

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

## Datasheet

Model Summary	Model Advances
<p>Asset Coverage: 19700+<sup>1</sup></p> <p>Style Factors: 16</p> <p>Industry Factors: 60</p> <p>Country Factor: 1</p>	<ul style="list-style-type: none"> <li>Enhanced style factors based on Systematic Equity Strategies. Introduces new factors based on Management Quality, Profitability, Prospect, Long-Term Reversal, and Earnings Quality.</li> <li>Factors based on premier datasets from MSCI's comprehensive database and additional leading quantitative data sources.</li> <li>Factor structure and responsiveness aligned with an investment horizon of over six months. Available in Stable and Responsive variants.</li> <li>Broad coverage of stocks, cross-listed securities, and Depository Receipts.</li> <li>Volatility Regime Adjustment for more timely and accurate response to sudden changes in market volatility.</li> <li>Optimization Bias Adjustment to reduce biases in risk forecasts for optimized portfolios.</li> <li>Full daily history and updates of the model.</li> <li>A specific risk model combining structural and time series components. Improved risk forecasts through Volatility Regime Adjustment and Bayesian Adjustment.</li> </ul>

Model Attributes	Details																		
Application Usage	Barra Aegis Barra Portfolio Manager Models Direct																		
Model Start Dates	Barra Aegis: 30 June 1995 Barra Portfolio Manager: 30 June 1995 Models Direct: 30 June 1995																		
Estimation Universe	MSCI USA IMI (US component of MSCI All Country World Investable Market Index (ACWI IMI))																		
Regression Weighting Scheme	Square root of market capitalization																		
Factor Covariance Matrix: Half-life	<table border="1"> <thead> <tr> <th></th> <th>Stable Variant</th> <th>Responsive Variant</th> </tr> </thead> <tbody> <tr> <td>Half-life for Volatility</td> <td>252 days</td> <td>84 days</td> </tr> <tr> <td>Newey-West Volatility Lags</td> <td>10 days</td> <td>10 days</td> </tr> <tr> <td>Half-life for Correlations</td> <td>756 days</td> <td>504 days</td> </tr> <tr> <td>Newey-West Correlation Lags</td> <td>4 days</td> <td>4 days</td> </tr> <tr> <td>Half-life for Volatility Regime Adjustment</td> <td>N/A</td> <td>21 days</td> </tr> </tbody> </table>		Stable Variant	Responsive Variant	Half-life for Volatility	252 days	84 days	Newey-West Volatility Lags	10 days	10 days	Half-life for Correlations	756 days	504 days	Newey-West Correlation Lags	4 days	4 days	Half-life for Volatility Regime Adjustment	N/A	21 days
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<sup>1</sup> As of 31 Jul 2014

Specific Risk: Half-life	Stable Variant	Responsive Variant	
	Half-life for Specific Volatility	252 days	84 days
	Newey-West Auto-Correlation Lags	5 days	5 days
	Newey-West Auto-Correlation Half-Life	252 days	252 days
	Bayesian Shrinkage Parameter	0.05	0.05
	Half-life for Volatility Regime Adjustment	N/A	42 days
	Linked Specific Risk available	Yes	Yes
Industry Allocation Scheme	Multiple-industry allocation (up to five industries)		
Source of Industry Scheme	Based on Global Industry Classification Standard (GICS®)		
Model Base Currency	USD		

Style Factors	Purpose	Descriptors
Beta	Explains common variations in stock returns due to different stock sensitivities to market or systematic risk that cannot be explained by the US Country factor.	<ul style="list-style-type: none"> <li>Historical beta</li> </ul>
Dividend Yield	Captures differences in stock returns attributable to stock's historical and predicted dividend-to-price ratios.	<ul style="list-style-type: none"> <li>Historical dividend-to-price ratio</li> <li>Analyst-predicted dividend-to-price ratio</li> </ul>
Earnings Quality	Explains stock return differences due to uncertainty around company operating fundamentals (sales, earnings, cash flows) and the accrual components of their earnings.	<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 of analyst EPS estimates to price</li> </ul>
Earnings Yield	Describes stock return differences due to various ratios of the company's earnings relative to its price.	<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>
Growth	Measures company growth prospects using historical sales growth and historical and predicted earnings growth.	<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>
Leverage	Captures common variation in stock returns due to differences in the level of company leverage.	<ul style="list-style-type: none"> <li>Market leverage</li> <li>Book leverage</li> <li>Debt-to-assets ratio</li> </ul>
Liquidity	Captures common variations in stock returns due to the amount of relative trading and differences in the impact of trading on stock returns.	<ul style="list-style-type: none"> <li>Monthly share turnover</li> <li>Quarterly share turnover</li> <li>Annual share turnover</li> <li>Modified Amihud illiquidity measure</li> <li>Pastor-Stambaugh illiquidity measure</li> </ul>

