

Delta Factors

Understanding Investment Performance Behaviour

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Delta Factors - Purpose

- ▶ Delta Factors is designed to provide insights into a managed fund's past investment performance behaviour
 - ▶ It is intentionally designed to compliment fund analysis from qualitative research or simple performance analysis
- ▶ It assesses through time
 - ▶ A fund's risk profile
 - ▶ A fund's style therefore whether it is true to label
 - ▶ Indicators of skill via Risk-adjusted value-add metrics
- ▶ It does this using time series analysis of:
 - ▶ Contribution to overall portfolio risk (R-Squared metrics)
 - ▶ Exposures to various factors (Betas)
 - ▶ Value-add from style, security selection, and non-market risks (Alphas)

Delta Factors - Database

- ▶ The latest Delta Factors (31 December 2019)...
 - ▶ Analyses more than 1,700 funds drawn from Financial Express
 - ▶ Including hedge funds, diversified funds, property, regional, infrastructure, traditional and non-traditional equity asset classes
- ▶ This enables apples-and-apples comparisons of various funds to enable better portfolio construction decisions by providing potential answers to the following questions ...
 - ▶ What is the potential market exposure of adding Infrastructure(Hedge funds, et al.) to a Global Equities asset class?
 - ▶ What style factors do non-traditional equity strategies (e.g. long-short, market neutral, et al.) potentially bring to the major equity asset classes?

Delta Factors - Methodology

▶ A combination of:

- ▶ Performance Based Style Analysis - William Sharpe
- ▶ Arbitrage Pricing Theory - Stephen Ross

2 of only 4 Wharton
Jacobs-Levy
Prizewinners for
Quantitative
Financial Innovation

The Arbitrage Pricing Theory (APT) Model:

$$E(r_j) = r_f + \beta_1 RP_1 + \beta_2 RP_2 + \dots + \beta_n RP_n$$

Where:

- $E(r_j)$ – Expected return on portfolio
- r_f – Risk-free rate (e.g. RBA rate)
- β_n – Sensitivity of the asset to risk factor
- RP_n – Risk premium associated with factor n

The beta coefficients in the APT model are estimated using linear regression. In general, historical securities returns (e.g. monthly returns) are regressed on the factor to estimate its beta

6 Factor Definitions - Equities

- ▶ **Markets** - MSCI Australia, MSCI World, MSCI ACWI, or MSCI Emerging Markets
- ▶ **Value minus Growth (VMG)** - This is the value factor and the beta is positive if value style, or negative if growth style.
 - ▶ Value securities have low Price/Book, Fwd PE, or high Dividend Yield;
 - ▶ Growth securities have high EPS Growth, Revenue growth, and/or Internal growth
- ▶ **Small minus Big (SMB)** - This is the Size factor and the beta is positive if the portfolio is biased towards smaller securities and negative for large-cap securities.
 - ▶ Size is based on market capitalisation
- ▶ **Momentum** - Positive Momentum beta occurs if a portfolio is biased towards holding best performing securities over previous 6/12 months
- ▶ **Quality** - Quality securities generally have low levels of debt; positive and consistent profit
- ▶ **Minimum Volatility** - Low beta to index, lower volatility than index, Lower cap bias, and bias towards securities with low idiosyncratic risk

6 Factor Definitions - Equities (Technical)

- ▶ The following factors are calculated for each of the 4 equity markets analysed - i.e. Australia, Emerging Mkts, World, and ACWI
- ▶ **Market**
 - ▶ $R_m - R_f$ = Market Return minus Risk-Free rate (RBA Cash Rate)
- ▶ **Value minus Growth (VMG)**
 - ▶ MSCI Value Index - MSCI Growth Index
- ▶ **Small minus Big (SMB)**
 - ▶ MSCI Small index - MSCI Large Index
- ▶ **Momentum**
 - ▶ MSCI Momentum - Market Index (e.g. MSCI World)
 - ▶ Adjusted for VMG, SMB, and Quality due to long-run medium correlations
 - ▶ After adjustment this factor is uncorrelated/independent to all others from 2004 to latest available data
- ▶ **Quality**
 - ▶ MSCI Quality - Market Index (e.g. MSCI World)
 - ▶ Is adjusted for VMG, SMB, and Momentum due to long-run medium correlations
 - ▶ After adjustment this factor is uncorrelated/independent to all others from 2004 to latest available data
- ▶ **Min_Vol**
 - ▶ MSCI Min_Vol - Market Index (e.g. MSCI World)
 - ▶ Is adjusted for VMG, SMB, Momentum, and Quality due to some correlations and ensure independence
 - ▶ After adjustment this factor is uncorrelated/independent to all others from 2004 to latest available data

