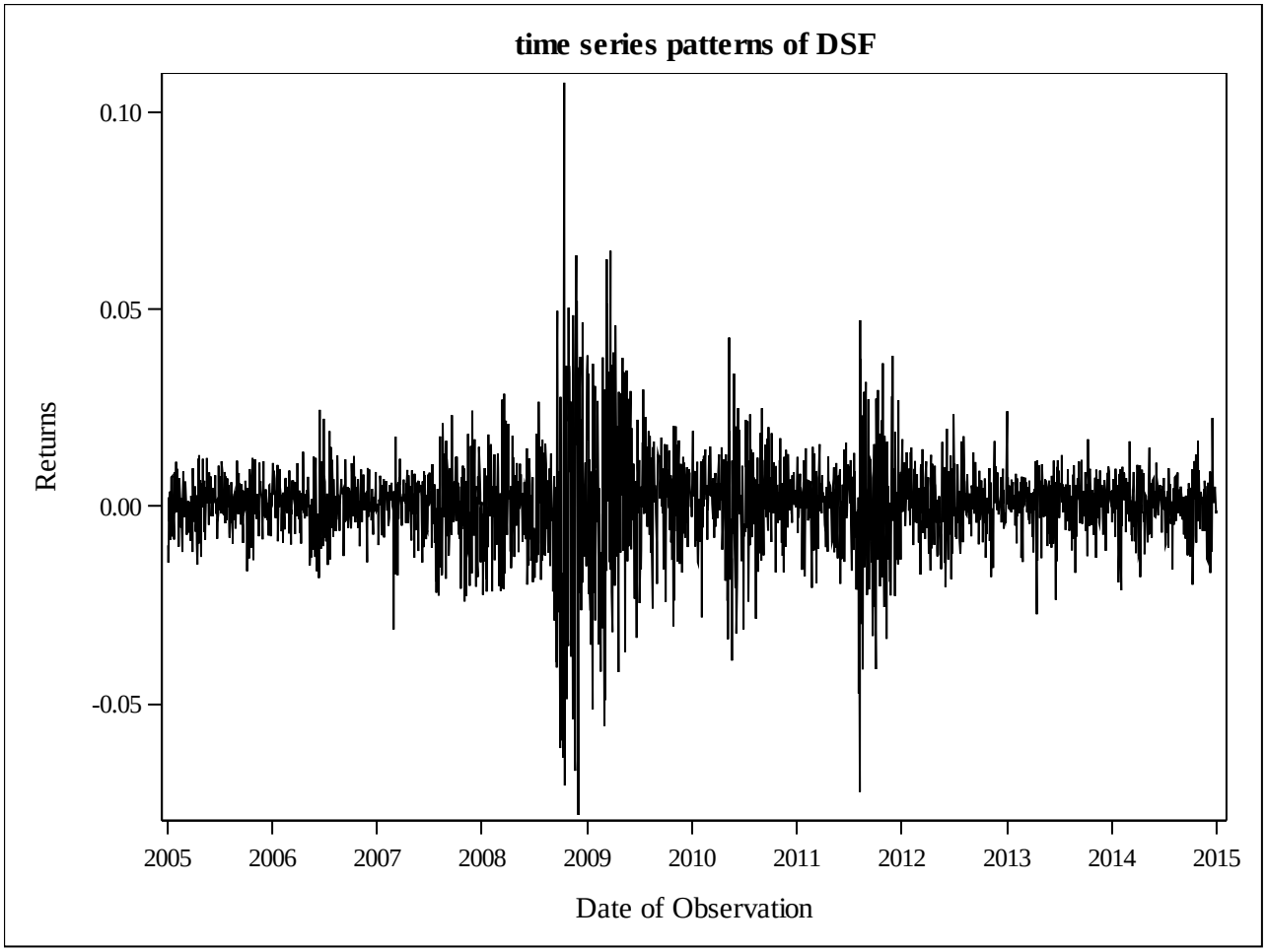
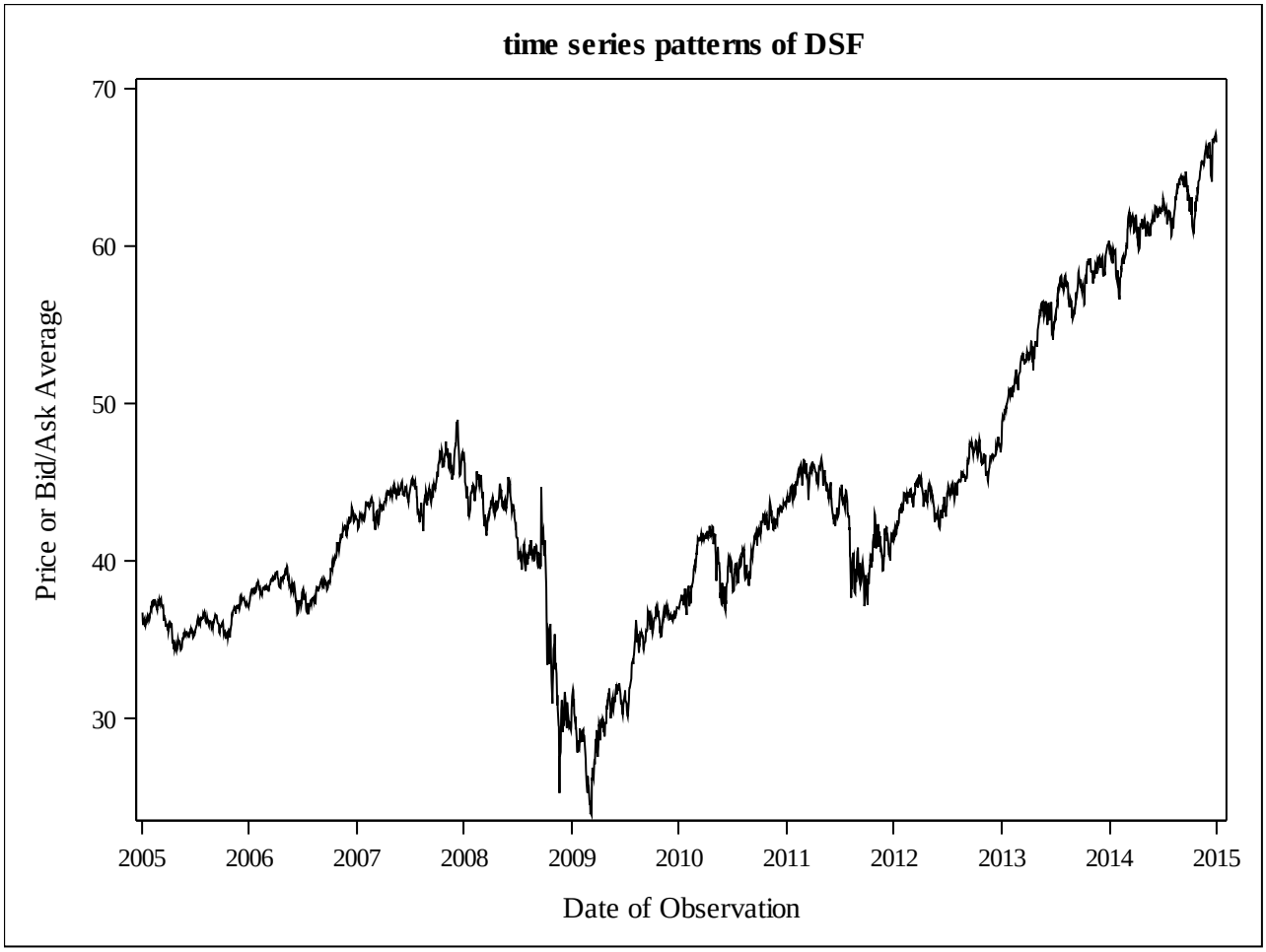
descriptive statistics of DSF

