

# Barra US Total Market Equity Model for Long-Term Investors Factor Details

**December 2014**

This document provides the description, motivation, and summary of factor risk and return performance for all factors in the Barra US Total Market Equity Model for Long-Term Investors. For more details on each style factor descriptor, refer to [Barra US Total Market Equity Model Descriptor Details](#).

The model comprises 16 style factors.

- Beta
- Dividend Yield
- Earnings Quality
- Earnings Yield
- Growth
- Leverage
- Liquidity
- Long-Term Reversal
- Management Quality
- Mid Capitalization
- Momentum
- Profitability
- Prospect
- Residual Volatility
- Size
- Value

Details about the style factors are provided in the following table:

**Table 1: Factors and descriptors in the model categorized by similar styles**

Level 1 (Type)	Level 2 (Factor)	Level 3 (Descriptor)	
Size	Size	LNCAP	Natural log of Market Cap
	Mid Capitalization	SIZENL	Cube of Size
Value	Value	BTOP	Book-to-Price
		STOP	Sales-to-Price
		CFTOP	Cash-Flow-to-Price
		SVAL	Structural Valuation
	Earnings Yield	EM	Enterprise Multiple
		EPIBS	Analyst-Predicted Earnings-to-Price
		ETOP	Trailing Earnings-to-Price
	Dividend Yield	DTOP	Dividend-to-Price
		DPIBS	Predicted Dividend-to-Price
	Long-Term Reversal	LTRSTR	Long-Term Relative Strength
		LTHALPHA	Historical Alpha
Momentum	Momentum	RSTR	Relative Strength
Quality	Leverage	MLEV	Market Leverage
		BLEV	Book Leverage
		DTOA	Debt to Assets
	Earnings Quality	ABS	Accruals (Balance Sheet)
		ACF	Accruals (Cash Flow)
		VSAL	Variability in Sales
		VERN	Variability in Earnings
		VFLO	Variability in Cash-Flows
		SPIBS	Variability of Analyst EPS estimates to price
	Profitability	ROA	Return on Assets
		ROE	Return on Equity

Level 1 (Type)	Level 2 (Factor)	Level 3 (Descriptor)	
	Management Quality	GP	Gross Profitability
		GM	Gross Margin
		ATO	Asset Turnover
		AGRO	Asset Growth
		IGRO	Issuance Growth
		CXGRO	Capital Expenditure Growth
		CX	Capital Expenditure
Volatility	Beta	HBETA	Historical Beta
	Residual Volatility	HSIGMA	Historical Sigma
		IVOLC1	Implied Volatility 1 month Call
		IVOLC3	Implied Volatility 3 month Call
		IVOLP1	Implied Volatility 1 month Put
		IVOLP3	Implied Volatility 3 month Put
	Prospect	SKEW	Skewness
		MAD	Maximum Drawdown
Liquidity	Liquidity	STOM	Share Turnover, 1month
		STOQ	Average Share Turnover, 3month
		STOA	Average Share Turnover, 12month
		LIQMA	Modified Amihud Measure
		LIQPS	Pastor-Stambaugh Measure
Growth	Growth	EGIBS	Earnings per Share Growth
		EGRO	Trailing Earnings Growth
		SGRO	Sales Growth

In the following pages, we have provided details about each style factor. For each style factor, there are four plot diagrams that summarize factor risk and return performance in the univariate setting (agnostic to other risk model factors) and multivariate setting (in the presence of all factors) in the Barra US Total Market Equity Model for Long-Term Investors. The four factor plots are constructed as follows:

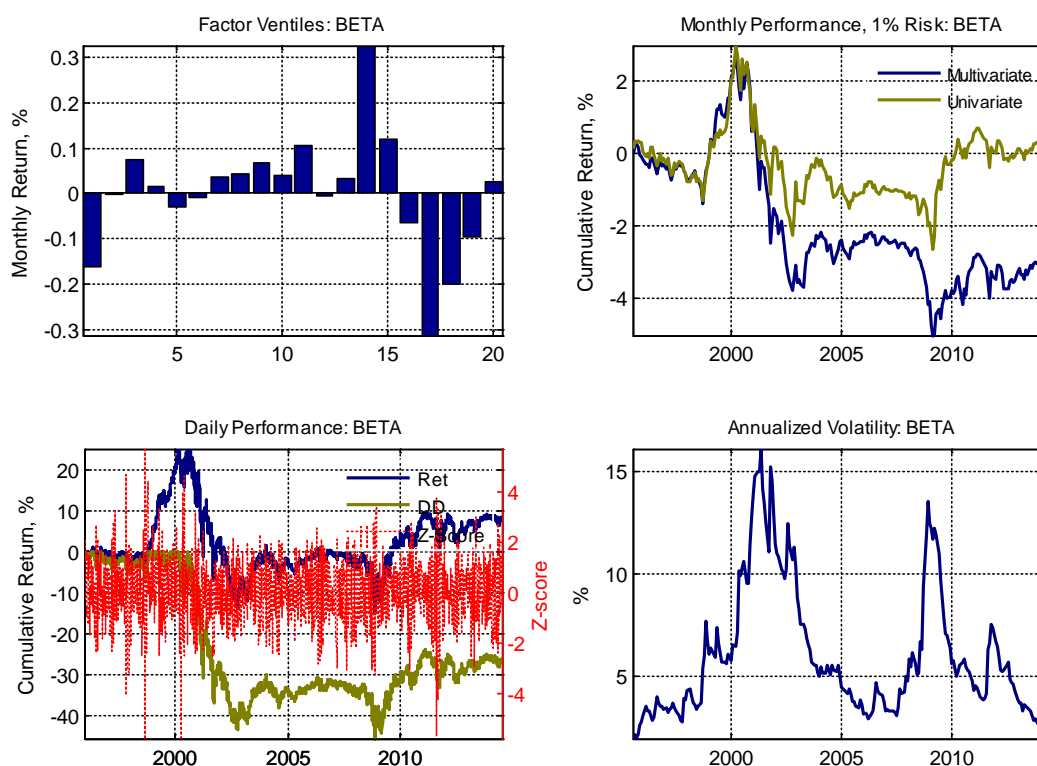
1. The **Factor Ventile** plot illustrates the performance of different stock segments grouped by their factor exposure. To construct Factor Ventile portfolios, we do the following:

- a. At each month-end, rank all the stocks in the estimation universe from smallest to largest, according to their factor exposure. Ranking stocks at each month-end corresponds to the monthly rebalancing of factor ventile portfolios.
  - b. Split stocks into 20 ventile portfolios so that each ventile portfolio contains 5% of stocks in the estimation universe. Ventile portfolio 1 has 5% of stocks with the lowest factor exposure, while ventile portfolio 20 has 5% of stocks with the highest factor exposure.
  - c. Compute the excess of market equal-weighted performance of all stocks in ventile portfolios. When computing market returns, we use the equal-weighted performance of all stocks in the estimation universe.
  - d. Plot the average excess of market monthly returns for each ventile portfolios.
2. The **Monthly Performance** plot illustrates historical univariate and multivariate factor performance using the monthly rebalance. Multivariate monthly performance is computed using monthly cross-sectional regressions in the Barra US Total Market Equity Model for Long-Term Investors and measures factor performance orthogonal to all factors in the risk model. Univariate monthly performance is computed as the return to a portfolio that goes long the top 2 ventile portfolios and goes short the bottom 2 ventile portfolios that are rebalanced monthly. Unlike factor portfolios in a multivariate setting, factor portfolios in a univariate setting may have exposure to other factors in the risk model.
  3. The **Daily Performance** plot illustrates: (i) historical multivariate performance using daily rebalancing, denoted "Ret", (ii) factor drawdown, denoted 'DD', and (iii) factor standardized weekly returns, denoted "Z-score". Multivariate daily performance is computed using daily cross-sectional regressions in the Barra US Long-Term Equity Model.
  4. The **Annualized Volatility** plot illustrates predicted annualized factor volatility using the Barra US Long-Term Equity Model.

