

Selected Risk and Skill Analytics

based on predictive Statistical Equity Risk Models built to isolate active contribution from passive differences, that explain 97% of out-of-sample variance and - uniquely - statistically prove persistent skill

Skill Analytics

Components of Incremental Return Isolate Passive returns (consistent passive exposure differences with benchmark), Timing returns (changes in passive exposures from long term average), and Security-selection returns.

This fund (VDIGX) has top five percentile security selection skill, despite significantly underperforming the benchmark:

	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>5 Years</u>
Incremental Return	-0.9	-2.5	-2.8	0.3	-6.4	-2.5
Components:						
Passive*	-4.1	-2.6	-1.9	-2.9	-7.4	-3.8
Security Selection	3.8	0.3	0.1	4.1	1.5	1.9
Timing	-0.6	0.0	-0.9	-1.1	-0.6	-0.6
Trading/Undefined	0.2	-0.2	-0.1	0.2	0.1	0.0

* Consistent market, sector, and style beta differences from index

Predictive Skill Metrics Properly measured, past performance is a predictive indicator of future performance.

Managers with top (bottom) decile security selection performance during the prior three years are approximately twice as likely to deliver positive (negative) security selection performance as not over subsequent three years.

Position-sizing Performance The difference between actual security-selection return and the return which would have been achieved if all positions had been equal weighted.

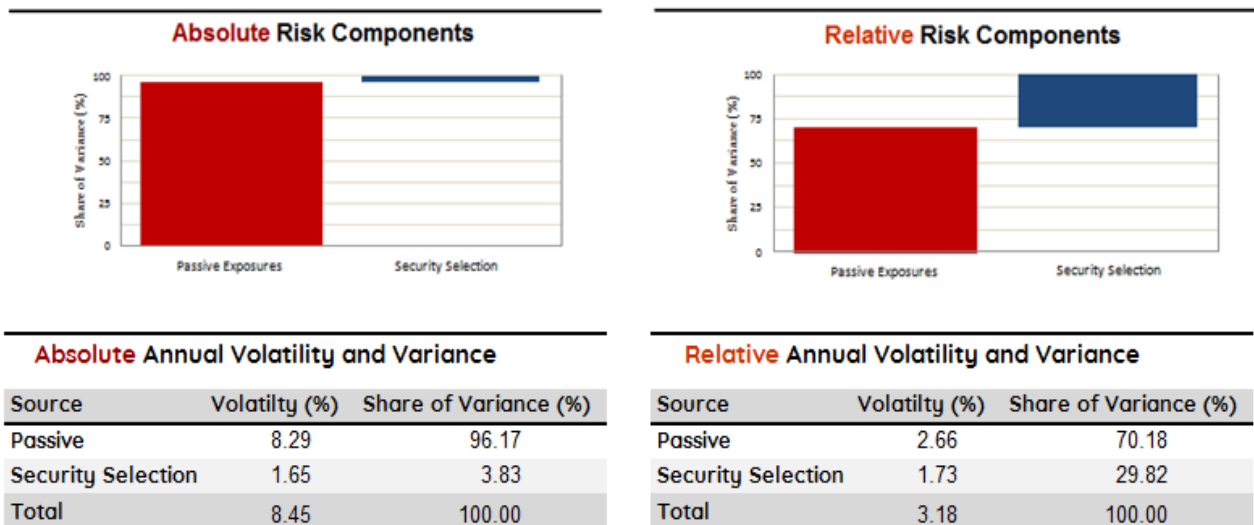
Significant position-sizing losses are an indication of an over-capitalized manager.

Risk Analytics

Current Absolute Risk Risk (expected volatility of portfolio returns) due to systematic factor exposures and idiosyncratic security risk.

Current Risk Relative to benchmark Relative risk (expected volatility of portfolio returns relative to the benchmark/tracking error) due to systematic passive exposures and idiosyncratic security risk. Monitoring this risk accomplishes the following:

- Ensures that managers take sufficient security selection risk to justify active fees.
- Identifies one-third of managers who are closet indexers, taking so little active risk that they are unlikely to generate active returns to clients, even if highly skilled.