The MEANS Procedure

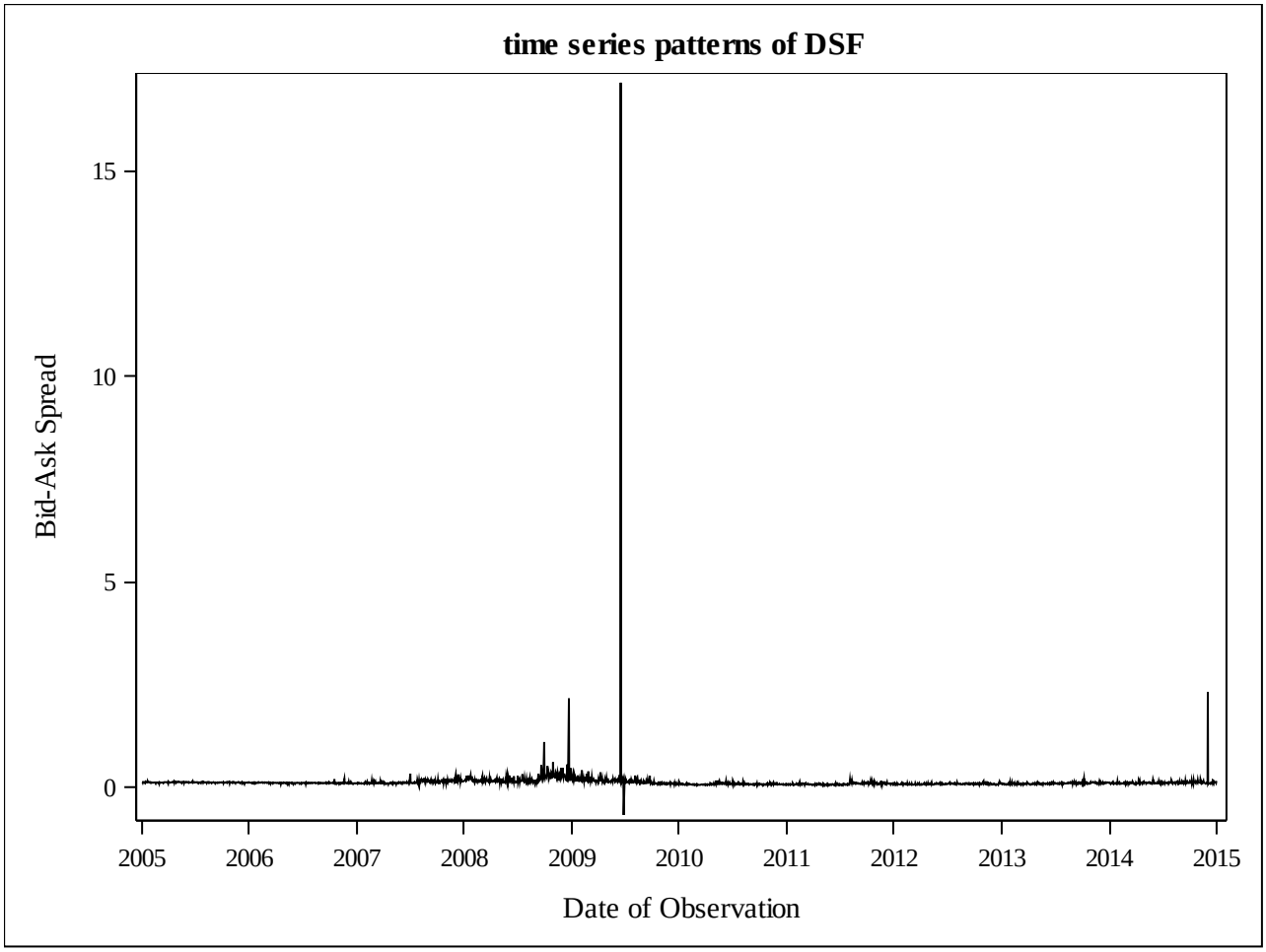
Variable	Label	N	Mean	Std Dev	Minimum	Maximum
RET	Returns	16992308	0.000484017	0.0379106	-0.9629630	19.0000000
PRC	Price or Bid/Ask Average	16997428	43.8963470	1555.36	0.0058000	229300.00
SPREAD	Bid-Ask Spread	16992547	0.1274740	27.6355484	-5207.27	112169.98
VOL	Volume	16997638	1004351.07	6672586.33	0	1897900032



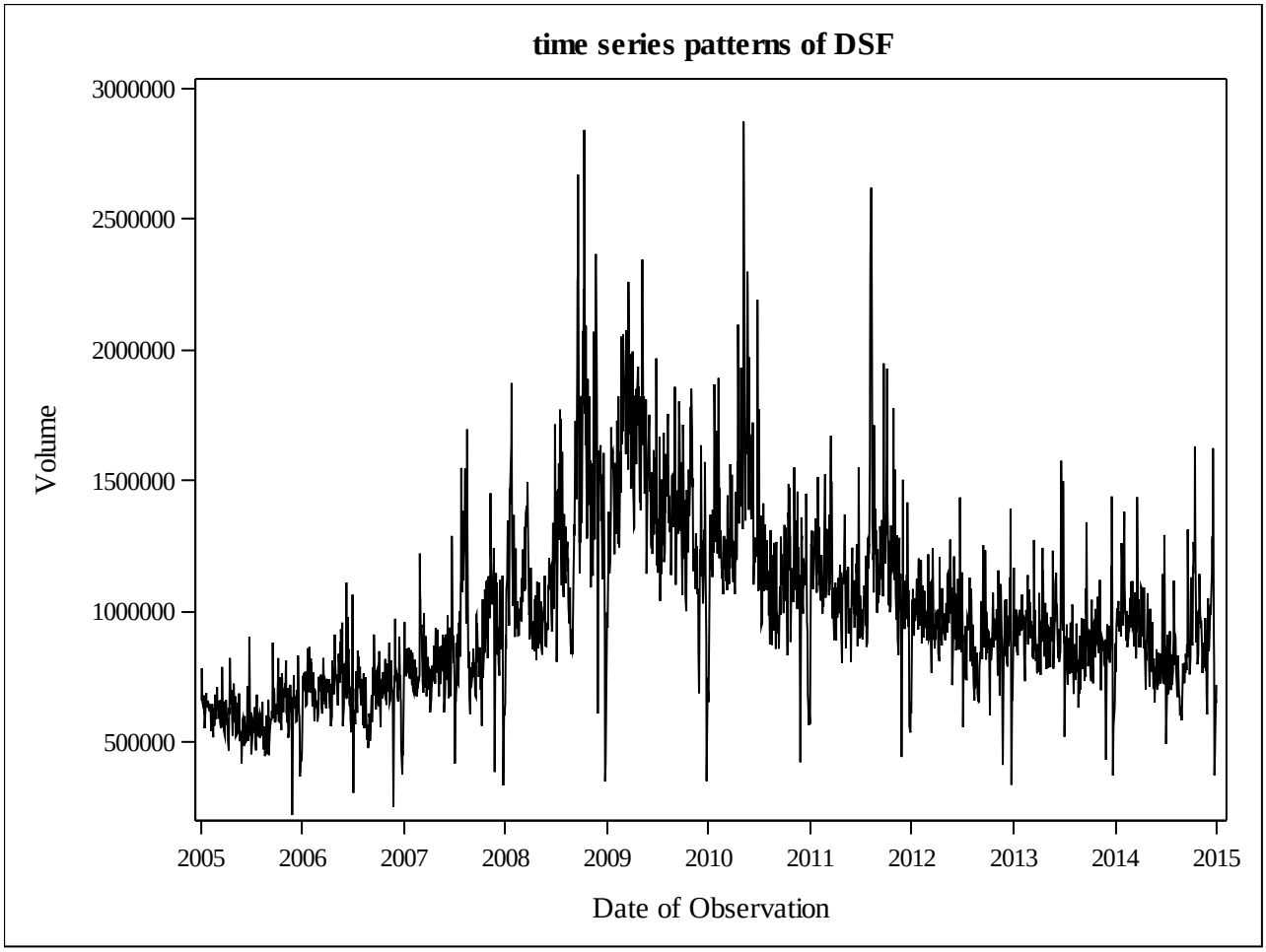
The mean of daily returns is around zero. And in certain time intervals, the volatility of returns was higher, like at the end of 2008. At most times, the daily returns were between -5% and +5%.