## Beta

<b>Description</b>	Explains common variation in stock returns due to different stock sensitivities to market or systematic risk that cannot be explained by the US Country factor.
<b>Motivation</b>	The Capital Asset Pricing Model (CAPM), one of the workhorses of finance theory, describes the relationship between risk and expected return. One of the implications of the model is that one of the key determinants of an investor's required rate of return and stock risk is stock beta.
<b>Start Date</b>	30 June 1995
<b>Frequency</b>	Daily
<b>Exposure</b>	A positive exposure indicates a high beta stock.
<b>Interpretation</b>	A negative exposure indicates a low beta stock.
<b>Descriptors</b>	<ul style="list-style-type: none"> <li>Historical beta</li> </ul>

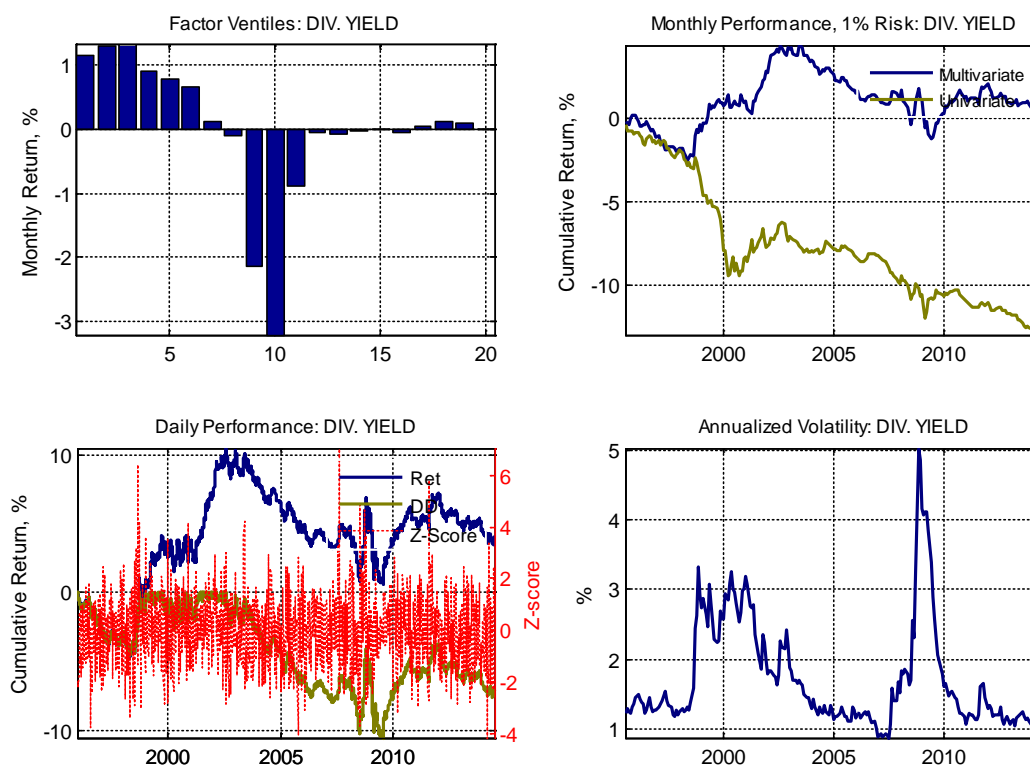
**Figure 1: Factor ventiles, monthly performance, daily performance and predicted annualized volatility for the Beta factor**



## Dividend Yield

<b>Description</b>	<p>Captures differences in stock returns attributable to stock's historical and predicted dividend-to-price ratios.</p> <p>This factor is based on Systematic Equity Strategies.</p>
<b>Motivation</b>	<p>Dividend is one of the central inputs in Gordon Growth Model for valuing a company's stock price. Rather than building a dividend-based structural model for valuation, we apply a relative valuation approach and use the Dividend Yield factor to capture common variation and risk differences between dividend paying companies.</p>
<b>Start Date</b>	30 June 1995
<b>Frequency</b>	Daily
<b>Exposure Interpretation</b>	<p>A positive exposure indicates a high historical/predicted dividend yield.</p> <p>A negative exposure indicates a low historical/predicted dividend yield.</p>
<b>Descriptors</b>	<ul style="list-style-type: none"> <li>• Historical dividend-to-price ratio</li> <li>• Analyst-predicted dividend-to-price ratio</li> </ul>

**Figure 2: Factor ventiles, monthly performance, daily performance and predicted annualized volatility for the Dividend Yield factor**



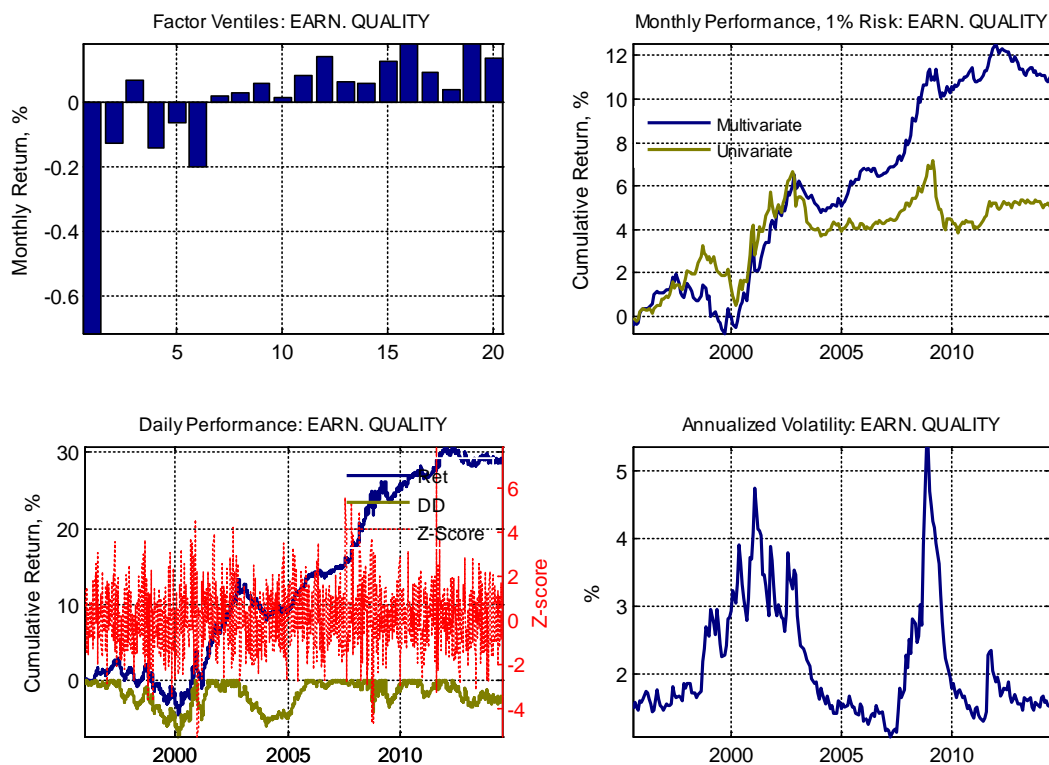
## Earnings Quality

<b>Description</b>	Explains stock return differences due to the uncertainty around company operating fundamentals (sales, earnings, cash flows) and the accrual components of their earnings.  This factor is based on Systematic Equity Strategies.
<b>Motivation</b>	In an influential paper, Sloan R. (1996) illustrates the importance of distinguishing persistent and non-persistent (accruals) components of company earnings in valuing companies. The accrual components of earnings involve significant management discretion and are more prone to manipulations. Typically, earnings growth driven by a large accrual component is seen as less “sustainable”, hence of “low quality”. Along with the measures of less persistent earnings component (accruals), we augment the Earnings Quality factor with the dispersion of historical earnings, cash flows, and sales, and the variability in analyst earnings estimates. Our motivation is that companies with higher earnings quality have less uncertainty around their fundamentals. <sup>1</sup>
<b>Start Date</b>	30 June 1995
<b>Frequency</b>	Daily
<b>Exposure Interpretation</b>	A positive exposure indicates a low accruals and low uncertainty around firm fundamentals. A negative exposure indicates a high accruals and high uncertainty around firm fundamentals.
<b>Descriptors</b>	<ul style="list-style-type: none"> <li>• Accruals using balance sheet statement</li> <li>• Accruals using cash-flow statement</li> <li>• Variability in sales</li> <li>• Variability in earnings</li> <li>• Variability in cash-flows</li> <li>• Variability in Analyst EPS Estimates to Price</li> </ul>

<sup>1</sup> For further reading, refer to:

Sloan R., 1996, Do Stock Prices Fully Reflect Information in Accruals and Cash Flows about Future Earnings? The Accounting Review  
Diether K.B., C.J. Malloy, 2002, Differences of Opinion and the Cross Section of Sock Returns, The Journal of Finance  
Francis J., R. LaFond, P. Olsson, K. Schipper, 2004, Cost of Equity and Earnings Attributes, The Accounting Review  
Huang, A.G., 2009, The cross section of cashflow volatility and expected stock returns. Journal of Empirical Finance