Long-Term Reversal	Explains common variation in returns related to a long-term (five years ex. recent thirteen months) stock price behavior.	<ul style="list-style-type: none"> <li>• Long-term relative strength</li> <li>• Long-term historical alpha</li> </ul>
Management Quality	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.	<ul style="list-style-type: none"> <li>• Asset growth</li> <li>• Issuance growth</li> <li>• Capital expenditure growth</li> <li>• Capital expenditure</li> </ul>
Mid Capitalization	Explains the returns of mid-cap stocks relative to large and small-cap stocks by capturing deviations from linearity in the relationship between returns and the Size factor.	<ul style="list-style-type: none"> <li>• Cube of the Size Exposure</li> </ul>
Momentum	Explains common variation in stock returns related to recent (twelve months) stock price behavior.	<ul style="list-style-type: none"> <li>• Relative strength</li> </ul>
Profitability	A combination of profitability measures that characterizes efficiency of a firm's operations and total activities.	<ul style="list-style-type: none"> <li>• Return on assets</li> <li>• Return on equity</li> <li>• Gross profitability</li> <li>• Gross margin</li> <li>• Asset turnover</li> </ul>
Prospect	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.	<ul style="list-style-type: none"> <li>• Skewness</li> <li>• Maximum drawdown</li> </ul>
Residual Volatility	Captures relative volatility in stock returns that is not explained by differences in stock sensitivities to market returns.	<ul style="list-style-type: none"> <li>• Historical sigma</li> <li>• Volatility implied by one month call option<sup>2</sup></li> <li>• Volatility implied by three month call option<sup>3</sup></li> <li>• Volatility implied by one month put option<sup>4</sup></li> <li>• Volatility implied by three month put option<sup>5</sup></li> </ul>
Size	Captures differences in stock returns and risk due to differences in the market capitalization of companies.	<ul style="list-style-type: none"> <li>• Logarithm of market capitalization</li> </ul>
Value	Captures the extent to which a company is overpriced or underpriced using a combination of several relative valuation metrics and one structural valuation factor.	<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>

<sup>2</sup> 1-month at-the-money call option

<sup>3</sup> 3-month at-the-money call option

<sup>4</sup> 1-month put option

<sup>5</sup> 3-month put option

**Industry Factors**

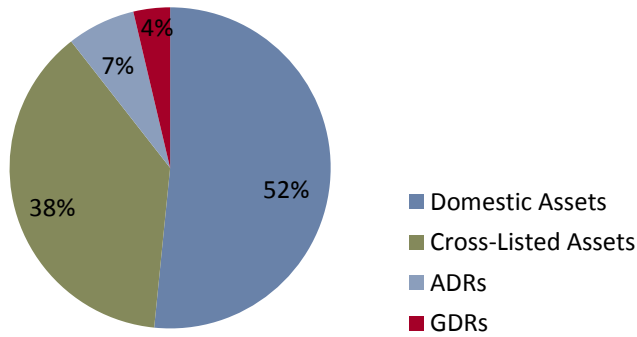
- |  |  |
|--|--|
| 1. Oil and Gas Drilling                          | 31. Distributors Multiline Retail          |
| 2. Oil and Gas Equipment and Services            | 32. Internet and Catalog Retail            |
| 3. Oil and Gas Exploration and Production        | 33. Apparel and Textiles                   |
| 4. Oil Gas and Consumable Fuels                  | 34. Specialty Stores                       |
| 5. Chemicals                                     | 35. Specialty Retail                       |
| 6. Specialty Chemicals                           | 36. Household and Personal Products        |
| 7. Construction Materials                        | 37. Food and Staples Retailing             |
| 8. Containers and Packaging                      | 38. Food Products                          |
| 9. Paper and Forest Products                     | 39. Beverages Tobacco                      |
| 10. Aluminum Steel                               | 40. Health Care Equipment and Technology   |
| 11. Precious Metals Gold Mining                  | 41. Managed Health Care                    |
| 12. Aerospace and Defense                        | 42. Health Care Providers (non-HMO)        |
| 13. Construction and Farm Machinery              | 43. Biotechnology Life Sciences            |
| 14. Industrial Machinery                         | 44. Pharmaceuticals                        |
| 15. Building Products                            | 45. Banks                                  |
| 16. Trading Companies and Distributors           | 46. Diversified Financials                 |
| 17. Construction and Engineering                 | 47. Life Health and Multi-line Insurance   |
| 18. Electrical Equipment                         | 48. Insurance Brokers and Reinsurance      |
| 19. Industrial Conglomerates                     | 49. Real Estate                            |
| 20. Commercial and Professional Services         | 50. Semiconductor Equipment                |
| 21. Airlines                                     | 51. Semiconductors                         |
| 22. Transportation Air Freight and Marine        | 52. Internet Software and IT Services      |
| 23. Road and Rail                                | 53. Software                               |
| 24. Automobiles and Components                   | 54. Communications Equipment               |
| 25. Household Durables (non-Homebuilding)        | 55. Computers Electronics                  |
| 26. Homebuilding                                 | 56. Diversified Telecommunication Services |
| 27. Leisure Products Textiles Apparel and Luxury | 57. Wireless Telecommunication Services    |
| 28. Hotels Leisure and Consumer Services         | 58. Electric Utilities                     |
| 29. Restaurants                                  | 59. Gas Utilities                          |
| 30. Media  | 60. Multi-Utilities Water Utilities Power  |

**Country Factor**

US Country

**Model Coverage**

- Total 19700+ assets as of 31 Jul 2014
  - +10000 domestic stocks, including +5700 OTC listings
  - From NYSE, NASDAQ, and American Stock Exchange. Also includes Pink Sheets and OTC markets
  - The model also covers over 370 ETFs



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<sup>1</sup> As of June 30, 2014, as reported on September 30 2014 by eVestment, Morningstar and Bloomberg