Passive factors are market, sector, and style ETFs. Residuals are isolated security-selection impacts.

Manager Contribution to Portfolio Risk both absolute risk and variability of return relative to benchmark (tracking error)

Manager Impact on Aggregate Equity Risk

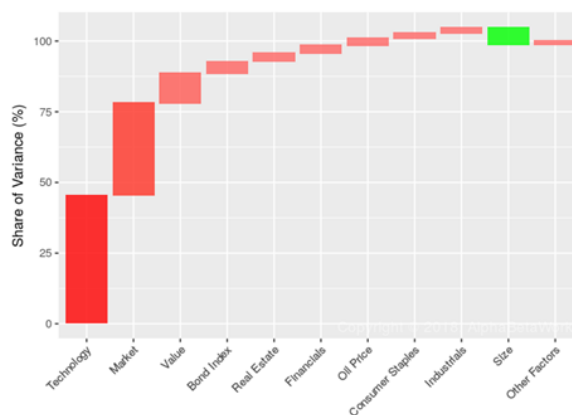
Aggregate Risk	w/o Mgr.	with Mgr.
Absolute	9.3	8.9
Relative to Benchmark	4.4	3.9
Share of Relative Variance		
Passive Factors	81	74
Security Selection	19	26

Current Risk Exposures Passive exposures ranked by their expected contribution to portfolio risk (absolute) and relative risk/tracking error (relative)

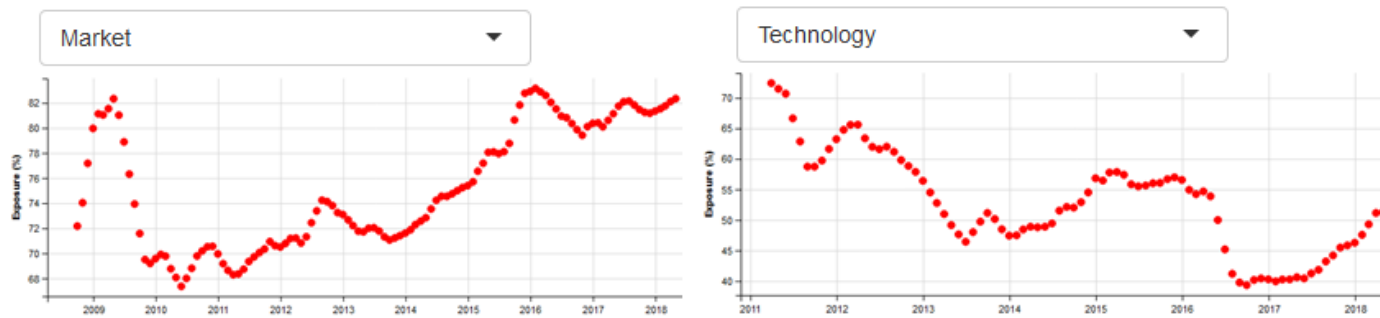
For this fund, two ETFs could offset over 75% of the tracking error not due to security selection.

Significant Passive Exposures Relative to Benchmark

Factor	Relative Exposure	Factor Volatility	Share of Relative Factor Variance	Share of Relative Total Variance
Technology	-42.0	6.2	50.6	37.5
Market	-18.7	10.0	29.8	22.1
Value	5.3	15.0	8.3	6.2
Bond Index	18.4	3.5	4.1	3.0
Industrials	6.9	4.6	3.0	2.2
Energy	2.6	14.7	2.6	1.9
Real Estate	2.0	12.7	2.3	1.7
Consumer Staples	5.9	8.3	1.6	1.2
Oil Price	-1.1	29.7	1.3	1.0
Size	4.9	10.4	-4.5	-3.4