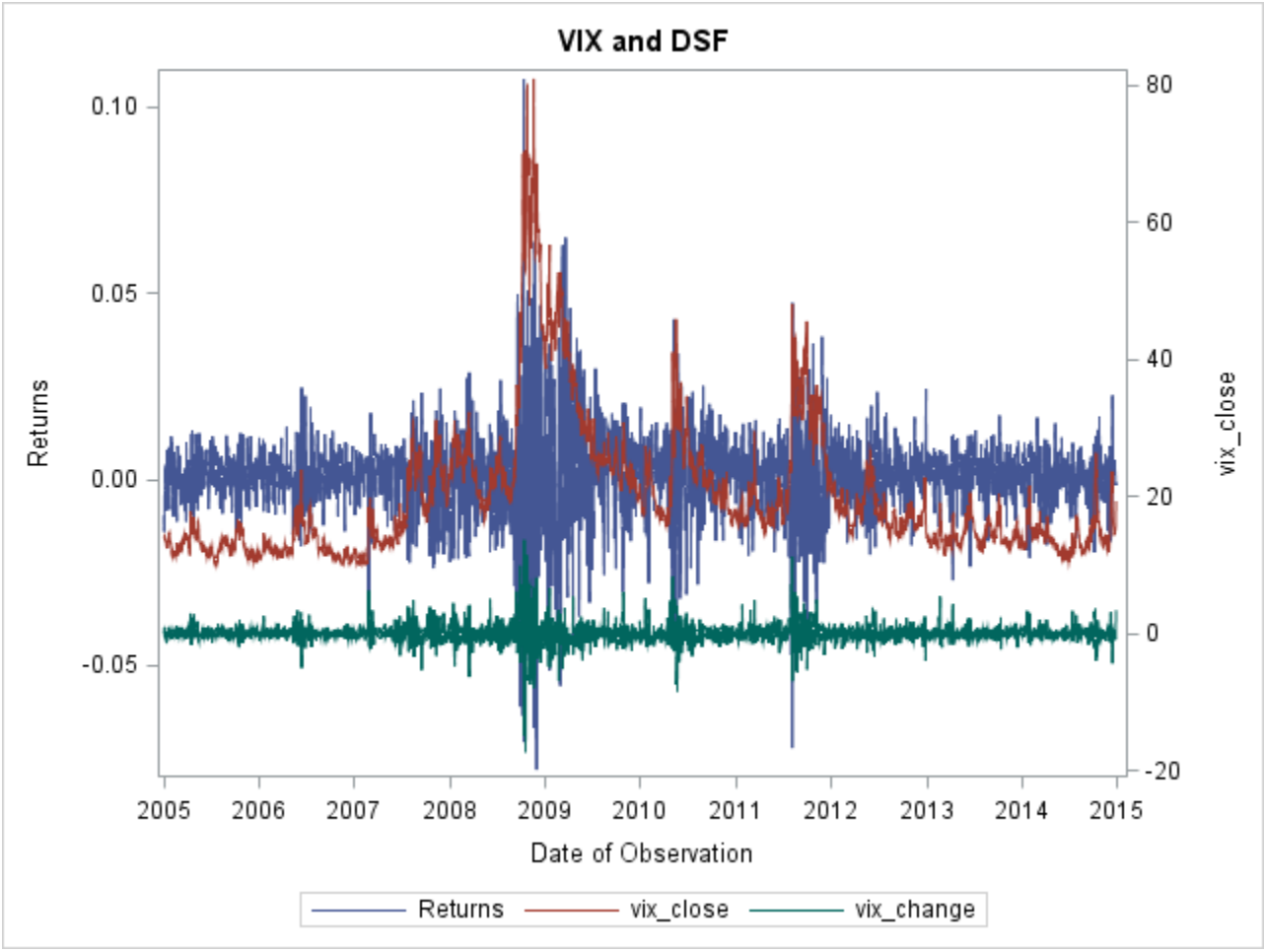


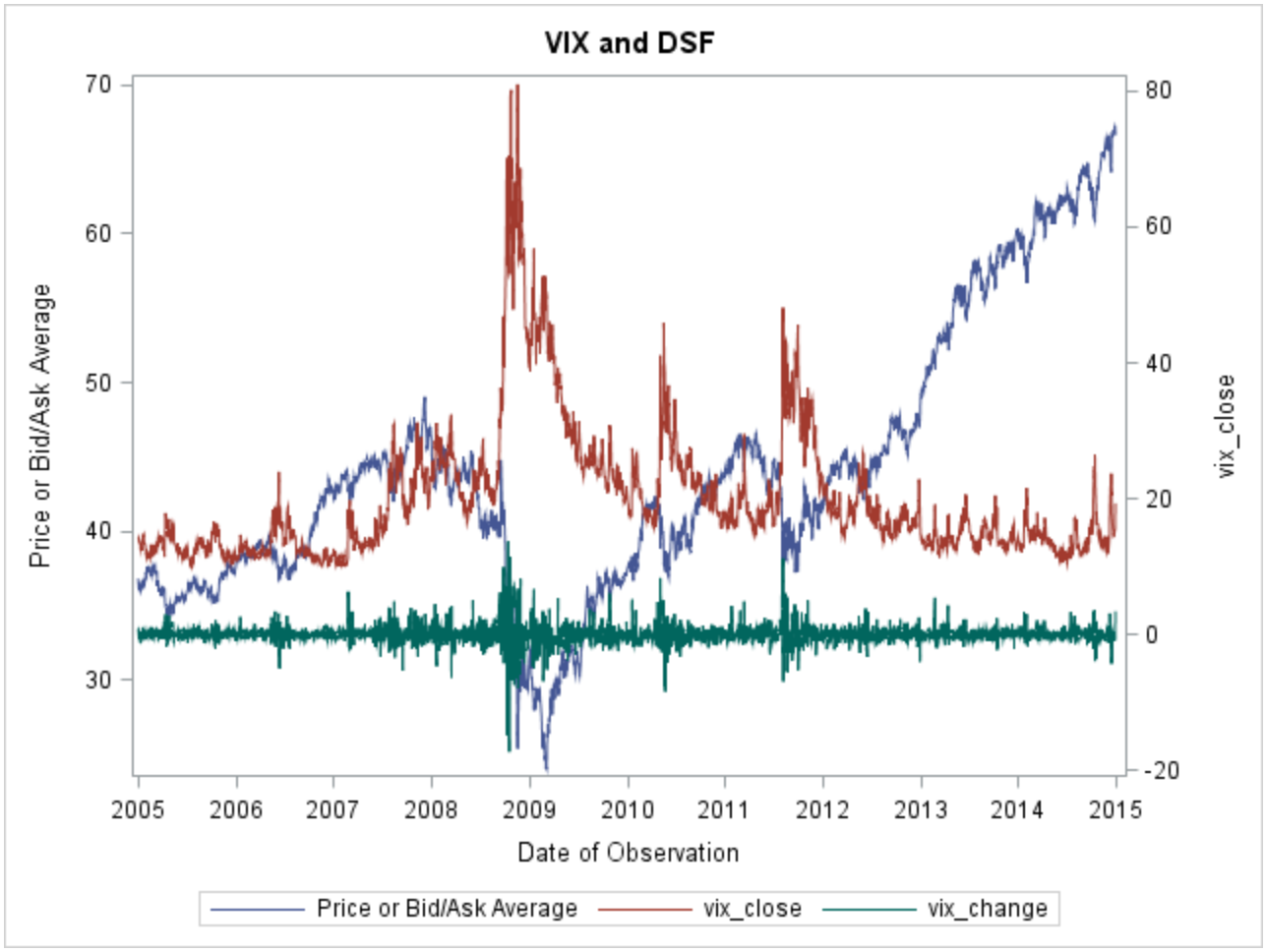
The mean of daily prices went up in a long term. But in 2008-2009, the prices dropped a lot and hit the bottom price. That was when financial crisis happened.