Global Bond Factor Definitions

- ▶ There are 2 Delta Factors models available when undertaking Global market analysis:
 - ▶ Multi model is a 2 factor model consisting of ...
 - ▶ **Market** - Bloomberg Barclays Global Aggregate (Hdg AUD) ... this is an investment grade global bond index that is generally used for benchmark the global bond asset class
 - ▶ **Hi-Yield** - Bloomberg Barclays Global High Yield (Hdg AUD) ... this is a non-investment grade global bond index. The factor used in Delta Factors is a market neutral application that represents the return premium of Bloomberg Barclays Global High Yield over the **Market** benchmark
 - ▶ The single factor model (CAPM) uses a ...
 - ▶ **Government Bond Index** ... represented by the Vanguard International Fixed Interest (Hdg AUD) index ... this is widely used as a passive alternative to actively managed global bond funds and tracks the Bloomberg Barclays Global Treasury Scaled Index (Hedged to AUD) and previously tracked the Citi World Government Bond index (Hedged to AUD)

Australian Bond Factor Definitions

- ▶ There are 2 Delta Factors models available when undertaking Australian market bond analysis:
 - ▶ Multi model is a 3-factor model consisting of ...
 - ▶ **Duration** - Bloomberg Ausbond Treasury premium over the Bloomberg Ausbond Bank (Cash) index
 - ▶ **Credit** - Bloomberg Ausbond Credit index premium to the Bloomberg Ausbond Bank index and adjusts for duration ... meaning it is representative of the movements in credit spreads and independent of duration risk
 - ▶ **Inflation** - Bloomberg Ausbond Inflation premium to the Bloomberg Ausbond Bank index and adjusts for duration and credit risk ... meaning it is representative of the movements in the inflation component of bond securities and independent of duration and credit risks
 - ▶ The single factor model (CAPM) uses the
 - ▶ **Composite** index ... which is the Bloomberg Ausbond Composite index premium over the Bloomberg Ausbond Bank (Cash) index. The Composite index is widely regarded as the primary benchmark for Australian bond portfolios

Equity Factor Performance

- ▶ The following 4 charts show the rolling 36-month performance of all 5 factors for the 4 markets (Australia, World, ACWI, and Emerging Markets)
- ▶ It shows that different factors will outperform for long periods of time at different points in time, and may differ between markets