**Figure 3: Factor ventiles, monthly performance, daily performance and predicted annualized volatility for the Earnings Quality factor**



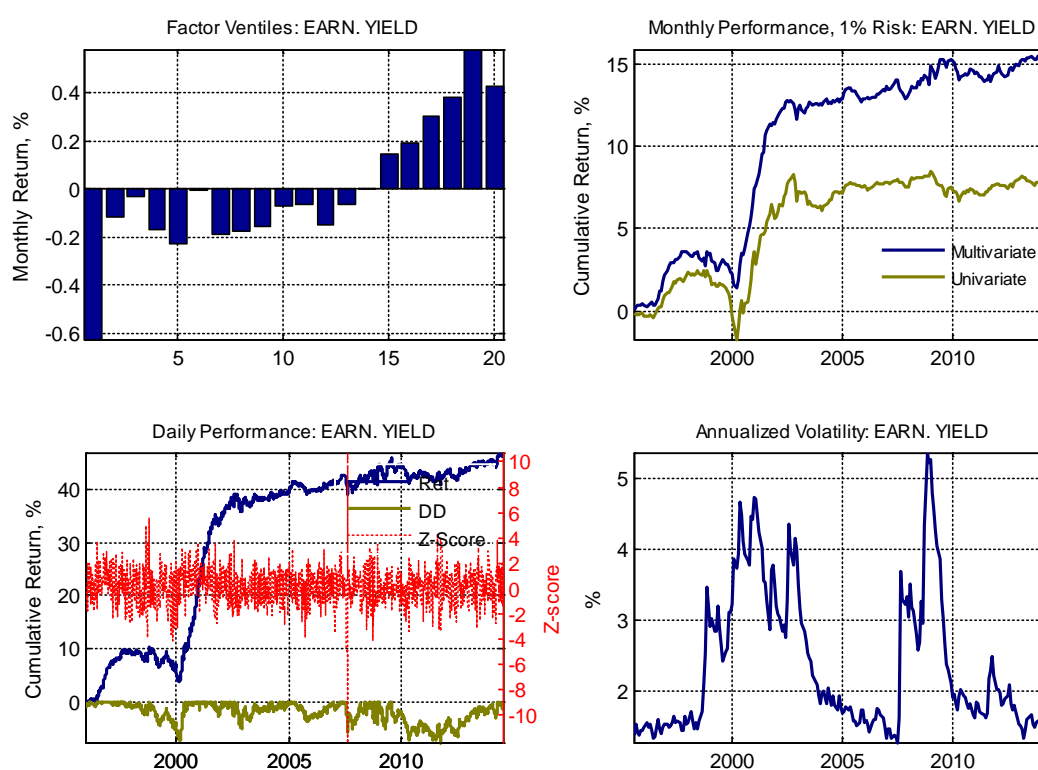
## Earnings Yield

<b>Description</b>	Describes stock return differences due to various ratios of the company's earnings relative to its price.  This factor is based on Systematic Equity Strategies.
<b>Motivation</b>	The Earnings Yield factor is one of the relative valuation multiples popular in the finance industry. Price multiples characterize a stock's relative "market" valuation and differ from multiples scaled by other metrics (such as assets, sales, or book value).  Most company valuations in the finance industry are relative valuations based on some company multiples and comparables. It is pointed out in academic literature that almost 85% of equity research reports and more than 50% of all acquisitions are based upon a company multiple.
<b>Start Date</b>	30 June 1995
<b>Frequency</b>	Daily



<b>Exposure Interpretation</b>	A positive exposure indicates a high historical/predicted earnings yield ('cheap' stocks) A negative exposure indicates a low historical/predicted earnings yield ('expensive' stocks)
<b>Descriptors</b>	<ul style="list-style-type: none"> <li>Enterprise multiple (EBITDA to EV)</li> <li>Trailing earnings-to-price ratio</li> <li>Analyst-predicted earnings-to-price ratio</li> </ul>

**Figure 4: Factor ventiles, monthly performance, daily performance and predicted annualized volatility for the Earning Yield factor**



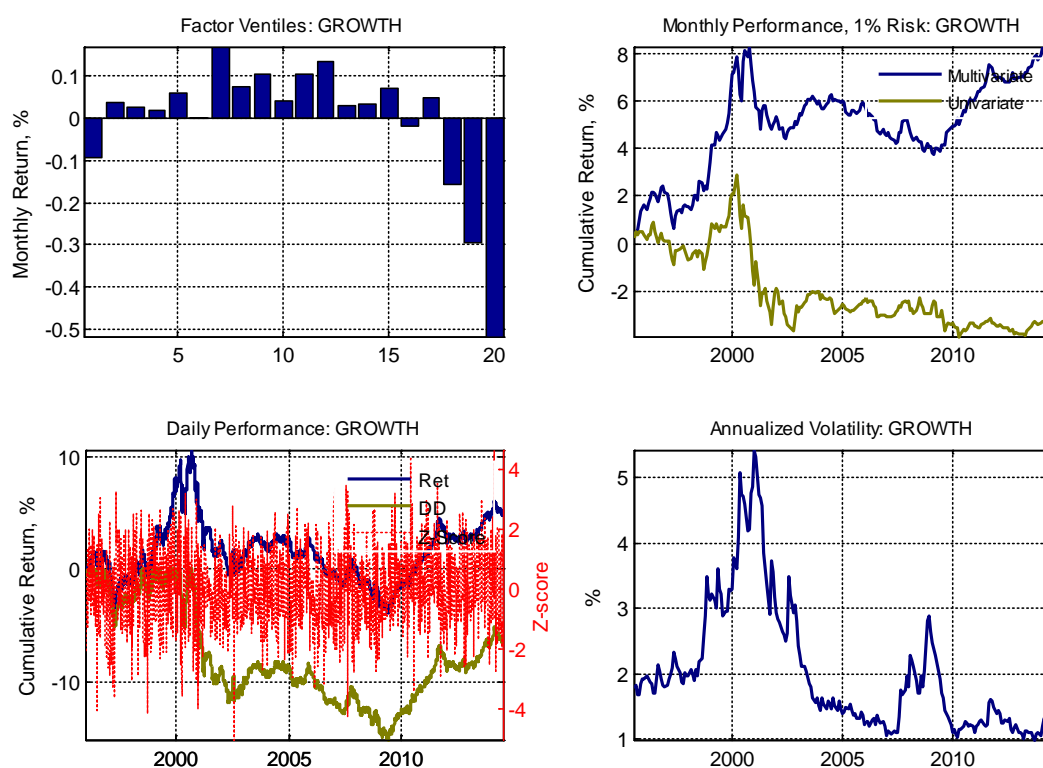
## Growth

<b>Description</b>	Measures company growth prospects using historical sales growth and historical and predicted earnings growth.  This factor is based on Systematic Equity Strategies.
<b>Motivation</b>	Growth is one of the factors that determines the future cash flow and dividends paid out to investors and, thus, future stock prices. The Gordon Growth Model, which is an example of the dividend discount model (DDM), for valuing a company's stock price is based on the net

present value of future dividends. The model predicts the relationship between stock price, future dividends, cost of capital and the dividend growth rate. We use the Growth factor in the risk model as a proxy for future dividend growth rate.