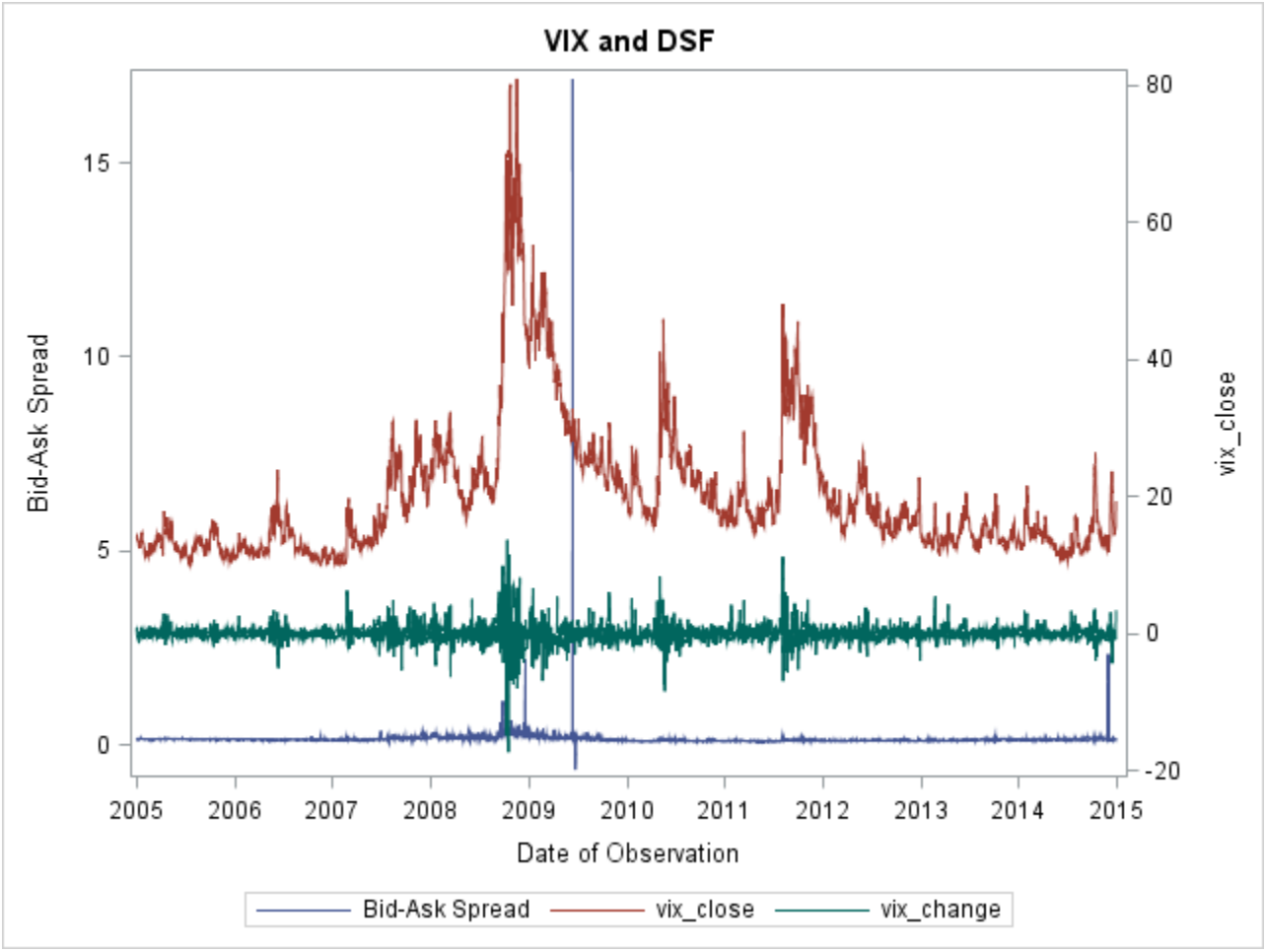


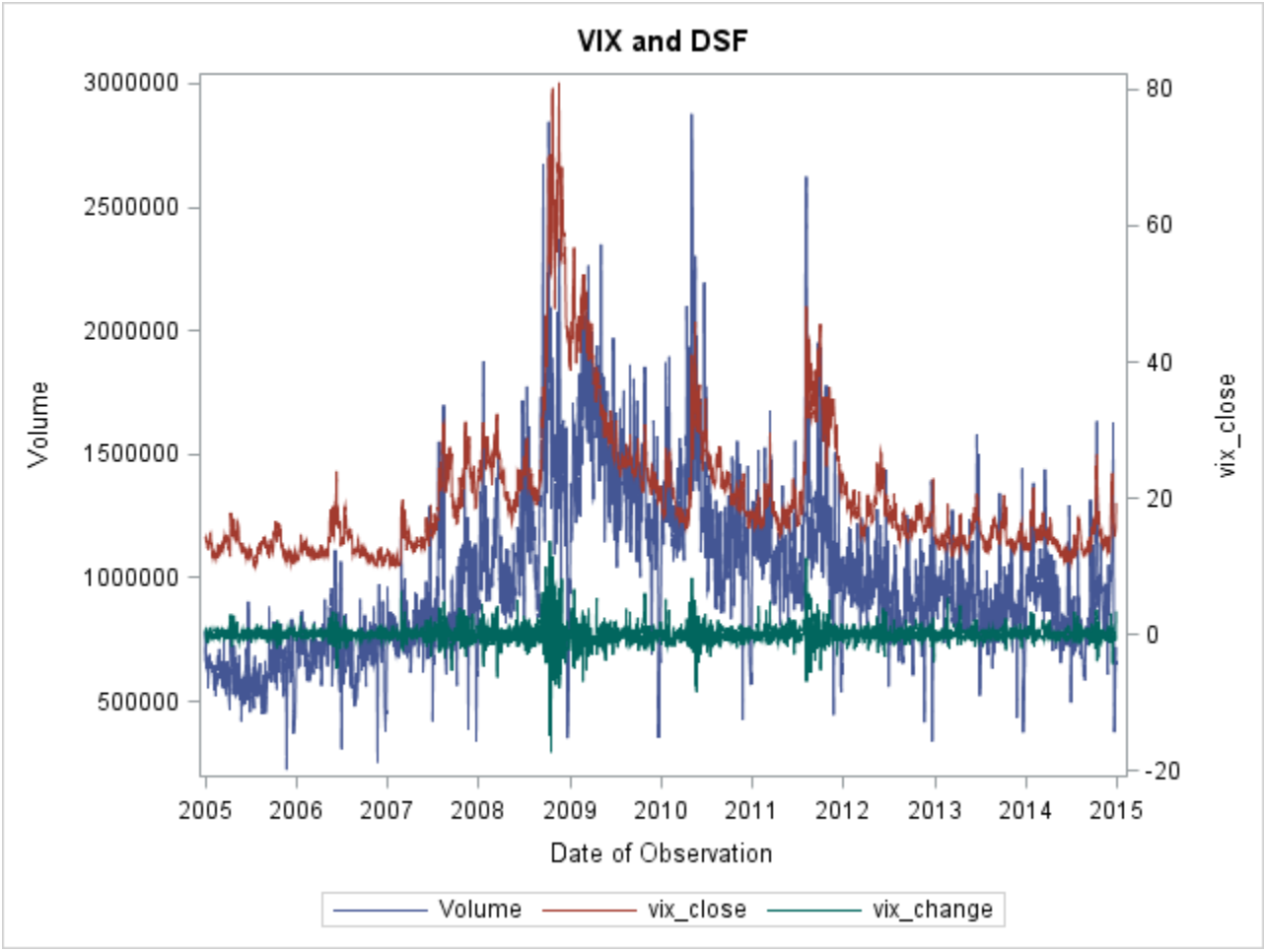
Bid-ask spread overtime was stable at most times, except for the time period of 2008-2009. Higher bid-ask implies less market liquidity.


time series patterns of DSF
Volume
3000000
2500000
2000000
1500000
1000000
500000
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
Date of Observation


VIX and DSF
Returns
vix_close
0.10
0.05
0.00
-0.05
80
60
40
20
0
-20
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
Date of Observation
Returns
vix_close
vix_change


VIX and DSF
Price or Bid/Ask Average
vix_close
70
60
50
40
30
80
60
40
20
0
-20
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
Date of Observation
Price or Bid/Ask Average
vix_close
vix_change


VIX and DSF
Bid-Ask Spread
vix_close
15
10
5
0
80
60
40
20
0
-20
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
Date of Observation
Bid-Ask Spread
vix_close
vix_change


VIX and DSF
Volume
3000000
2500000
2000000
1500000
1000000
500000
vix_close
80
60
40
20
0
-20
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
Date of Observation
Volume
vix_close
vix_change

