# Standard Value

The Industrialization of Alpha

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# About Us

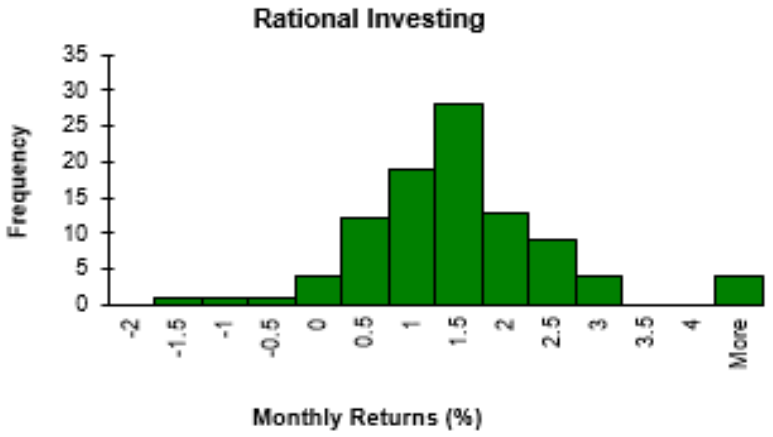
- Rational Investing LLC was founded on the premise that finance is like any other industry – its science can be standardized, automated, and scaled
- The principals came together in the early 2000's in the belief that over time, such an approach had to win vs. idiosyncratic management of risk
- Our team of 20 professionals builds DCF models for 3,000 stocks worldwide, an incredibly productive equity research process
- The entire team is trained in engineering or finance, a majority in both between college and business school
- Our toolkit is built around core ideas learned at the University of Chicago, integrated in unorthodox ways
- The work is focused on recurring marginal costs and differentiating between accounting treatment and risk measurement

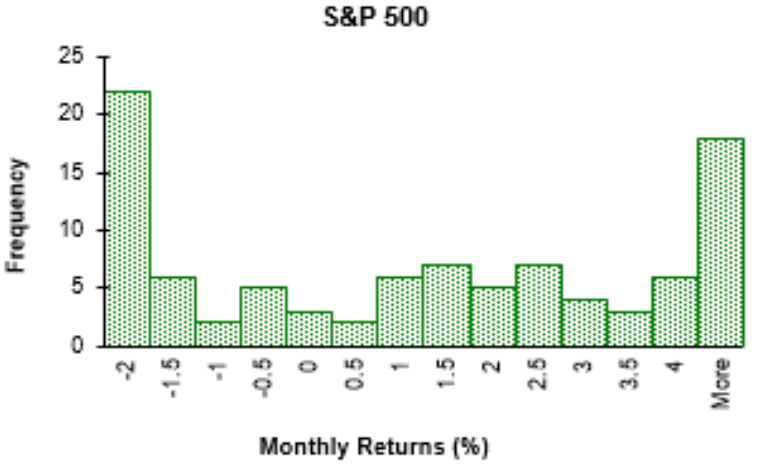
# Forward Looking Clarity, Capability, Speed

- **Standardized Risk Adjusted DCF Model**
- Unbiased update and review of 1,500 earnings statements a month
- Artificial Intelligence: logical **decision trees** to integrate fundamental information
- Estimate cash flow defensible through the business cycle, and the costs of product and capital for marginal revenue
- Our CAPM constructs the discount rate, but that is 10% of model logic
- Adjusts for the Fed / QE cycle, materially adding to excess return
- We run a ‘clean room’: **No guidance, consensus estimates**, or tea leaves
- 15 analysts review models for corrections and footnote + event processing – **systems scale a labor intensive corporate finance process**
- Principals review mispriced firms and large client positions
- Stringent quality monitoring – Industrial process, not idiosyncratic result
- Finished product works globally – standalone Sharpe 2+ historical record

# 8 Year US Simulation

| Year Ending | Unlevered Return | Long / Short Positions | S&P500 Return |
|---|---|---|---|
| Aug-08 | 14.3% | 865 / 333 | -13.0% |
| Aug-09 | 29.1% | 705 / 480 | -20.4% |
| Aug-10 | 12.7% | 1158 / 190 | 2.8% |
| Aug-11 | 17.5% | 775 / 379 | 16.2% |
| Aug-12 | 17.1% | 888 / 299 | 15.4% |
| Aug-13 | 13.0% | 526 / 458 | 16.1% |
| Aug-14 | 13.2% | 377 / 492 | 22.7% |
| Aug-15 | 17.1% | 485 / 387 | -1.6% |
| **Cumulative** | **242.8%** | | **33.8%** |




| | |
|---|---|
| Average Annual Return | 16.7% |
| SD Annualized | 4.9% |
| Sharpe Ratio | 3.4 |

