Sector Correlations & Rotational Investing

Helena Collmorgen, Stephen F. Austin State University
Department of Economics and Finance, Faculty Sponsor Dr. Emiliano Giudici

Risk vs Returns

The correlation between risk and expected return of an investment is very high.
Because investors are typically risk adverse, they will take on more risk only if rewarded with higher expected returns.

Two types of risk:

1. Systematic Risk
Inherently present in the market and cannot be eliminated.

2. Unsystematic (Diversifiable)Risk
Can be nearly eliminated through proper diversification.

ETFs

Think of an ETF as a basket holding many securities that is traded like a single stock on an exchange. ETFs can be bought/sold at any time of the day and with different types of orders.

ETFs provide instant diversification, lowering overall portfolio risk

Standard & Poor's Depository Receipt (SPY): ETF that follows the overall market by investing in the top 500 companies (S&P500).

The SPY contains 11 different sectors. A sector is a group of companies within a specific industry.

Each sector has its own ticker symbol:

XLE - Energy
XLU - Utilities
XLK - Technology
XLB - Materials
XLP - Cons. Staples
XLI - Industrials
XLY - Cons. Discretionary
XLC - Comm. Services
XLV - Healthcare
XLF - Financials
XLRE - Real Estate

Sector Rotation: Investors will "rotate" funds between sectors depending on the outlook of the market to maximize profits.

Questions

1. Are there any pairs of sectors that appear to be correlated in any way?

2. If so, are correlations between sectors stable under different market conditions?

The purpose of my research is to uncover information that will allow for more successful rotational investing decisions.

Data

Daily adjusted closing price data of the SPY was used to create the black line on the chart. This line represents the performance of the entire market over time. Obvious downturns in the market are highlighted.

Adj. closing price data of the 11 sectors (excluding XLC & XLRE) was used to compute **daily returns.**

The daily returns were used to compute a **correlation table** of returns over the entire time period.

Correl Returns 2005-2019

	XLY	*XLP*	*XLE*	*XLF*	*XLV*	*XLI*	*XLB*	*XLK*	*XLU*	*SPY*
XLY	1.000									
XLP	0.721	1.000								
XLE	0.660	0.557	1.000							
XLF	0.777	0.608	0.609	1.000						
XLV	0.723	0.712	0.593	0.611	1.000					
XLI	0.861	0.710	0.736	0.767	0.738	1.000				
XLB	0.772	0.634	0.803	0.690	0.675	0.855	1.000			
XLK	0.841	0.693	0.683	0.711	0.720	0.829	0.770	1.000		
XLU	0.545	0.666	0.573	0.483	0.568	0.567	0.551	0.558	1.000	
SPY	0.902	0.782	0.807	0.833	0.820	0.916	0.865	0.913	0.666	1.000

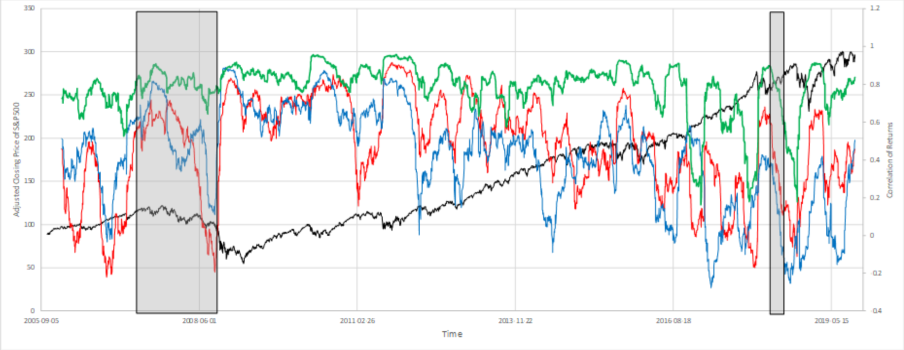
Similar correlation tables were created for each of the 5 market conditions shown in the graph. In these tables, I identified:

1. **Pairs with consistently high correlations**
2. **Pairs with consistently low correlations**
3. **Pairs with volatile correlations throughout varying conditions**

XLI & XLU appeared to have a high correlation
XLI & XLY appeared to have a low correlation
XLP & XLE appeared to have a volatile correlation

I computed running correlations of each pair using the returns from the previous 3 months at each point in time, and plotted the results on a secondary axis against the original graph

- While XLI & XLU takes a dip beginning in late 2016, it does appear to have a high overall correlation in relation to the other pairs.
- XLI & XLY and XLP & XLE seem to have varying correlations throughout market conditions.
- XLI & XLY and XLP & XLE appear to grow stronger during down-market periods and weaker during the huge upmarket (2-13-2009 to 9-20-2019). An inverse relationship between the correlations of the sector ETF pairs and the SPY's performance is visible.



Conclusion

To answer the questions:

1. **The correlation tables show several sector ETF pairs that display highly correlated returns.**

Investing in these assets together would be a bad idea for an investor looking to lower diversifiable risk.
(I was unable to find ETF pairs with considerably inverse relationships)

2. **The study uncovered pairs of ETFs with varying correlations throuhgout market conditions, such as XLP & XLE and XLI & XLY which generally appear stronger during down-markets and weaker during up-markets.**

However, the correlations seem to change considerably while the market is steadily inclining, creating many false signals. Rotational investing could be difficult to implement here.