VIX and DSF

The CORR Procedure

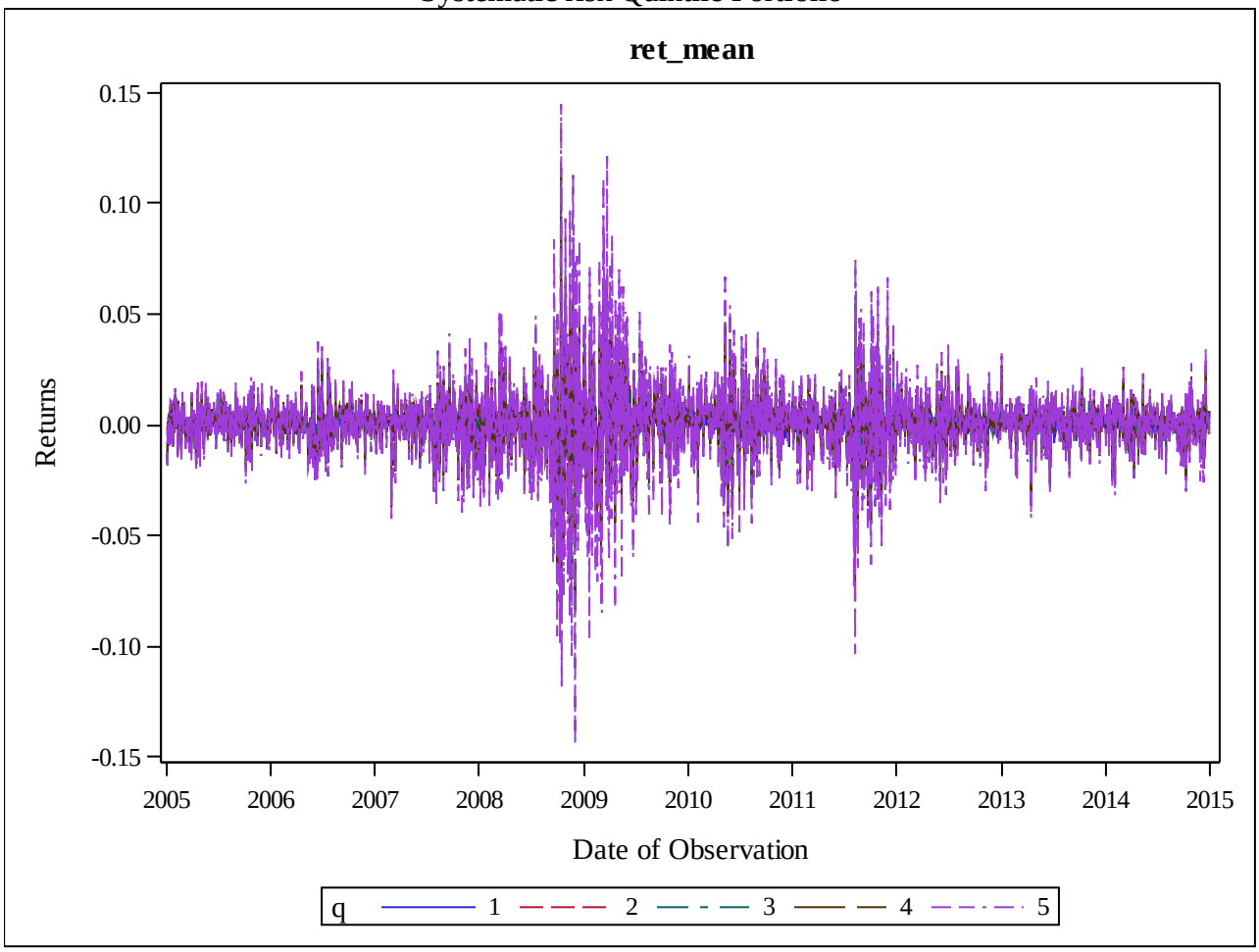
2 With Variables:	vix_close vix_change
4 Variables:	RET PRC SPREAD VOL

Simple Statistics							
Variable	**N**	**Mean**	**Std Dev**	**Sum**	**Minimum**	**Maximum**	**Label**
vix_close	2517	20.03838	9.98331	50437	9.89000	80.86000	
vix_change	2517	-0.10770	1.55605	-271.07000	-17.43000	13.56000	
RET	2517	0.0004980	0.01194	1.25352	-0.07824	0.10742	Returns
PRC	2517	43.83195	8.85832	110325	23.91290	67.15286	Price or Bid/Ask Average
SPREAD	2517	0.12723	0.34923	320.22804	-0.66825	17.14663	Bid-Ask Spread
VOL	2517	1005998	342276	2532096126	219732	2873580	Volume

Pearson Correlation Coefficients, N = 2517 Prob > |r| under H0: Rho=0				
	RET	**PRC**	**SPREAD**	**VOL**
vix_close	-0.12214 <.0001	-0.46692 <.0001	0.11427 <.0001	0.70105 <.0001
vix_change	-0.67723 <.0001	0.02116 0.2887	0.03088 0.1214	0.06354 0.0014

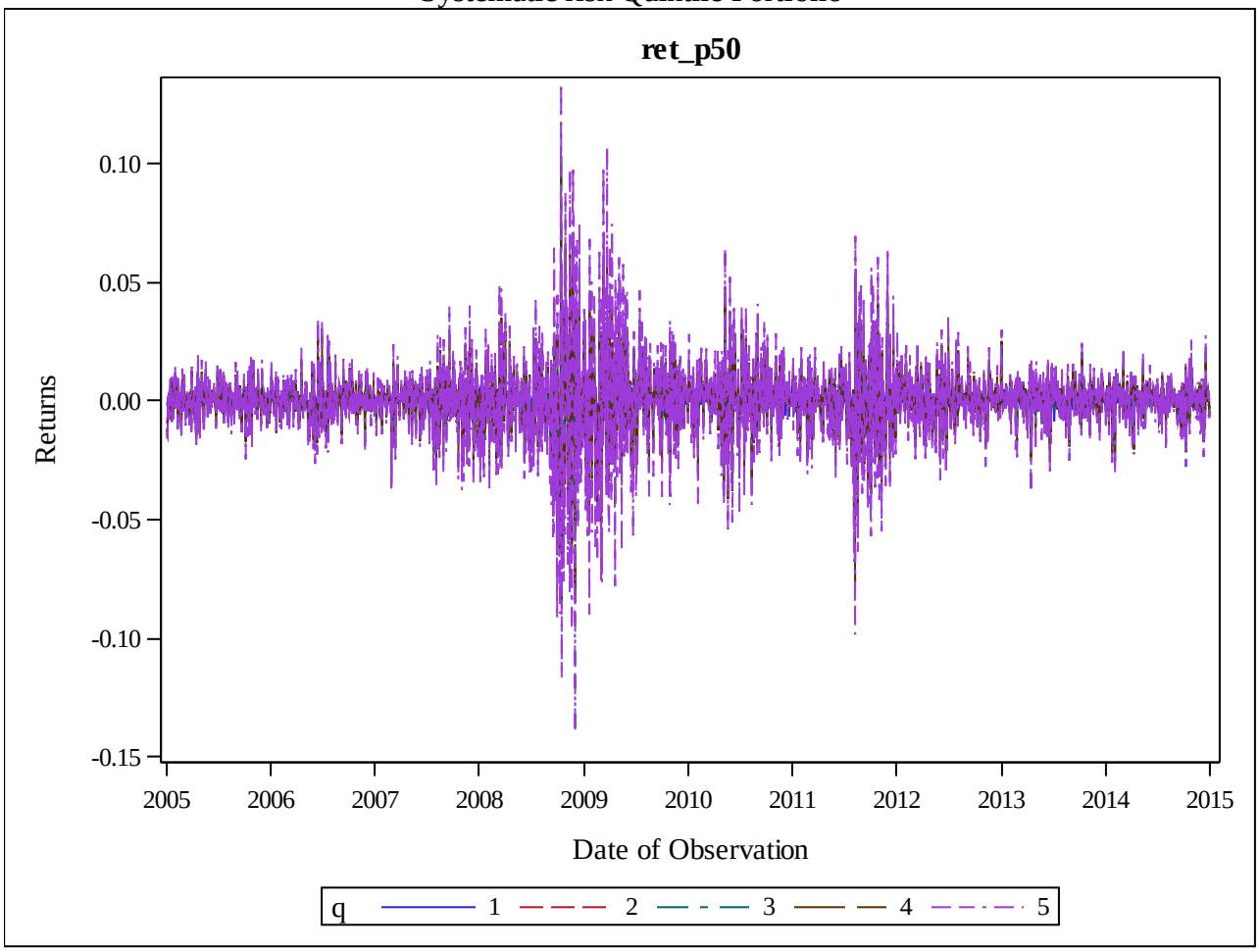
VIX describes the volatility of market index. So it is positively correlated with volume because higher market volatility means more trades of the stocks. VIX is also negatively correlated with stock prices and daily change of VIX is negatively correlated with stock returns.