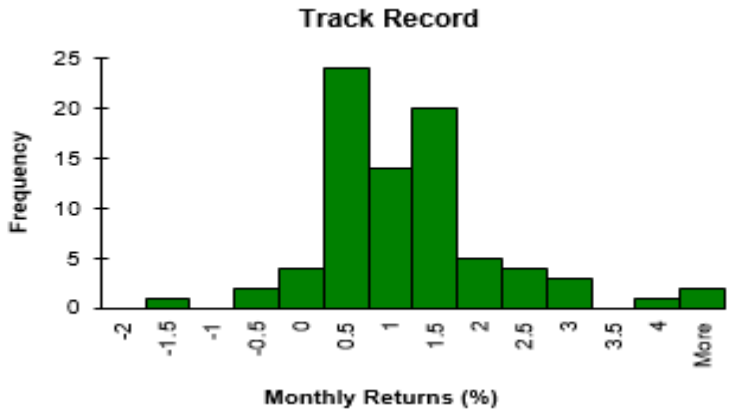
Excluding financials and utilities. Exposure is aggregate of individual buy/sell decisions by Rational Investing model, 5% per sector net limit, 5% stop loss, monthly rebalancing, 25% mis-pricing threshold for investment, 10% for exit .

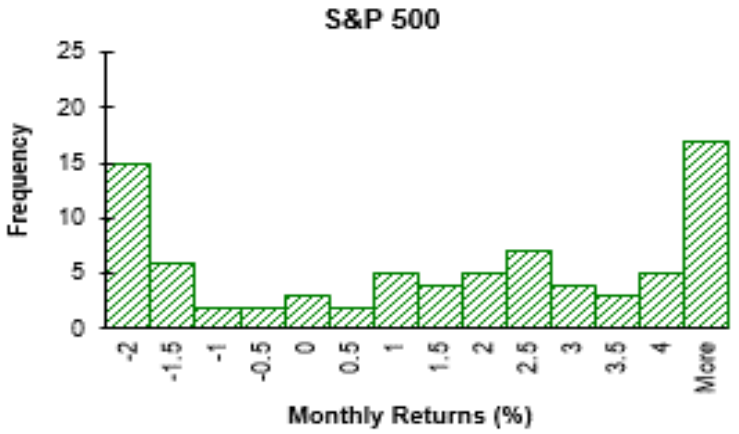
# US Feed Track Record

| 6 Months Ending | Unlevered Return | Long / Short Positions | S&P500 Return |
|---|---|---|---|
| Feb-09* | 2.7% | 912 / 78 | -18.6% |
| Aug-09 | 15.9% | 585 / 294 | 38.8% |
| Feb-10 | 6.0% | 537 / 298 | 8.2% |
| Aug-10 | 7.2% | 771 / 151 | -5.0% |
| Feb-11 | 12.7% | 472 / 342 | 26.5% |
| Aug-11 | 3.0% | 540 / 300 | -8.2% |
| Feb-12 | 5.2% | 343 / 420 | 12.0% |
| Aug-12 | 3.7% | 408 / 331 | 3.0% |
| Feb-13 | 4.3% | 409 / 327 | 7.7% |
| Aug-13 | 5.2% | 302 / 452 | 7.8% |
| Feb-14 | 4.3% | 173 / 665 | 13.9% |
| Aug-14 | 4.8% | 361 / 359 | 7.7% |
| Feb-15 | 4.8% | 435 / 255 | 5.0% |
| Aug-15 | 5.7% | 329 / 378 | -6.3% |
| **Cumulative** | **127.7%** | | **118.3%** |

** 2 months only*

| | |
|---|---|
| Average Annual Return | 13.1% |
| SD Annualized | 4.9% |
| Sharpe Ratio | 2.7 |