<b>Start Date</b>	30 June 1995
<b>Frequency</b>	Daily
<b>Exposure</b>	A positive exposure indicates a high historical/predicted growth.
<b>Interpretation</b>	A negative exposure indicates a low historical/predicted growth.
<b>Descriptors</b>	<ul style="list-style-type: none"> <li>• Long term analyst-predicted earnings per share growth</li> <li>• Historical earnings per share growth rate</li> <li>• Historical sales per share growth rate</li> </ul>

**Figure 5: Factor ventiles, monthly performance, daily performance and predicted annualized volatility for the Growth factor**

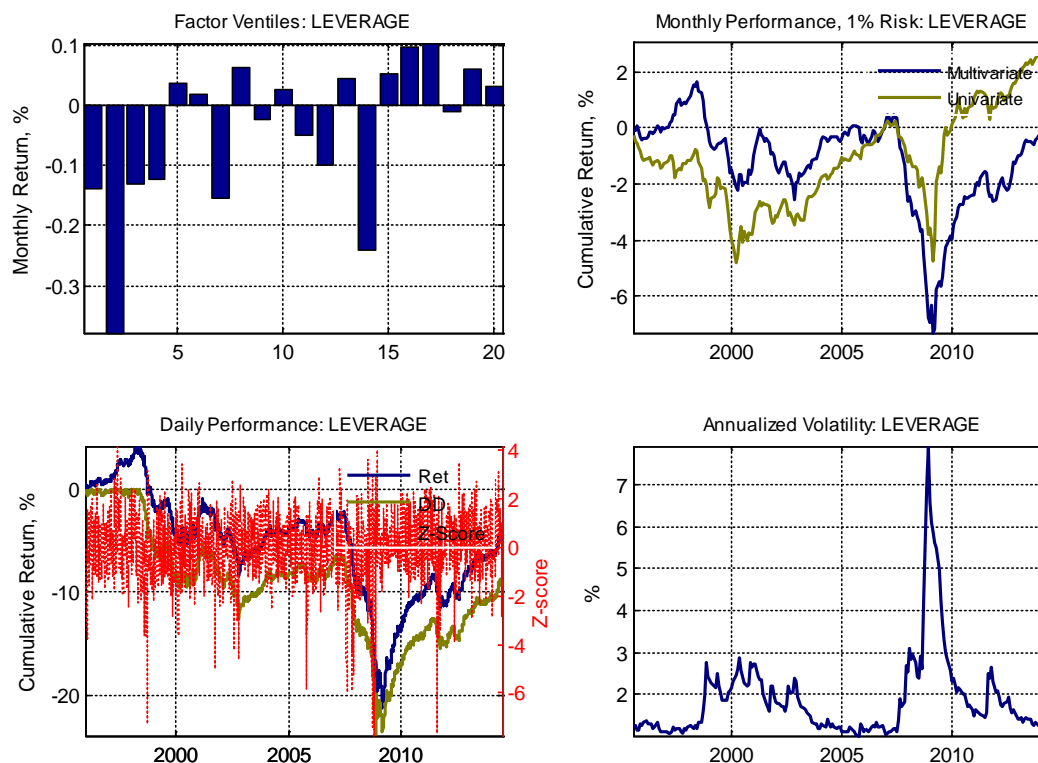


## Leverage

<b>Description</b>	Captures common variation in stock returns due to differences in the level of company leverage.
<b>Motivation</b>	We view highly-leveraged firms as riskier because they cannot change their production easily. In particular, they cannot scale down production during recessionary periods without increasing the probability of default. Highly-leveraged firms are saddled with too much capital during periods of low productivity and, relative to the low-leveraged firms, are more sensitive to interest rate shocks. <sup>2</sup>
<b>Type</b>	Fundamental
<b>Start Date</b>	30 June 1995
<b>Frequency</b>	Daily
<b>Exposure Interpretation</b>	A positive exposure indicates a high leverage. A negative exposure indicates a low leverage.
<b>Descriptors</b>	<ul style="list-style-type: none"> <li>• Market leverage</li> <li>• Book leverage</li> <li>• Debt-to-assets ratio</li> </ul>

<sup>2</sup> For further reading, refer to: Bhandari, 1988. Debt/Equity Ratio and Expected Common Stock Returns: Empirical Evidence, Journal of Finance

**Figure 6: Factor ventiles, monthly performance, daily performance and predicted annualized volatility for the Leverage factor**



## Liquidity

### Description

Captures common variations in stock returns due to the amount of relative trading and differences in the impact of trading on stock returns.

### Motivation

The ability of an investor to convert stock holdings into cash determines an illiquidity premium, that is, excess returns that investors require for holding difficult-to-sell illiquid stocks. The risk of holding illiquid stocks is that an investor may not be able to sell her holdings without incurring significant losses when she needs to raise cash. While volatility of highly-liquid stocks is primarily driven by changes in company fundamentals, volatility of illiquid stocks may be driven by company fundamentals as well as the investor's needs to raise cash by liquidating illiquid positions.<sup>3</sup>

<sup>3</sup> For further reading, refer to:

Amihud, 2002. Illiquidity and stock returns: Cross-section and time series effects. *Journal of Financial Markets* 5, 31-56

Pastor and Stambaugh, 2003. Liquidity risk and expected stock returns. *Journal of Political Economy*, 111(3), 642-685

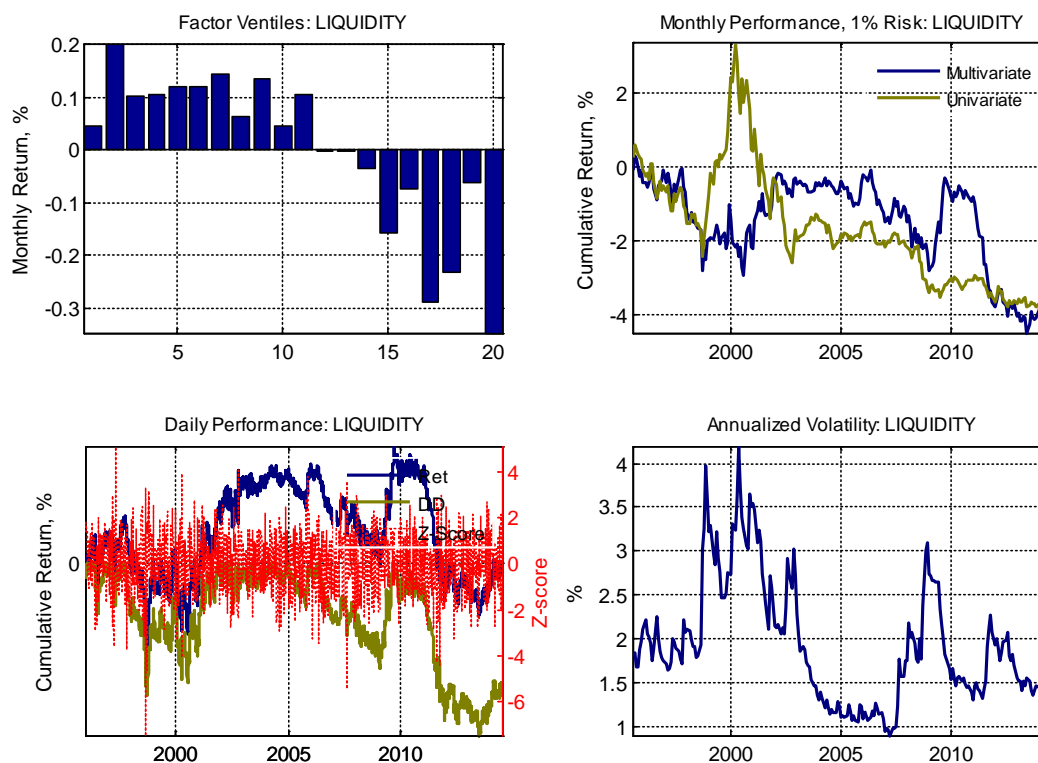
**Start Date** 30 June 1995

**Frequency** Daily

**Exposure Interpretation** A positive exposure indicates a high liquidity.  
A negative exposure indicates a low liquidity.

- Descriptors**
- Monthly share turnover
  - Quarterly share turnover
  - Annual share turnover
  - Modified Amihud illiquidity measure
  - Pastor-Stambaugh illiquidity measure

**Figure 7: Factor ventiles, monthly performance, daily performance and predicted annualized volatility for the Liquidity factor**



