

Datasheet - Barra China A Total Market Equity Model for Long Term Investors

August 2018

Model Summary	Model Advances
<p>Asset Coverage: 5489¹</p> <p>Style Factors: 16</p> <p>Industry Factors: 32</p> <p>Market Factor: 1</p>	<ul style="list-style-type: none"> • Robust specific risk model that combines structural and time series components, based on daily asset-level returns. • Broad coverage of the China domestic market including Stock Connect listings and full coverage of major indexes. • Enhanced style factors based on Systematic Equity Strategies. • Separation of industry and market effects through a Market factor improves forecasting accuracy. • Point-in-time fundamental data to reduce forward bias in backtesting. • Enhanced beta estimation with Bayesian shrinkage towards industry betas. • Volatility Regime Adjustment for more timely and accurate response to sudden changes in market volatility. • Optimization Bias Adjustment to reduce biases in risk forecasts for optimized portfolios. • Alignment of the factor structure and responsiveness with an investment horizon of over six months. Available in Stable and Responsive variants. • Full daily history and updates of the model.

¹ As of May 2, 2018

Model Attributes	Details		
Application Usage	Barra Aegis Barra PortfolioManager Barra Models Direct		
Model Start Dates	Barra Aegis: Dec 31, 1998 Barra PortfolioManager: Dec 31, 1998 Barra Models Direct: Dec 31, 1998		
Estimation Universe	China component of MSCI All Country World Investable Market Index (ACWI IMI) - before June 2008 MSCI China A Onshore IMI - after June 2008		
Regression Weighting Scheme	Square root of market capitalization		
Factor Covariance Matrix: Half-life		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	5 days	3 days
	Half-life for Volatility Regime Adjustment	84 days	21 days
Specific Risk:		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	0.15	0.15
	Half-life for Volatility Regime Adjustment	84 days	21 days
	Linked Specific Risk available	Yes	Yes
Industry Allocation Scheme	Single-industry allocation		
Source of Industry Scheme	Based on Global Industry Classification Standard (GICS®)		
Model Base Currency	CNY		

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 Country factor	<ul style="list-style-type: none"> Historical Beta
Book-to-Price	Calculated as the last reported book value of common equity divided by current market capitalization	<ul style="list-style-type: none"> Book-to-Price
Dividend Yield	Captures differences in stock returns attributable to stock's trailing 12-month and predicted dividend-to-price ratios	<ul style="list-style-type: none"> Analyst Predicted Dividend-to-Price Dividend-to-Price
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"> Accruals - Balance Sheet Version Accruals - Cash flow Statement Version
Earnings Variability	Explains stock return differences due to variability in earnings and cash flows using both historical measures and analysts' forecasts	<ul style="list-style-type: none"> Standard Deviation of Analyst Forecast Earnings-to-Price Variability in Cash flows Variability in Earnings Variability in Sales
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"> Analyst-predicted Earnings-to-Price Cash Earnings-to-Price Earnings-to-Price Enterprise Multiple (EBIT to EV)
Growth	Measures company growth prospects using sales growth and earnings growth over trailing five years and predicted earnings growth	<ul style="list-style-type: none"> Analyst Predicted Earnings Long-term Growth Earnings per Share Growth Rate Sales per Share Growth Rate
Investment Quality	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"> Capital Expenditure Growth Issuance Growth Total Assets Growth Rate

Style Factors	Purpose	Descriptors
Leverage	Captures common variation in stock returns due to differences in the level of company leverage	<ul style="list-style-type: none"> • Book Leverage • Debt-to-Assets • Market Leverage
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"> • Annual Share Turnover • Annual Traded Value Ratio • Monthly Share Turnover • Quarterly Share Turnover
Long-Term Reversal	Explains common variation in returns related to a long-term (five years ex. recent thirteen months) stock price behavior. It is orthogonalized with respect to the Momentum factor.	<ul style="list-style-type: none"> • Long-term Historical Alpha • Long-term Relative Strength
Mid Capitalization	Captures non-linearities in the payoff to the Size factor across the market-cap spectrum. This factor is based on a single raw descriptor: the cube of the Size exposure. However, because this raw descriptor is highly collinear with the Size factor, it is orthogonalized with respect to the Size factor.	<ul style="list-style-type: none"> • Cube of Size Exposure
Momentum	Explains common variation in stock returns based on their performance over the trailing 12 months.	<ul style="list-style-type: none"> • Historical Alpha • Relative Strength 12-month
Profitability	Combination of profitability measures that characterizes efficiency of a firm's operations and total activities	<ul style="list-style-type: none"> • Asset Turnover • Gross Profit Margin • Gross Profitability • Return on Assets
Residual Volatility	<p>Captures relative volatility in stock returns.</p> <p>Consists of three descriptors: (a) the volatility of daily excess returns, (b) the volatility of daily residual returns, and (c) the cumulative range of the stock over the last 12 months. Since these descriptors tend to be highly collinear with the Beta factor, the Residual Volatility factor is orthogonalized with respect to the Beta, Size, and Liquidity factors.</p>	<ul style="list-style-type: none"> • Cumulative Range • Daily Standard Deviation • Historical Sigma

Style Factors	Purpose	Descriptors
Size	Captures the return differences between large-cap stocks and small-cap stocks	<ul style="list-style-type: none"> Log of Market Capitalization

Industry Factors

- | | |
|--|---|
| 1. Aerospace and Defense | 17. Energy |
| 2. Airlines | 18. Food Products |
| 3. Apparel | 19. Food Staples Retail and Household Personal Prod |
| 4. Automobiles and Components | 20. Hardware and Semiconductors |
| 5. Banks | 21. Health Care |
| 6. Beverages and Tobacco | 22. Machinery |
| 7. Building Products | 23. Marine |
| 8. Commercial and Professional Services | 24. Media |
| 9. Commodity Chemicals | 25. Metals and Mining |
| 10. Conglomerates and Distributors | 26. Non-Commodity Chemicals |
| 11. Construction and Engineering | 27. Packaging and Paper and Forest Products |
| 12. Construction Materials | 28. Real Estate |
| 13. Consumer Durables | 29. Retailing |
| 14. Consumer Services | 30. Road and Rail Transportation Infrastructure |
| 15. Diversified Financials and Insurance | 31. Software and Services |
| 16. Electrical Equipment | 32. Utilities |

Market Factor

China Country

Model Coverage

- Total 5489 assets as of May 2, 2018
 - 100% domestic stocks (including all assets in the Shanghai-Hong Kong and Shenzhen-Hong Kong Connect programs)

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