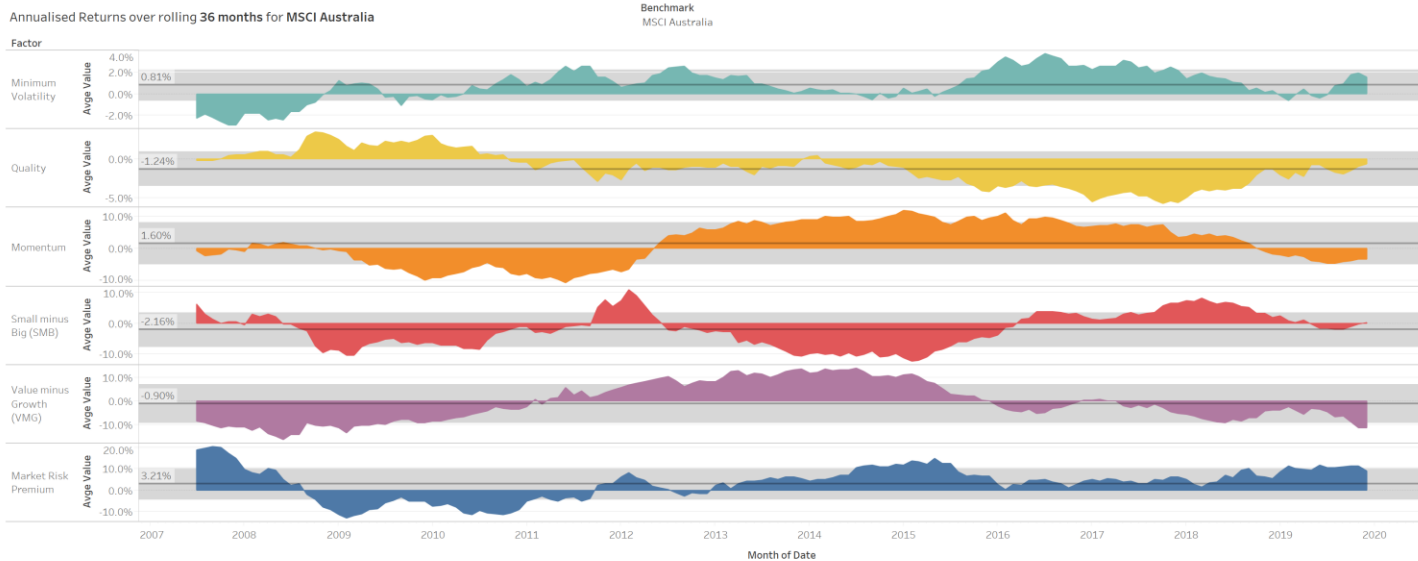
Factor Performance - MSCI Australia



Delta Factors
 Understanding Investment Performance Behaviour
 Equity Factor Performance
 Source: MSCI, Delta Research & Advisory

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Annualised Returns over rolling 36 months for MSCI Australia



Date
 31-Jul-07 to 31-Dec-19



Factor Performance - MSCI World

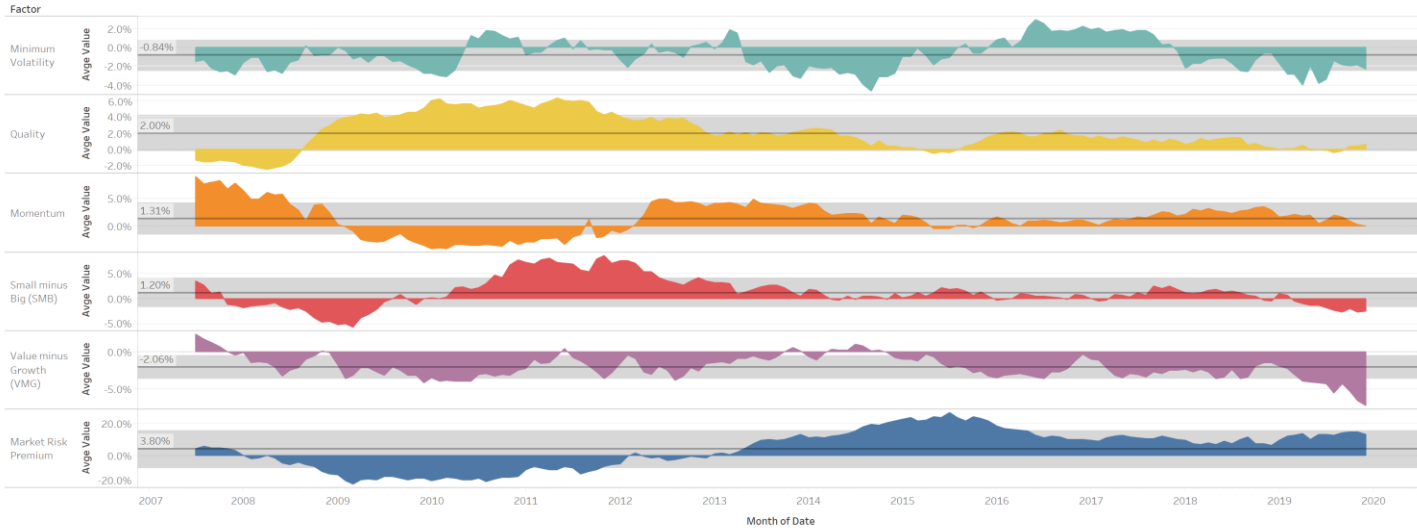


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 Equity Factor Performance
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Annualised Returns over rolling 36 months for MSCI World