Historical Point-in-Time Market, Sector, and Style Risk Exposures



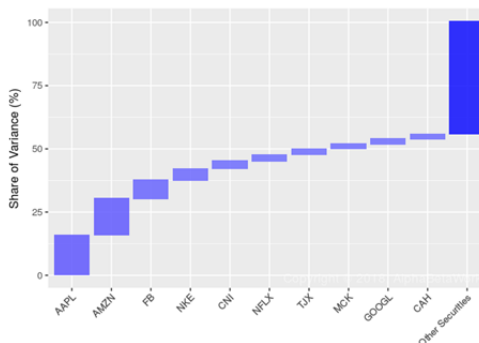
Significant Historical Risk Exposures

	Latest	Mean	Min.	Max.
Market	82.31	75.28	66.81	83.20
Health Care	13.17	16.17	12.58	20.48
Energy	3.13	8.32	2.53	17.30
Consumer Staples	11.39	12.91	9.67	16.85
Consumer Discretionary	19.72	13.70	5.69	23.85
Oil Price	-2.33	-0.66	-3.49	1.70
Industrials	15.44	13.35	10.44	18.07
Technology	6.29	8.25	6.08	12.56

Current Individual Security Contributions to Risk Top-ten securities shown ranked by expected contribution to relative risk (tracking error)

Significant Relative Security Exposures

Symbol	Name	Relative Exposure	Residual Volatility	Relative Residual Variance	Relative Total Variance
NIKE	NIKE, Inc. Class B	3.8	12.8	7.8	2.3
AAPL	Apple Inc.	-3.8	12.7	7.7	2.3
AMZN	Amazon.com, Inc.	-2.6	17.9	7.1	2.1
CNI	Canadian Nat'l Railway	3.0	12.1	4.5	1.3
TJX	TJX Companies Inc	3.2	10.6	3.9	1.2
FB	Facebook Class A	-1.7	19.6	3.7	1.1
UNP	Union Pacific	2.4	13.1	3.2	1.0
AMT	American Tower Corp.	2.6	11.8	3.0	0.9
COST	Costco Wholesale	2.4	11.6	2.6	0.8
CAH	Cardinal Health, Inc.	2.0	14.4	2.6	0.8



Current and Historical VaR Expected value at risk for various horizons/ probability of loss

Figure 0.9: Portfolio **Absolute** VaR

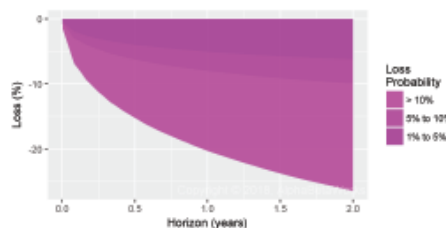


Table 0.3: Estimated **Absolute** Value at Risk (%)

Probability	Daily	Monthly	Annual
10%	0.88	3.88	12.28
5%	1.12	4.93	15.23
1%	1.58	6.83	20.26

Figure 0.10: Portfolio **Relative** VaR

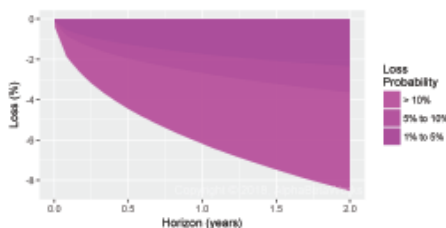


Table 0.4: Estimated **Relative** Value at Risk (%)

Probability	Daily	Monthly	Annual
10%	0.23	1.05	3.63
5%	0.29	1.34	4.66
1%	0.42	1.90	6.59

Stress Tests Expected portfolio performance under various return scenarios. Any custom stress tests are readily available

Figure 0.1: The 2008 Crash: **Absolute** Return Estimate

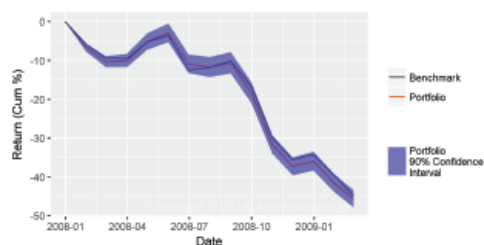


Figure 0.2: The Chinese Commodity Boom: **Relative** Return Estimate