# Intuitive Methodology Implements Scalable Fundamental Process

**Short Term Anomaly or Multi-Decade Fundamentals**

- Statistical approaches face limits of size and circumstance
- Statistical Arbitrage – price autocorrelation or mean reversion
- Multi-Factor Models – cross sectional regression on a few factors
- Incomprehensible to the fundamental investor's naked eye

**Standard Value: Marginal Revenue vs. Marginal Cost, Intuitive Interface**

- Consistent, scalable approach to corporate finance + CAPM
- Standard Excel spreadsheet result
- Valuation adapts to macro cycle through yield curve
- Observation backed by intuition i.e. we are always able to answer 'Why?'
- Finished Product Tested under Market Neutral Constraints
- No limits to long portfolio capitalization, substantial short capacity

# Corporate Finance Technology Harnesses Data to Standardize Valuation




- Our system integrates hundreds of non-linear contingent relationships
- It parses a massive, distributed decision tree to produce a DCF model with
  - **Dampened data volatility, scrubbing of non-recurring items**
  - **Projection of financial statements through the business cycle**
  - **Automated normalization of events and costs**
  - A unique, **forward looking Discount Rate** reflecting marginal cost of capital to the company at that point in the business cycle
  - The impact of **Leverage, Taxes and Monetary Policy**
- **Corporate Event checks, reconciliation with balance sheet explain shifts in trends**

# Artificial Intelligence Drives Global Template

- **We incorporate global yield curve and FX history, and have scrubbed corporate data history for circa 5,000 firms**
- A single valuation template acts consistently across sectors, geography and time
- Every macro environment implies its own valuation conditions
- We adjust GAAP / IFRS numbers to generate recurring cash flow, e.g.
  - Revenue is normalized from periodic, cyclical and seasonal trends
  - Conventions / terminology / obfuscation vary considerably across countries
  - Translate the current point in the business cycle to terminal cost structure
- **Our analyst team enhances the systematic results sans opinions**
  - Adjust for a variety of one-off items – litigation settlements, merger costs etc.
  - Incorporate and project balance sheet changes and financial engineering from disclosures in footnotes e.g. hedges, mineral reserves, equity dilution
  - Build a history of M&A and divestitures to understand management behavior
  - Incorporate additional information e.g. statement of comprehensive income

# Focus Lowers Cost of Information

- Risk switches + 2 years of fundamental data is sufficient and adaptive to changing macro and competitive conditions
- Sophisticated, mature interpolation, data scrubbing and boundary estimation
- Contingent probability economic relationships are used to project financial statements and eliminate noise
- Projections are based on cyclicality and CapEx requirements rather than sector
  - The reasonableness and consistency of the fit across geography and sectors allows for high confidence without tremendous history
- Scalable and enterprise quality infrastructure refined over a decade
  - We have modeled a variety of global indexes at www.rationalinvesting.com
  - We have market neutral tested history for US, Japan, Canada, UK
  - MSCI W coverage for the past three years

# Industrialized Alpha




- The modeling process often points out issues in data; correcting data offers insight into improving the model, creating a positive feedback loop.
- As a result, this system and its data has become like a matured vineyard, a result achievable only through comparable effort and time
- We have experience in gathering company data history from multiple sources and cross-checking it for consistency where necessary
- Market neutral returns have a Sharpe Ratio of 1 to 4 depending on constraints
- This result represents a disruptive level of capability, at a scale not reproducible by individual analysts

# Biography

**Manish Aurora,** Managing Principal - Methodology and Product Architecture

- Co-founded Rational Investing LLC and built its first valuations starting in 1998. The firm is now 20 professionals modeling the G7 and MSCI World markets
- Designed and developed the FX trading platform of FXCM www.fxcm.com, the world's largest non-bank online FX dealer
- Converted Merrill's European FX derivatives exposure at NYC, London, Singapore offices to the Euro
- Reprogrammed JP Morgan's global swaps pricing and counterparty credit risk calculation using Massively Parallel Supercomputing technology
- Designed the Value at Risk calculator for the merger of Chase and Chemical, then the biggest bank merger ever, under a tight deadline from the Federal Reserve
- Designed and constructed the first CMBS and Corporate Bond credit risk models at BlackRock
- Sell-side analyst at Nomura Securities covering real estate equity, debt, CMBS
- Built the first commercial paper direct issuance and investment management and reporting system for GE Capital, ITT, Ford at Financial Sciences
- MBA from University of Chicago; BS in computer science, University of Scranton