Systematic risk Quintile Portfolio



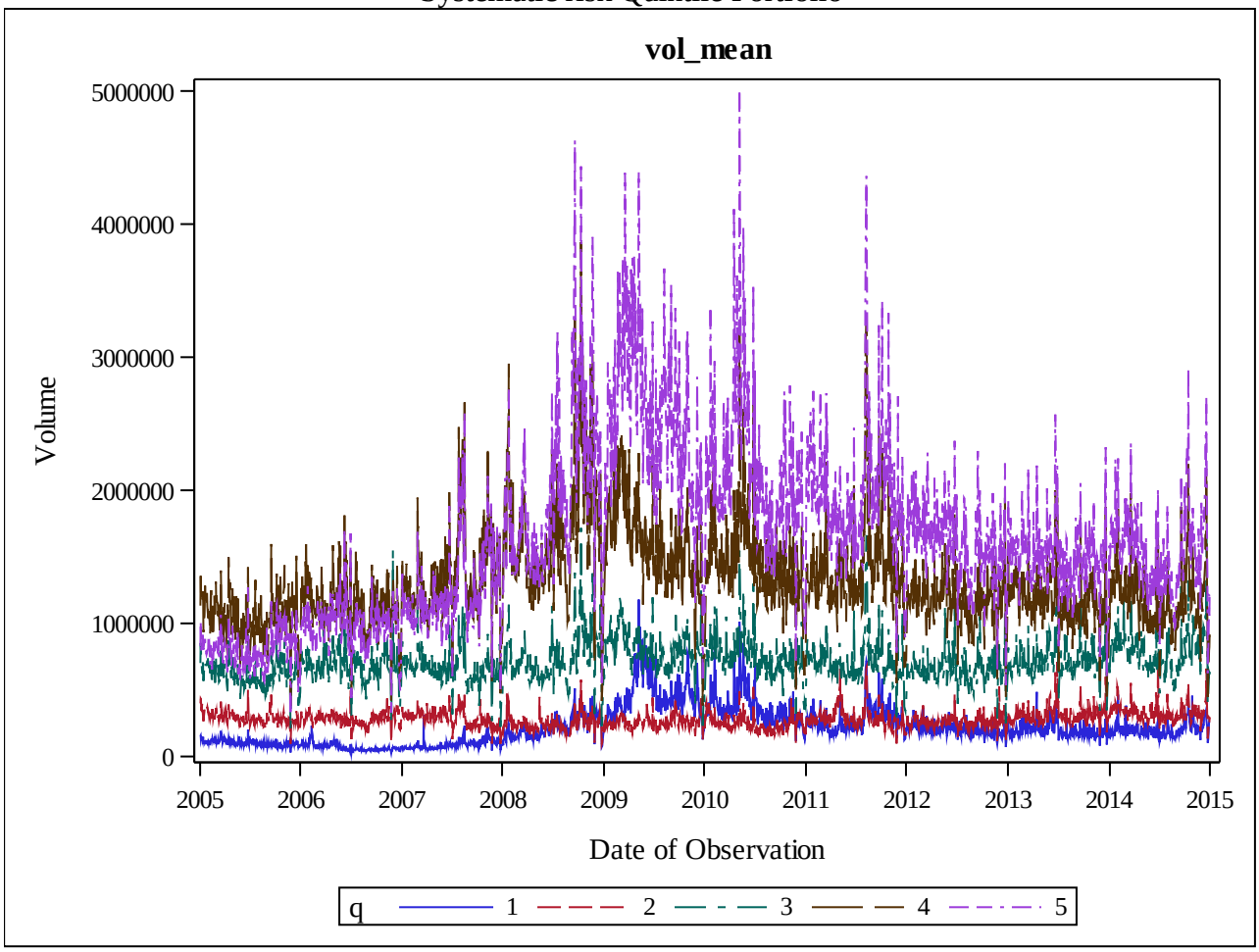
Companies with high systematic risks had more similar returns to the market returns. When market return was high, the companies' return was higher and when market return was low, the companies' return was lower. The returns of companies with less systematic risks were the opposite. They didn't change much compared to changes in market returns. Also the companies with higher systematic risks had more volatile returns.

Systematic risk Quintile Portfolio

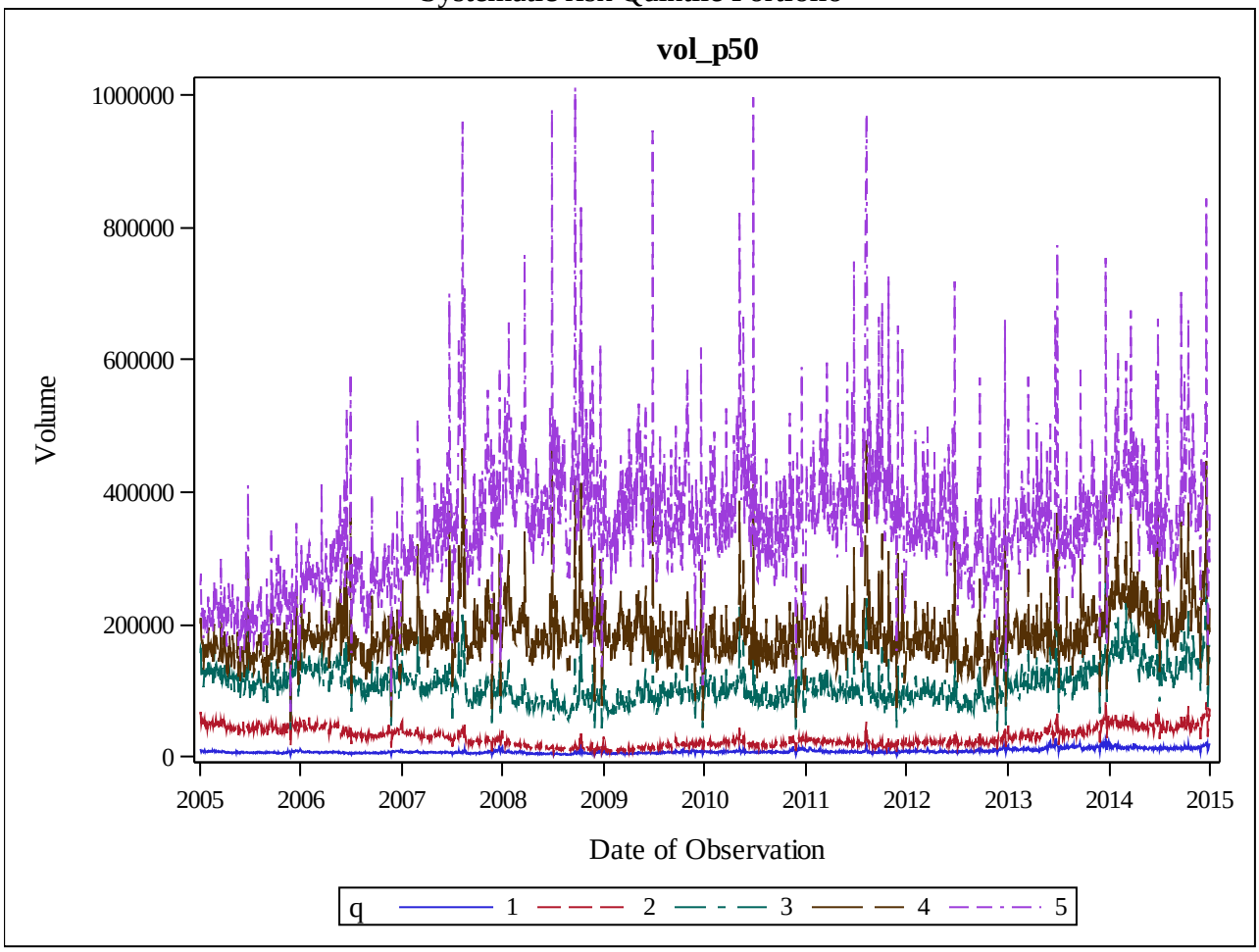


The median of daily returns had the same trends with mean of daily returns.

