A Smart Beta Portfolio Weighting Model for the SPDR Industrials Sector: An Empirical Analysis 2009-2016

Will Perez

Advisors: Dr. Robert Dean and Dr. Tony Caporale

- **Study Purpose**
  - Determine if a return/risk
  - Smart beta model
  - Can outperform the market
- **Factor Weight: Coefficient of Variation (COV)**
- **Factor Strategy: Invert COV**
- **Test Universe: XLI, 20 stocks**
- **Model Construction**

(1) MEPSi= [EPSi(t) + EPSi(t-1) + EPSi(t-2)]/ 3

(2) SDi= $\frac{\sqrt{\sum_{k=1}^{n}(EPSi(t)-MEPSi)^2}}{N=3}$

(3) 1/ COV= $\frac{MESPi}{SDi}$

(4) Wi (t) = $\frac{1/\ COVi}{\frac{1}{\sum covi}}$

(5) Di (t) = Wi(t) * 1,000,000

(6) SHRi (t) = Di(t)/ Pi(t)

(7) MVi (t+1) = SHRi(t) * Pi(t+1)

(8) PV(t+1) = $\sum_{t=1}^{24} MVi\ (t+1)$

- Nomenclature
  - EPSi = Earnings per share
  - MEPSi = 3-year moving average
  - SDi = Standard deviation
  - SHRi = Shares held
  - Wi = Factor weight
  - Di = Dollars invested
  - MVi = Market value
  - PV = Portfolio value
  - i = ith stock
  - t = Time in years

Table 1

Cumulative Returns (2009-2016)

Portfolio	Returns	Model Alpha
1/ COV Model	240.19%	
XLI	99.29%	140.89%
SPY	92.25%	147.94%

Table 2

Cumulative Returns/ Annual Basis (2009-2016)

Year	Model	XLI	SPY
2009	24.52%	24.73%	22.87%
2010	77.75%	49.17%	39.41%
2011	69.00%	49.12%	41.43%
2012	87.56%	58.75%	53.70%
2013	160.80%	78.64%	69.69%
2014	191.59%	86.96%	80.35%
2015	174.76%	77.80%	77.39%
2016	240.19%	99.29%	92.25%

Table 3

Cumulative Alpha/ Annual Basis (2009-2016)

Year	Model vs. XLI	Model vs. SPY
2009	-0.21%	1.65%
2010	28.58%	38.34%
2011	19.88%	27.57%
2012	28.81%	33.86%
2013	82.17%	91.12%
2014	104.64%	111.24%
2015	96.96%	97.36%
2016	140.89%	147.94%

- **Conclusion:**

Conclusion: 1/ COV model outperforms SPY- cumulative returns

- 1/ COV model outperforms XLI- cumulative returns
- Annual Returns- model outperforms SPY 6/8 years
- Annual Returns- model outperforms XLI 5/8 years
- During growth years 2013-2014, model generated major portion of cumulative alpha