## Long-Term Reversal

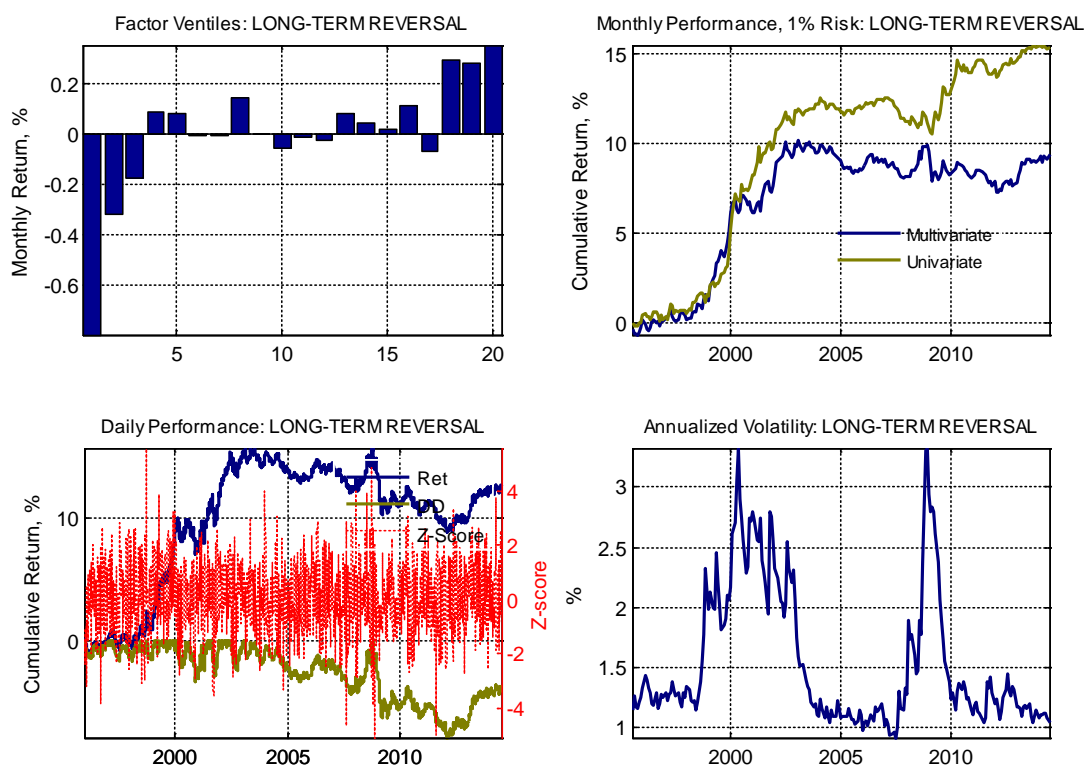
<b>Description</b>	Explains common variation in returns related to a long-term (five years ex. recent thirteen months) stock price behavior.  This factor is based on Systematic Equity Strategies.
<b>Motivation</b>	The early evidence for long-term reversal phenomena in stock returns goes back to De Bondt and Thaler (1985). Our own research illustrates that actively managed US mutual funds have significant exposure to this factor. <sup>4</sup>
<b>Start Date</b>	30 June 1995
<b>Frequency</b>	Daily
<b>Exposure Interpretation</b>	A positive exposure indicates a low long-term momentum (poor long-term performance ex. recent performance).  A negative exposure indicates a high long-term momentum (good long-term performance ex. recent performance).
<b>Descriptors</b>	<ul style="list-style-type: none"> <li>• Long-term relative strength</li> <li>• Long-term historical alpha</li> </ul>

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<sup>4</sup> For further reading, refer to:

De Bondt and Thaler, 1985. Does the Stock Market Overreact? Journal of Finance, Volume 40, Issue 3

**Figure 8: Factor ventiles, monthly performance, daily performance and predicted annualized volatility for the Long-Term Reversal factor**



## Management Quality

<b>Description</b>	<p>A combination of asset, investment, net issuance growth measures that captures common variation in stock returns of companies experiencing rapid growth or contraction of assets.</p> <p>This factor is based on Systematic Equity Strategies.</p>
<b>Motivation</b>	<p>There is evidence that companies with corporate events associated with asset expansion (that is, acquisitions, public equity offering, etc.) tend to experience lower returns than companies with corporate events associated with asset contraction (that is, spinoff, share repurchase, etc.). These findings suggest that investors may have a bias in the capitalization of company asset investments and disinvestment decisions. Related to these findings, there is evidence that management tends to issue or repurchase shares when the company is overvalued or undervalued, and investors underreact to that information. Also, high capital expenditures and asset growth are associated with the phenomenon of “empire building” that has a negative impact on company future performance.<sup>5</sup></p>
<b>Start Date</b>	30 June 1995
<b>Frequency</b>	Daily
<b>Exposure Interpretation</b>	<p>A positive exposure indicates low asset and capital expenditure growth and low net equity issuance.</p> <p>A negative exposure indicates high asset and capital expenditure growth and high net equity issuance.</p>
<b>Descriptors</b>	<ul style="list-style-type: none"> <li>• Asset growth</li> <li>• Issuance growth</li> <li>• Capital expenditure growth</li> <li>• Capital expenditure</li> </ul>

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<sup>5</sup> For further reading, refer to:

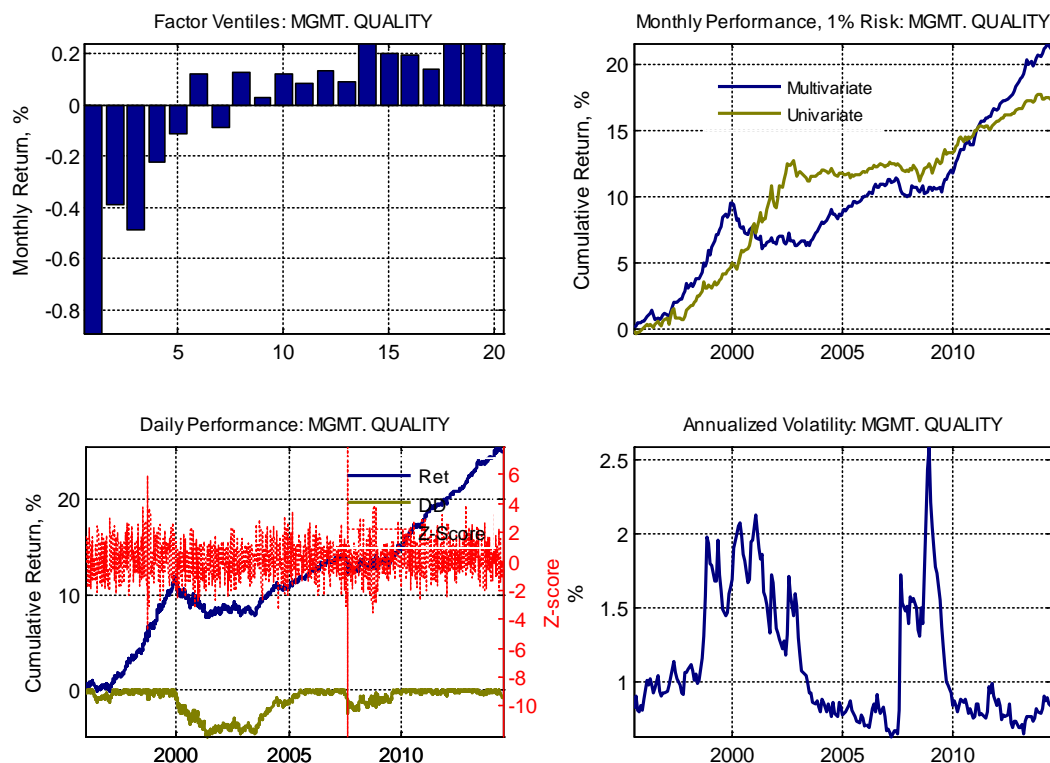
Cooper, M. J., H. Gulen, M. J. Schill, 2008, Asset Growth and the Cross-Section of Stock Returns, The Journal of Finance

Abarbanell J. S., B. J. Bushee, 1998, Abnormal Returns to a Fundamental Analysis Strategy, The Accounting Review

Pontiff J., A. Woodgate, 2008, Share Issuance and Cross-sectional Returns, The Journal of Finance



**Figure 9: Factor ventiles, monthly performance, daily performance and predicted annualized volatility for the Management Quality factor**