Systematic risk Quintile Portfolio

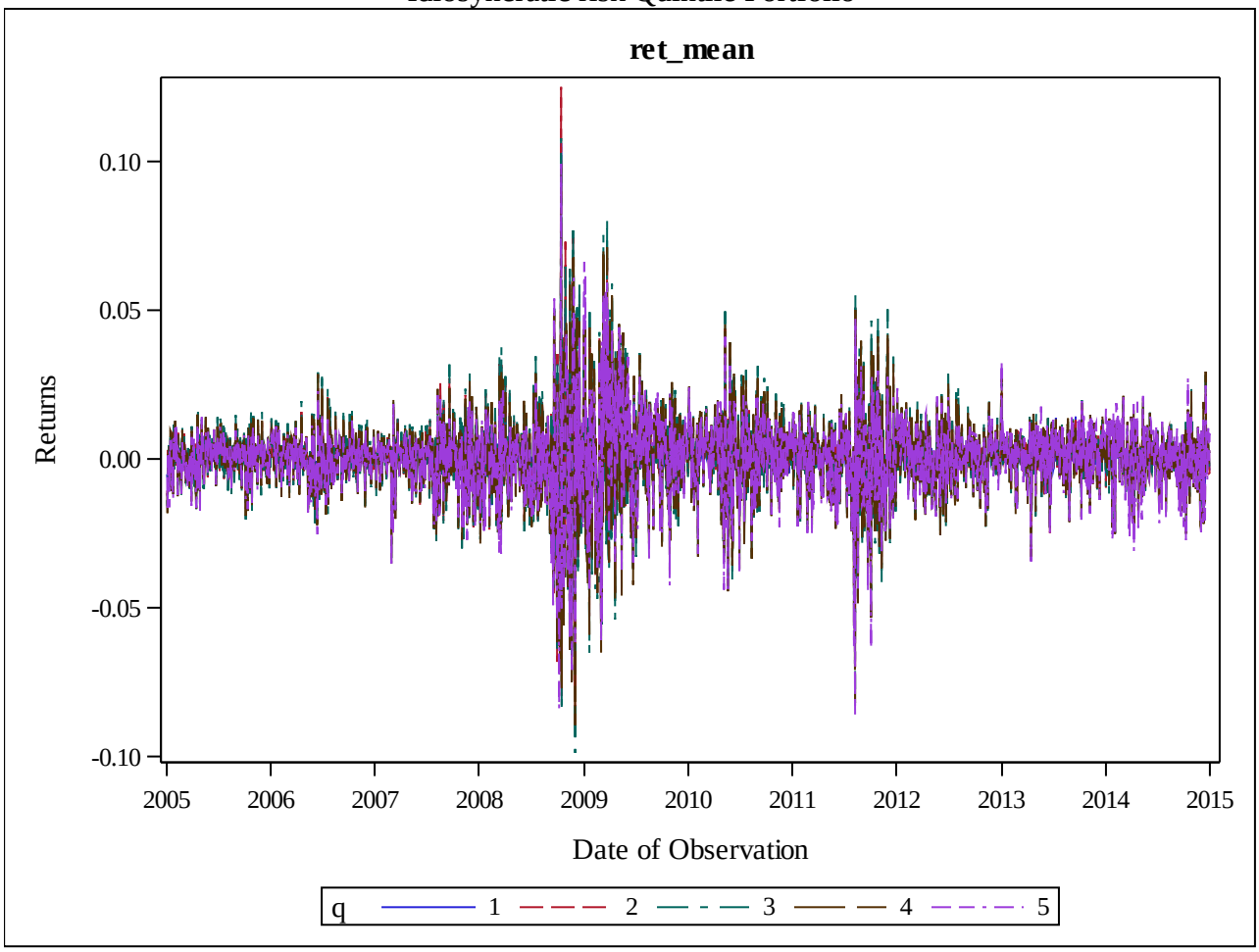


Systematic risk Quintile Portfolio

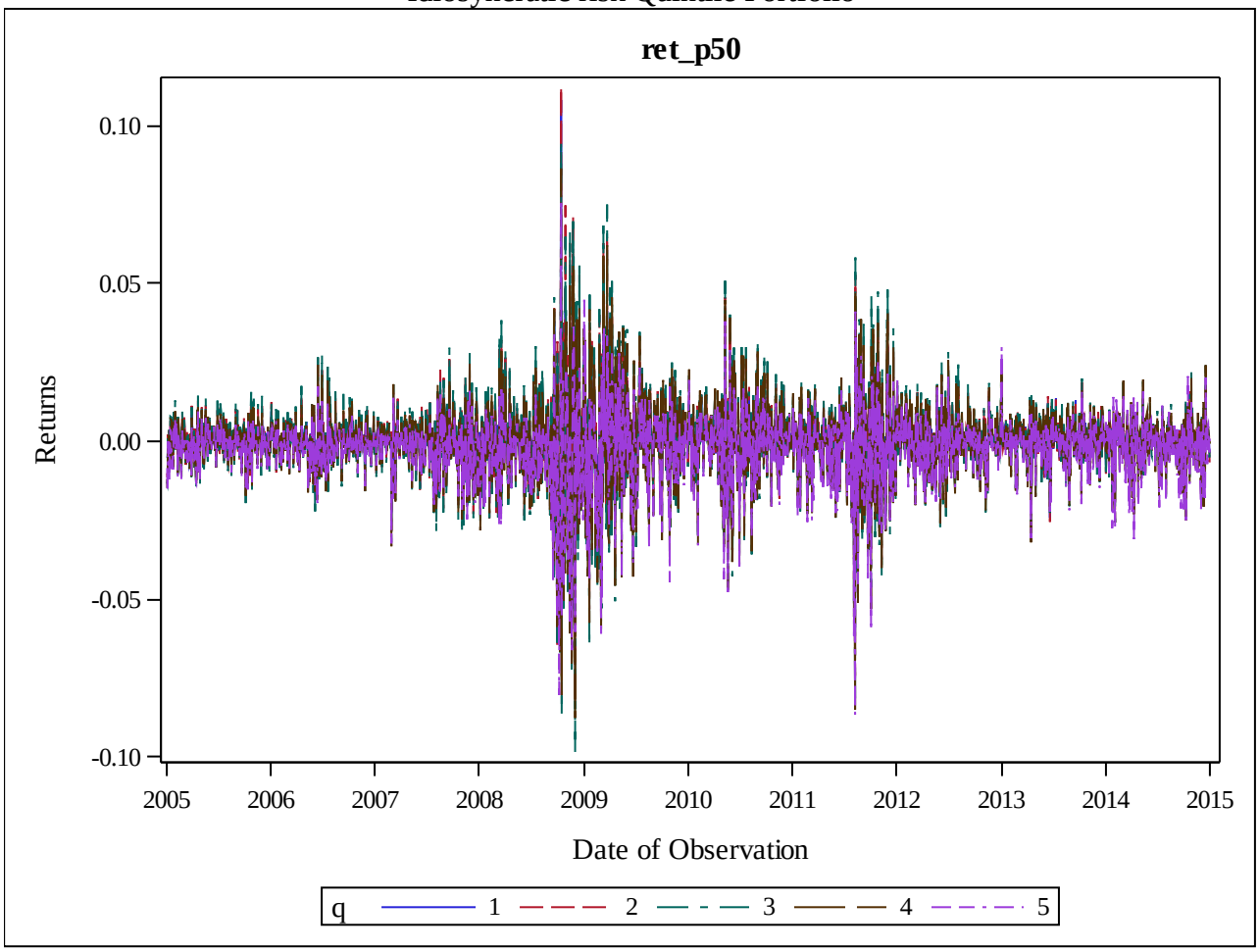


The systematic risk and volumes of companies were highly correlated. Companies with more systematic risks also had more trading volume. This is because the s&p 500 index is built using weighted average of stock price. Larger companies have more market capital, thus have more weight in the s&p 500 index and are more relative to the market return.