Benchmark
 MSCI World



Date
 31-Jul-07 to 31-Dec-19



Factor Performance – MSCI ACWI

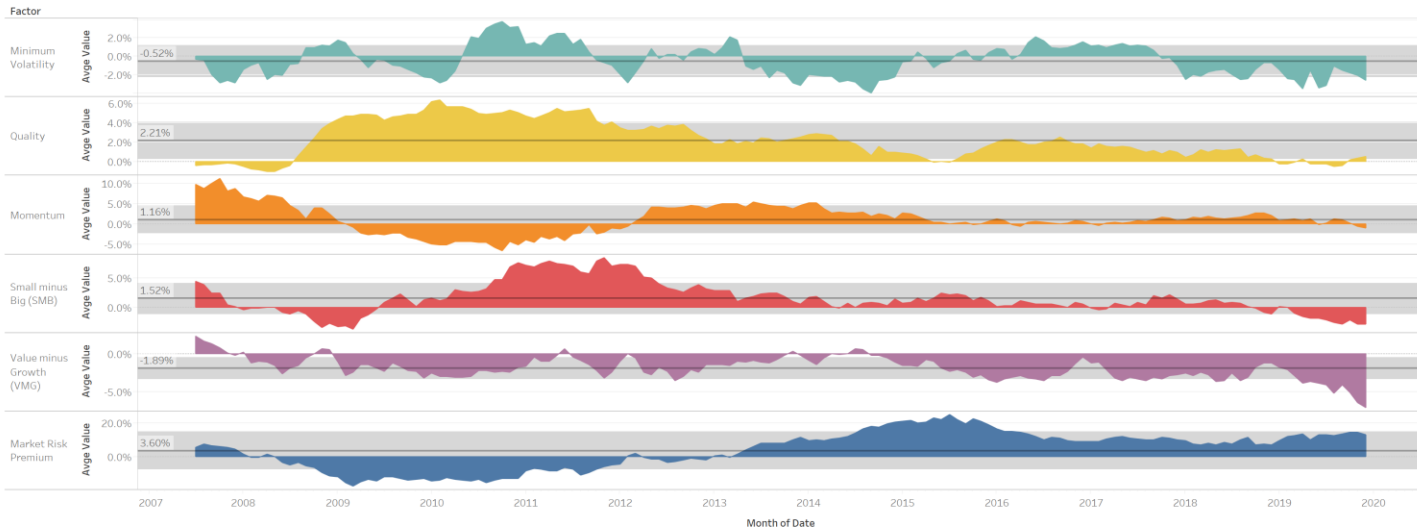


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Equity Factor Performance
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Annualised Returns over rolling 36 months for MSCI ACWI