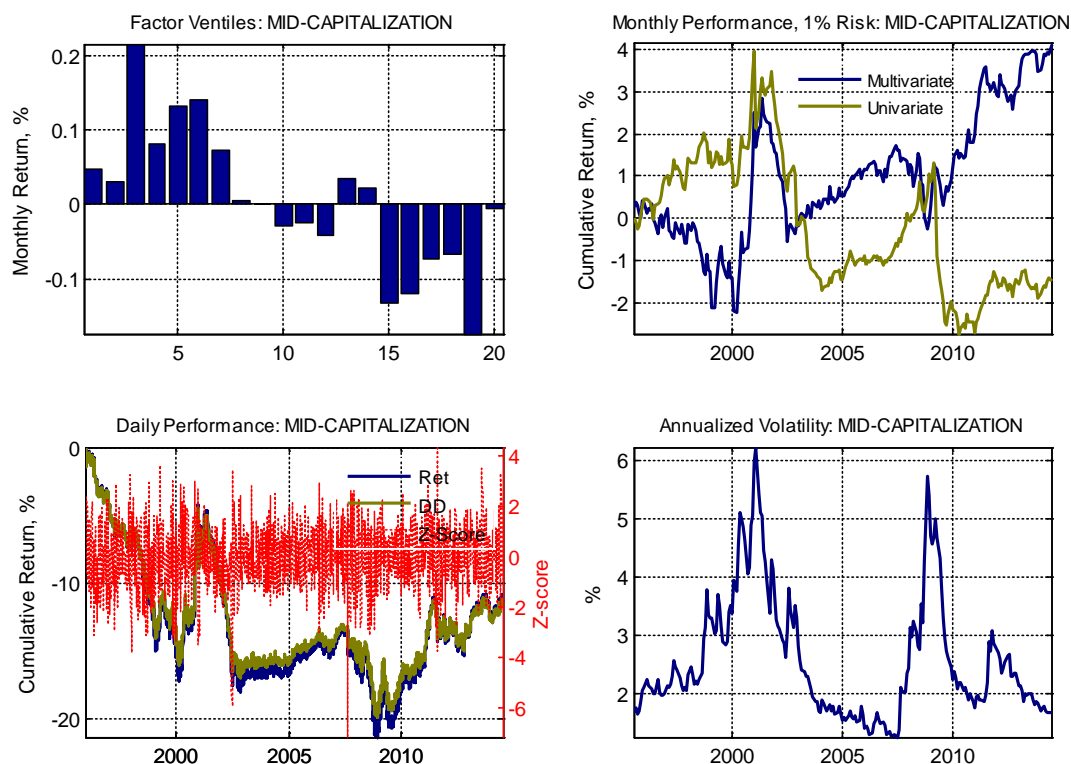
## Mid Capitalization

<b>Description</b>	Captures deviations from linearity in the relationship between returns and the logarithm of market capitalization (Size factor). This factor explains differences in risk and return for mid-capitalization stocks from small-cap and large-cap stocks.
<b>Motivation</b>	A closer look at the relationship between company stock returns or risk and the company log of market capitalization reveals deviations from a linear relationship. In particular, a change in expected returns and risk tends to increase more rapidly than implied by a linear model as we move from large-capitalization companies to small-capitalization companies. To capture this non-linear relationship in a linear factor framework, we introduced the Mid Capitalization factor.
<b>Start Date</b>	30 June 1995
<b>Frequency</b>	Daily
<b>Exposure</b>	A positive exposure indicates mid capitalization.

**Interpretation** A negative exposure indicates the large and small capitalization.

**Descriptors** • Cube of size exposure

**Figure 10: Factor ventiles, monthly performance, daily performance and predicted annualized volatility for the Mid Capitalization factor**



## Momentum

**Description** Explains common variation in stock returns related to recent (twelve months) stock price behavior.

This factor is based on Systematic Equity Strategies.

**Motivation** The importance of the Momentum factor in explaining stock return differences is well established in academia. A variant of the Momentum factor, called Success, was introduced in a previous Barra US equity model developed in the 1980s. The Momentum factor is one of the factors often added to the popular Fama-French Three-Factor Model. The Momentum factor phenomenon spurred a number of often-opposing models trying to explain common variation

in stock returns and risk.

**Start Date** 30 June 1995

**Frequency** Daily

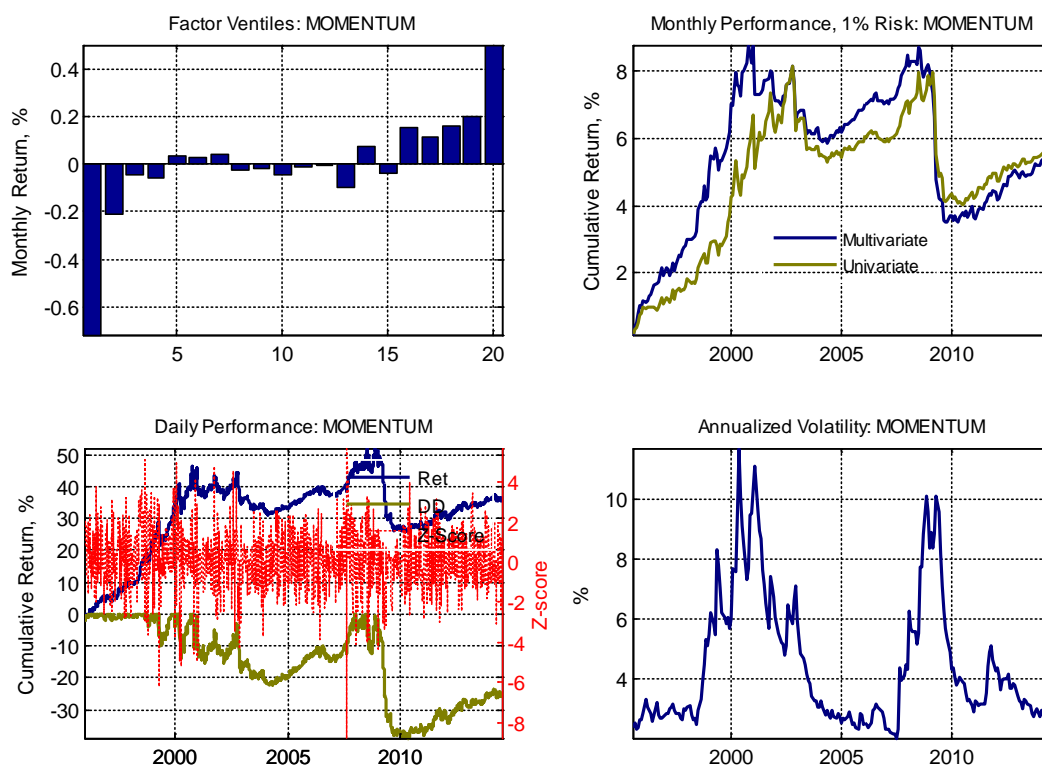
**Exposure** A positive exposure indicates a high medium-term momentum (good recent performance).

**Interpretation** A negative exposure indicates a low medium-term momentum (poor recent performance).

**Descriptors**

- Relative strength

**Figure 11: Factor ventiles, monthly performance, daily performance and predicted annualized volatility for the Momentum factor**



## Profitability

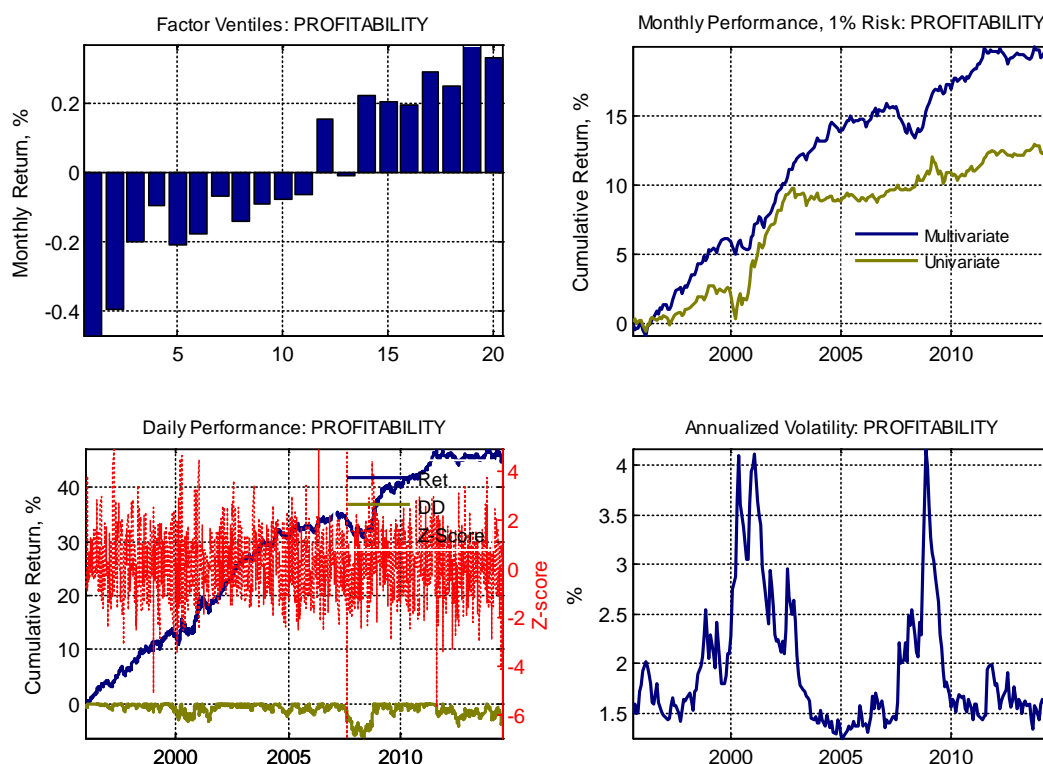
<b>Description</b>	<p>A combination of profitability measures that characterizes efficiency of a firm's operations and total activities.</p> <p>This factor is based on Systematic Equity Strategies.</p>
<b>Motivation</b>	<p>From an academic point of view, the importance of profitability may be demonstrated by using the dividend discount model (DDM). Under some simplifying assumptions, the dividend discount model implies that higher expected future earnings imply a higher expected stock return. Following recent academic research, we use profitability measures as a proxy for future expected earnings.<sup>6</sup></p>
<b>Start Date</b>	30 June 1995
<b>Frequency</b>	Daily
<b>Exposure Interpretation</b>	<p>A positive exposure indicates a high profitability and operating efficiency.</p> <p>A negative exposure indicates a low profitability and operating efficiency.</p>
<b>Descriptors</b>	<ul style="list-style-type: none"> <li>• Asset turnover</li> <li>• Gross profitability</li> <li>• Gross margin</li> <li>• Return on assets</li> <li>• Return on equity</li> </ul>