# Biography

**Harbhajan Aurora** Founding Principal, Technology and Research Management, Bombay

- Recruits and trains the analyst and software engineering teams in corporate finance
- Co-founded Rational Investing LLC and, since 1999, oversees the analyst team. Instrumental in creating the valuation and data normalization processes
- Coordinated development of the FXCM trading platform and oversaw its test team
- Principal of a textile manufacturing and trading business for 20 years in Bombay and Surat
- Head of Chicago Pneumatic's North Indian marketing and sales, managed 30 professionals selling machinery for large-scale infrastructure projects of national importance
- BSE from the University of Punjab. State record for mathematics proficiency

**Pieter Hellquist** Principal, Fundamental and Valuation Research 2009 - present

- Reviews results of 2,500 Standard DCF valuations produced quarterly by the firm
- Oversee supporting fundamental research by offshore team
- Head of International Operations for Velocity, a provider of electronic trading systems
- Global Product Manager for Citibank's cross border equities data and trading systems
- Senior Manager for the Citi's e-commerce in Europe and its FX trading systems out of Australia
- Marketing Manager in London for Information Products for Reuters - Northern Europe; Marketing Director Japan built a US$ 100+ million practically from scratch
- MBA from INSEAD, M.Engg at Lund University, Sweden; year at Ecole Centrale de Paris

# Appendix: Modern Portfolio Theory => Forward Looking Risk Estimation

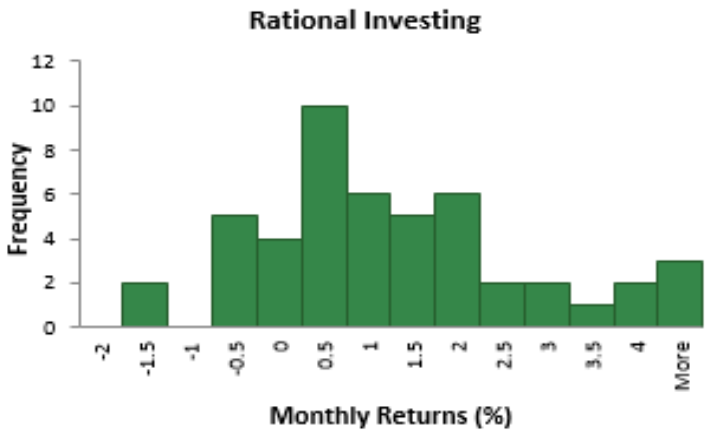
- Risk Aversion leads to Diversification - (Maximize) Mean (Minimize) Variance
- Beta – Correlation to Market Portfolio is the driver of risk.
- Beta is elusive in calculation and implementation
- Evidence of ‘un-diversifiable’ fundamental factors in returns such as size, distress, R&D / intellectual property / brand strength / regulation
- We have calculated or examined these characteristics of firms for a decade
- Standard Value: An integrated valuation incorporating
  - **Fundamental historical inputs** which reveal Industry / Firm cyclicality, margins and capital structure
  - **The risk aversion of Public rather than Private Investors -** extrapolates company fundamentals without the assumptions of certainty or control
  - **The impact of the Yield Curve and credit conditions as inputs into a CAPM**