Idiosyncratic risk Quintile Portfolio

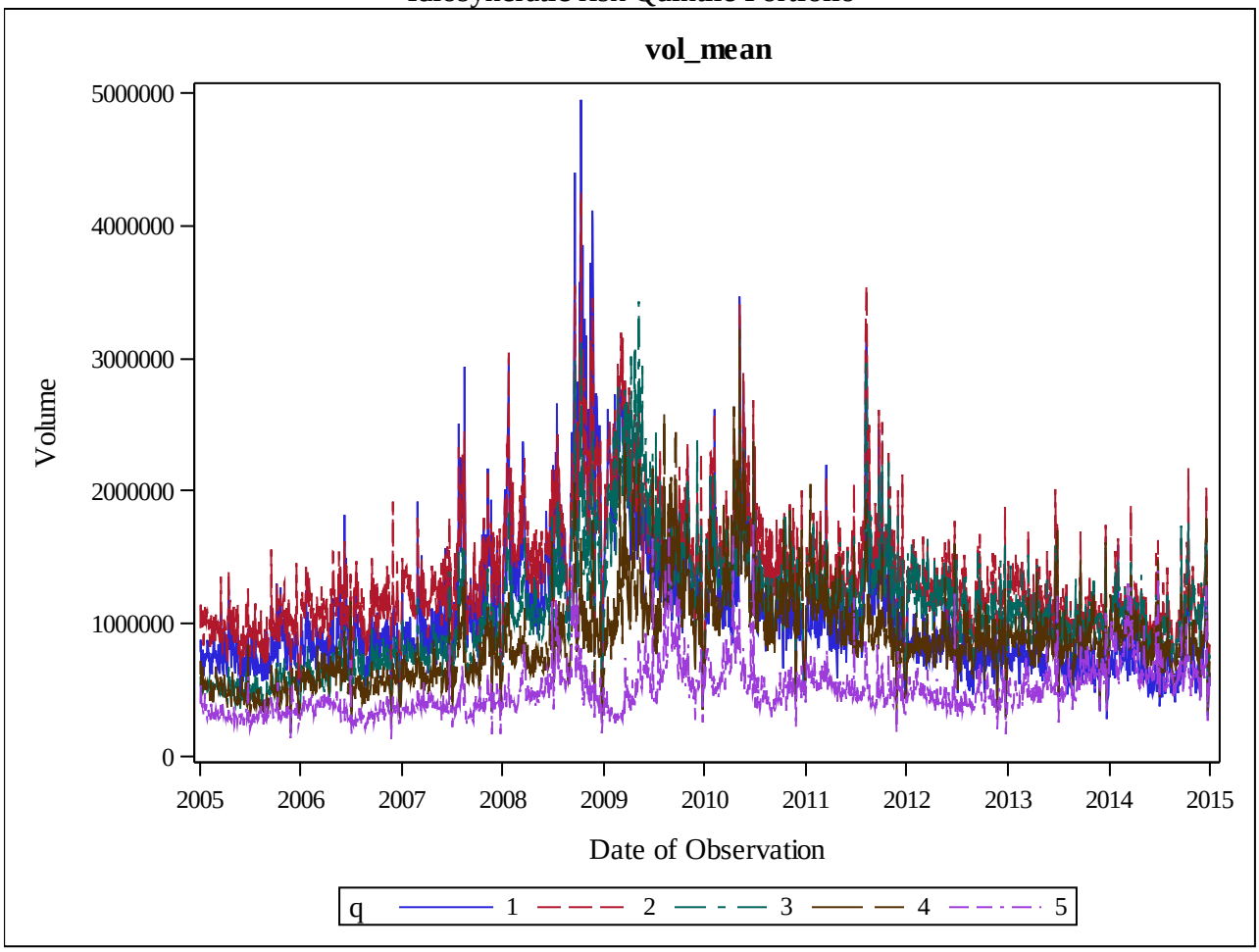


Idiosyncratic risk Quintile Portfolio

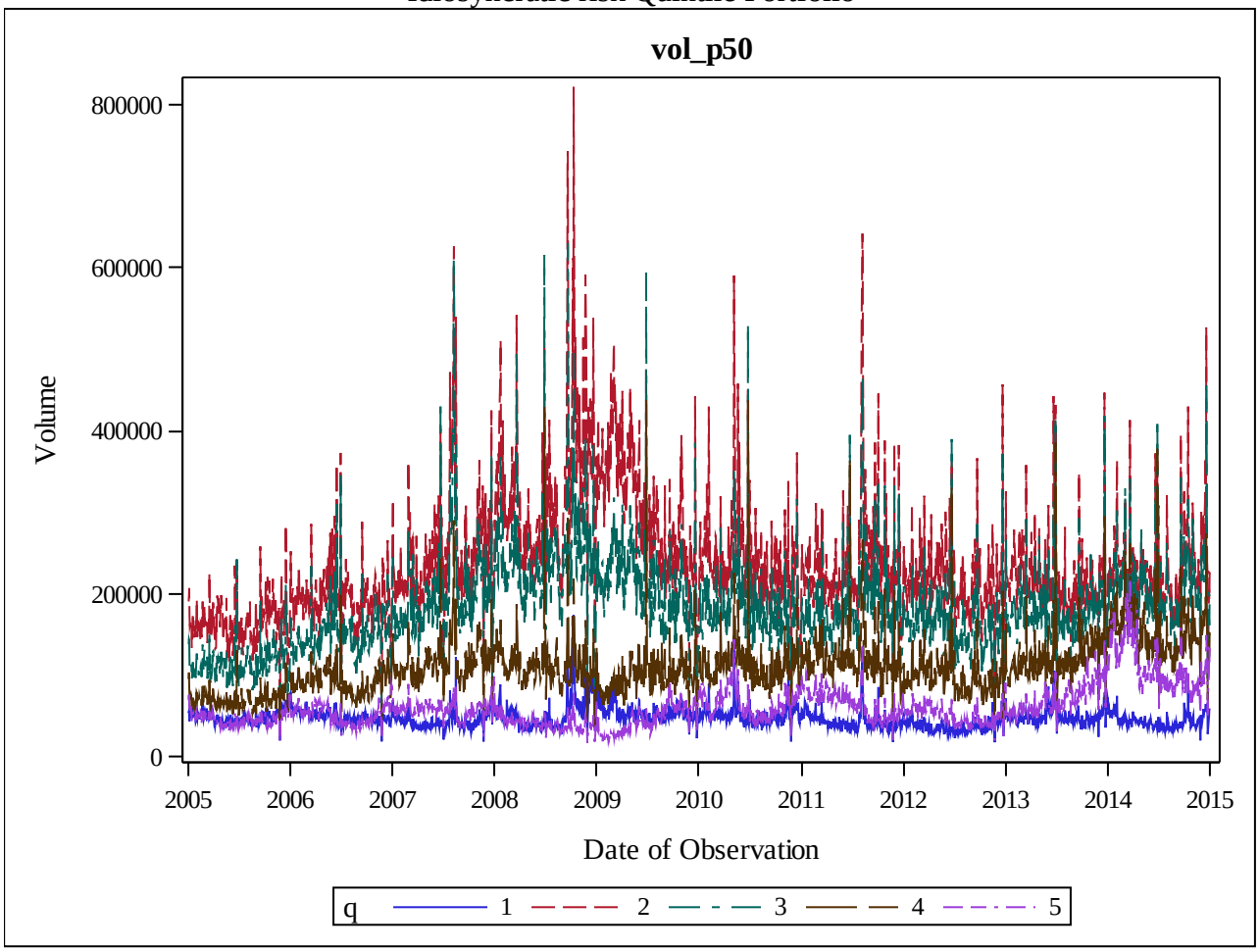


For idiosyncratic risk quintile portfolios, the returns were also around zero.

Idiosyncratic risk Quintile Portfolio



Idiosyncratic risk Quintile Portfolio



The volumes were not related to idiosyncratic risk since companies with both largest idiosyncratic risk and smallest idiosyncratic risk could have low volume.