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<sup>6</sup> For further reading, refer to:

Novy-Marx, 2013. The other side of value: The gross profitability premium. Journal of Financial Economics 108(1), 1-28

**Figure 12: Factor ventiles, monthly performance, daily performance and predicted annualized volatility for the Profitability factor**



## Prospect

<b>Description</b>	<p>Explains common variation in stock returns that have exhibited a lottery-like behavior identified through a combination of stock return skewness over a long horizon and drawdown in returns over the recent period.</p> <p>This factor is based on Systematic Equity Strategies.</p>
<b>Motivation</b>	<p>The Prospect factor is motivated by the cumulative prospect theory that implies that a security's own skewness may be prices. In particular, companies with positively-skewed returns may be overpriced and have low excess stock returns relative to stocks with negatively-skewed returns.<sup>7</sup> Stocks with positive skewness means its historical return distribution (5 year daily) have a longer right tail, exhibit strong lottery like behaviors, tend to</p>

<sup>7</sup> For further reading, refer to:

Barberis and Huang, 2008. Stock as lotteries: The implications of probability weighting for security prices. AER, 98(5), 2066-2100  
Boyer, Mitton, Vorkink, 2010. Expected idiosyncratic skewness. RFS, 23(1), 169-202

be over-bought by investors, and experience a lower than average realized returns

**Start Date** 30 June 1995

**Frequency** Daily

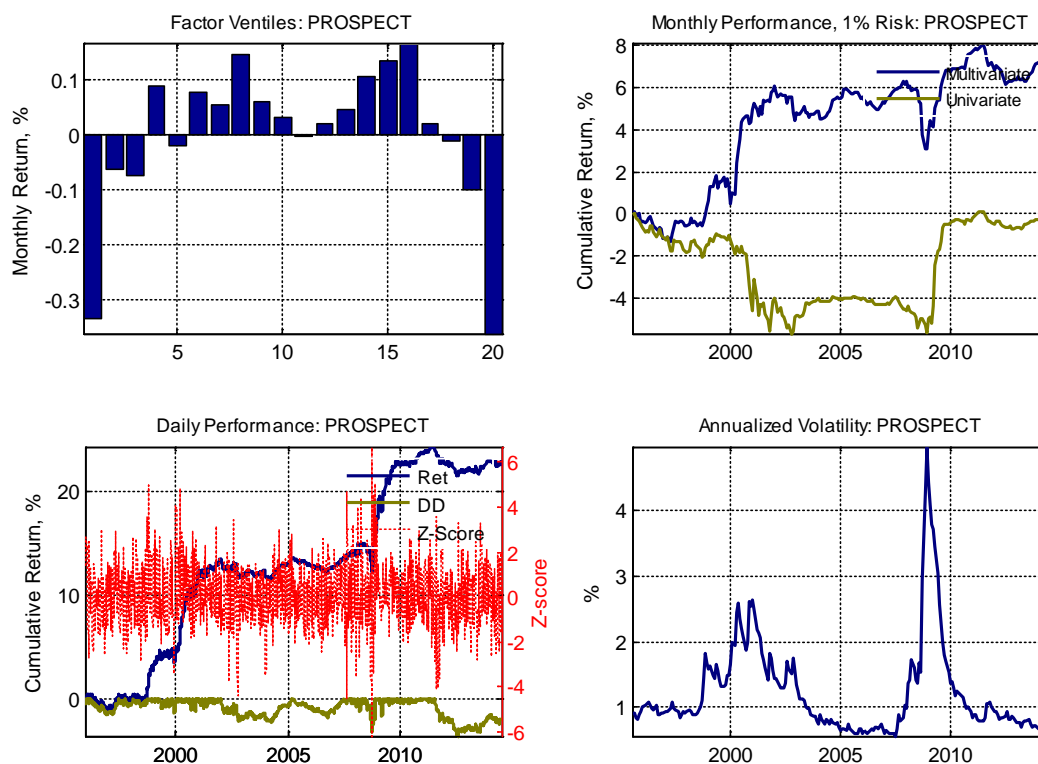
**Exposure Interpretation** A positive exposure indicates a left skew in returns (large negative returns) and large drawdowns in recent performance.

A negative exposure indicates a right skew in returns (large positive returns) and low drawdowns in recent performance.

**Descriptors**

- Skewness
- Maximum drawdown

**Figure 13: Factor ventiles, monthly performance, daily performance and predicted annualized volatility for the Prospect factor**



## Residual Volatility

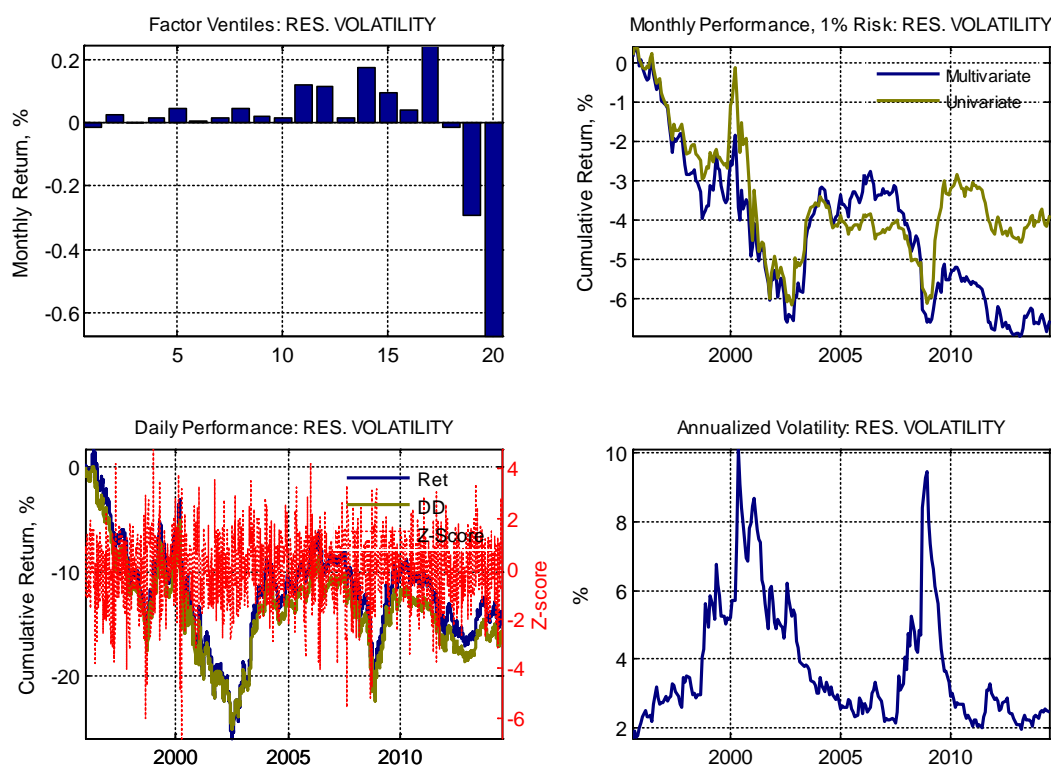
**Description** Captures relative volatility in stock returns that is not explained by differences in stock sensitivities to market returns (Country and Beta factors).