Benchmark
MSCI ACWI



Date
31-Jul-07 to 31-Dec-19



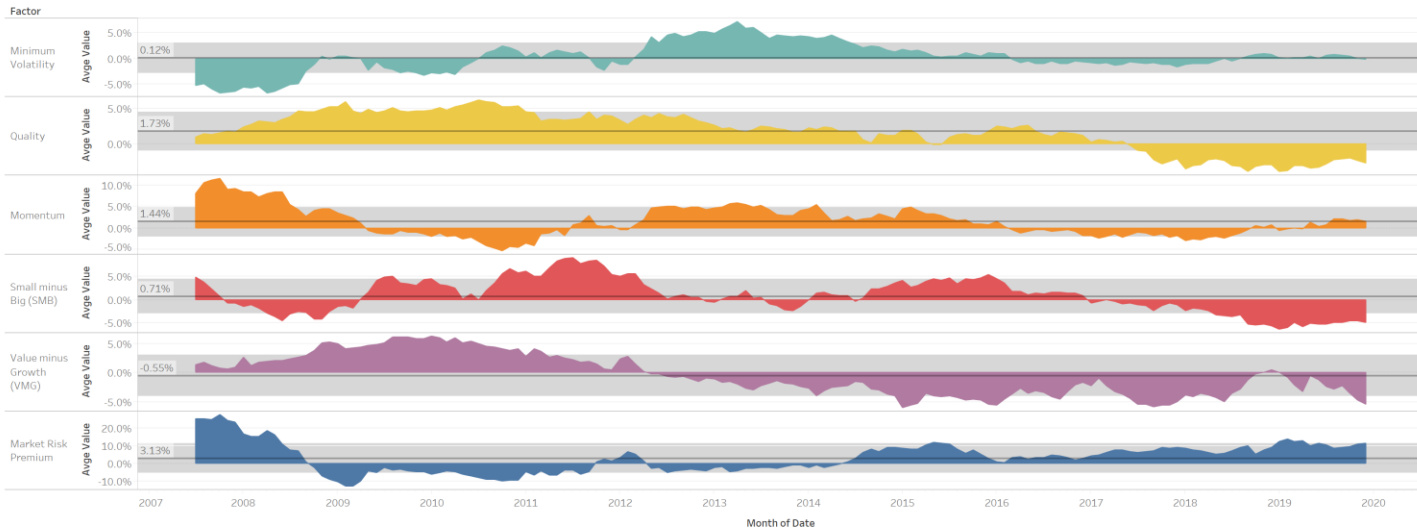
Factor Performance - MSCI Emerging Mkts



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 Equity Factor Performance
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Annualised Returns over rolling 36 months for MSCI EM



Date
 31-Jul-07 to 31-Dec-19



Delta Factors - 5 Factor Example



Delta Factors
Understanding Investment Performance Behaviour
Global Equities
Rolling 36 months

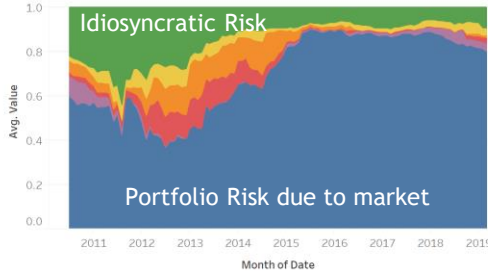
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Benchmark: MSCI World
Asset Class: All
Sector: All
APIR Code: All

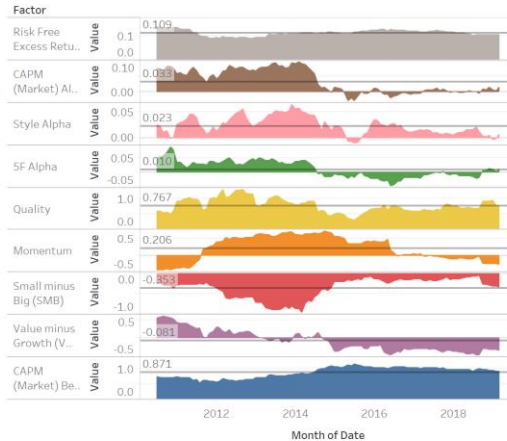
Exposures (Betas), Value-Add (Alphas) and Volatility for

Fund

Portfolio Risk Contribution for
Management Fee - & ICR - , APIR -



Date
31-Jul-07 12:00:00 AM to 31-Mar-19 12:00:00 AM



- ▶ Rolling 36 months . Avoids short-termism
- ▶ LH Chart - Break-up of portfolio risk (Variance)
- ▶ RH Charts - Volatility (Grey), Alphas and Betas



Delta Factors - Analysis Interpretation

▶ Portfolio Risk - Left Hand Chart

- ▶ The proportion of market risk (Blue) has become a consistent 90% since the 3 years to 2015. Previously this strategy had very low levels of market risk and was therefore much different to the market (i.e. MSCI World)
- ▶ On the flipside, taking fewer non-systematic risks as Idiosyncratic risk (Green) has diminished significantly

▶ Exposures (Betas) - Right Hand Charts

- ▶ Market Beta (Blue) has increased from low (0.6-0.8) to Beta =1 (or market equal risk)
- ▶ Shifted from Value to Growth style over recent years (Purple from positive to negative)
- ▶ Mostly Large Cap (Red is mostly negative)
- ▶ Mostly positive momentum (Orange) but has become contrarian (negative Orange) in recent years
- ▶ Consistent and very strong Quality (Yellow) style

▶ Value-Add (Alphas) - Right Hand Charts

- ▶ Lower levels of idiosyncratic risk has potentially led to declining security selection/market timing alpha (Green 5F Alpha).
- ▶ Style Alpha (Pink) has consistently been positive and is largely due to strong Quality bias which has produced strong positive alpha since the GFC
- ▶ Market adjusted Alpha (Brown - CAPM Alpha) has struggled in recent years

Comparison of Funds across all metrics is also available ...



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Benchmark - MSCI Australia
Rolling 36 months

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Metric - CAPM (Market) Alpha

Factor
CAPM (Market) Alpha



► ... and we can easily reduce the number of funds to make it useful!



For any questions please contact ...

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DELTA
Research and Advisory