**Motivation** There is a persuasive evidence that stocks with high residual (idiosyncratic) volatility relative to

the Capital Asset Pricing Model (CAPM) or Fama-French Three-Factor Model have unexpectedly low average returns. We include the Residual Volatility factor to capture this pervasive phenomenon.<sup>8</sup>

<b>Start Date</b>	30 June 1995
<b>Frequency</b>	Daily
<b>Exposure</b>	A positive exposure indicates a high residual volatility.
<b>Interpretation</b>	A negative exposure indicates a low residual volatility.
<b>Descriptors</b>	<ul style="list-style-type: none"> <li>• Historical sigma</li> <li>• Volatility implied by call options</li> <li>• Volatility implied by put options</li> </ul>

**Figure 14: Factor ventiles, monthly performance, daily performance and predicted annualized volatility for the Residual Volatility factor**



<sup>8</sup> For further reading, refer to:

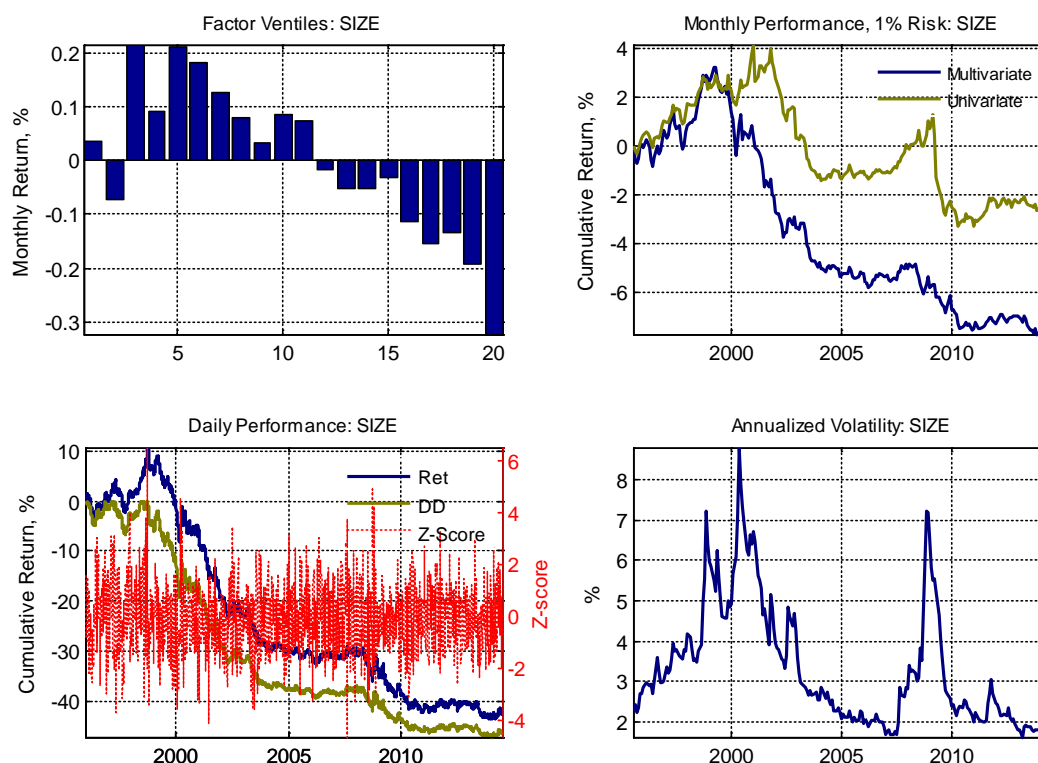
Ang, Hodrick, Xing, Zhang, 2006. The cross-section of volatility and expected returns. JF 61, 259-299

Bali, Cakici, 2008. Idiosyncratic volatility and the cross section of expected returns. JFQA 43(1), 29-58

## Size

<b>Description</b>	Captures differences in stock returns and risk due to differences in of the market capitalization of companies.
<b>Motivation</b>	The importance of the Size factor in predicting the cross-section of stock returns has a long history in Barra modelling and academic literature. Also, the Size factor is one of the factors in Fama-French Three-Factor Model. There is consensus that there are significant differences in the behavior of risk and returns of large-capitalization and small-capitalization companies. Historically, small-capitalization companies earned higher returns realizing a higher volatility.
<b>Start Date</b>	30 June 1995
<b>Frequency</b>	Daily
<b>Exposure Interpretation</b>	A positive exposure indicates large capitalization. A negative exposure indicates small capitalization.
<b>Descriptors</b>	Logarithm of market capitalization

**Figure 15: Factor ventiles, monthly performance, daily performance and predicted annualized volatility for the Size factor**





## Value

<b>Description</b>	<p>Captures the extent to which a company is overpriced or underpriced using a combination of several relative valuation metrics and one structural valuation factor.</p> <p>This factor is based on Systematic Equity Strategies.</p>
<b>Motivation</b>	<p>The Value factor is a combination of relative valuation multiples popular in the finance industry. The role of the Value factor in explaining stock return and risk differences has also a long history in Barra modelling and academic literature. Barra had the Value factor in its first US equity model developed in the 1970s. Also, the Value factor is one of the factors in the Fama-French Three-Factor Model. Historically, high-value companies earned higher returns and experienced higher risk relative to low-value companies.<sup>9</sup></p>
<b>Start Date</b>	30 June 1995
<b>Frequency</b>	Daily
<b>Exposure Interpretation</b>	<p>A positive exposure indicates a high value (“cheap”).</p> <p>A negative exposure indicates a low value (“expensive”).</p>
<b>Descriptors</b>	<ul style="list-style-type: none"> <li>• Book-to-price ratio</li> <li>• Sales-to-price ratio</li> <li>• Cash-flow to price ratio</li> <li>• Structural valuation factor</li> </ul>

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<sup>9</sup> For further reading, refer to:

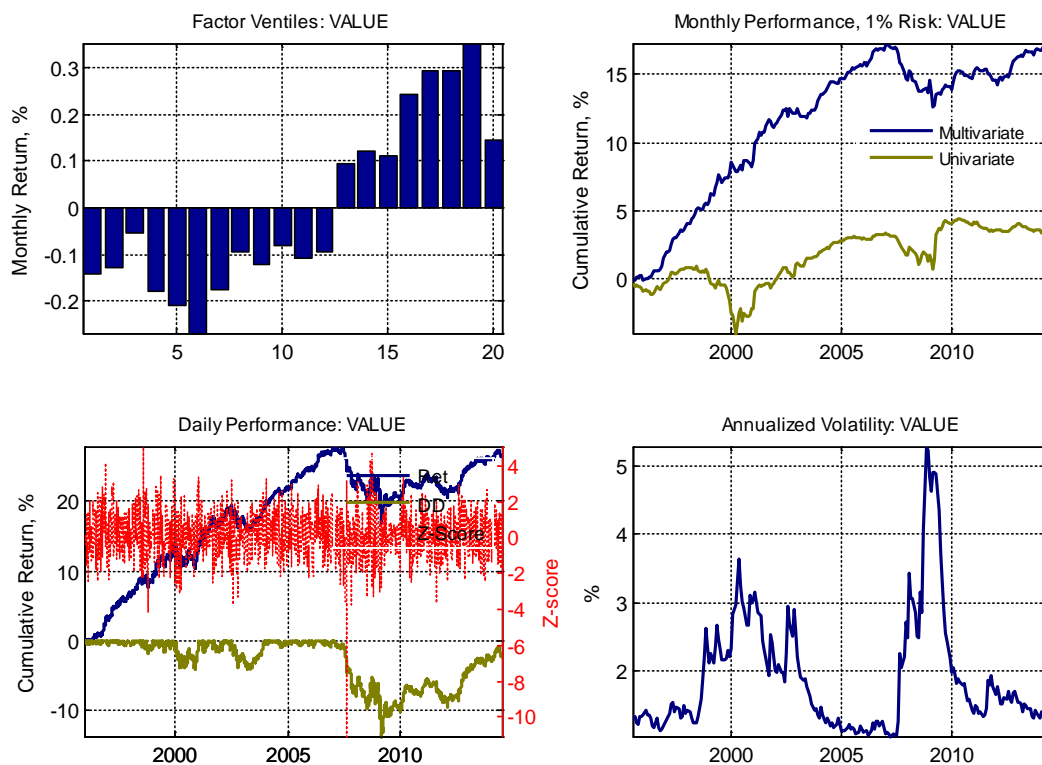
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Lyle and Wang, 2013. The Cross section of expected holding period returns and their dynamics: A present value approach. JFE, forthcoming

Figure 16: Factor ventiles, monthly performance, daily performance and predicted annualized volatility for the Value factor



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