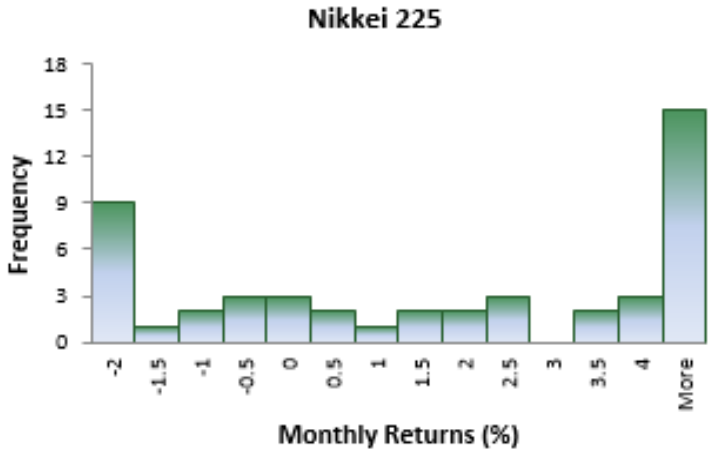
# Appendix

## Japan Simulation September 2011- August 2015

| Qtr. Ending | Unlevered Return | Long / Short Positions | Nikkei 225 |
|---|---|---|---|
| Nov-11 | -2.1% | 215 / 28 | -5.8% |
| Feb-12 | 2.5% | 182 / 57 | 8.6% |
| May-12 | 5.3% | 206 / 41 | -4.6% |
| Aug-12 | 2.6% | 200 / 47 | 3.5% |
| Nov-12 | -0.3% | 186 /48 | 6.9% |
| Feb-13 | 9.5% | 170 / 58 | 22.4% |
| May-13 | 2.0% | 150 / 77 | 19.0% |
| Aug-13 | -2.7% | 172 / 63 | -2.8% |
| Nov-13 | 6.7% | 175 / 62 | 17.0% |
| Feb-14 | 2.4% | 181 / 50 | -5.2% |
| May-14 | 4.5% | 214 / 34 | -1.4% |
| Aug-14 | 6.6% | 176 /56 | 5.4% |
| Nov-14 | 3.1% | 187 / 58 | 13.2% |
| Feb-15 | 2.9% | 182 / 50 | 7.7% |
| May-15 | 5.0% | 125 / 66 | 9.4% |
| Aug-15 | 1.9% | 152 / 51 | -8.1% |
| **Cumulative** | **61.7%** | | **110.9%** |

| | |
|---|---|
| Average Annual Return | 12.8% |
| SD Annualized | 5.4% |
| Sharpe Ratio | 2.4 |



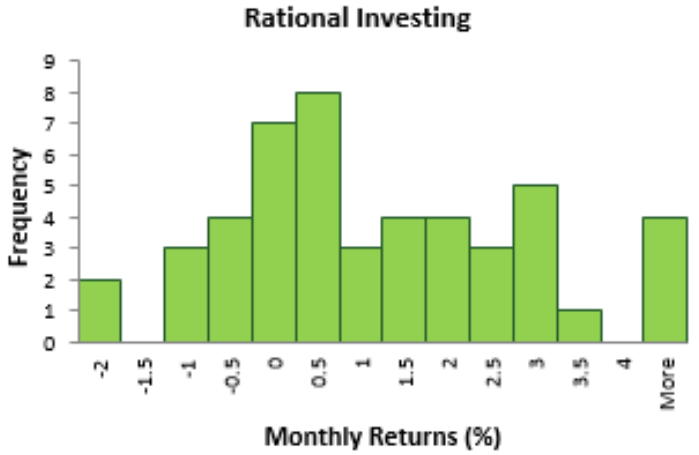



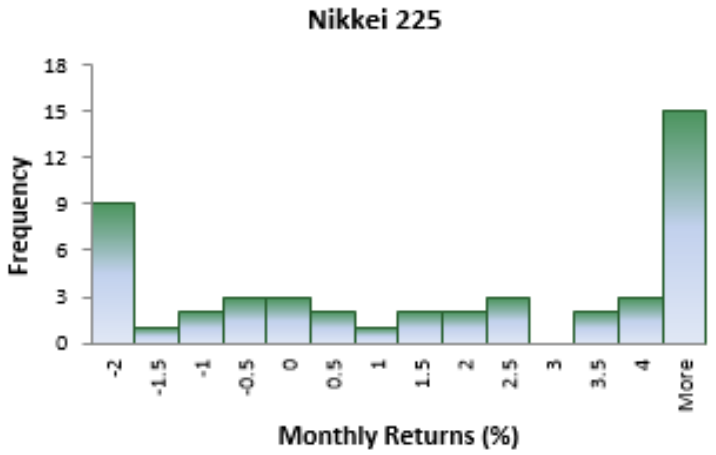
# Appendix

## Japan Feed Simulation September 2011- August 2015

| Qtr. Ending | Unlevered Return | Long / Short Positions | Nikkei 225 |
|---|---|---|---|
| Nov-11 | -2.7% | 84 / 17 | -5.8% |
| Feb-12 | 2.3% | 66 / 27 | 8.6% |
| May-12 | 4.3% | 74 / 15 | -4.6% |
| Aug-12 | 0.6% | 90 / 13 | 3.5% |
| Nov-12 | -1.5% | 63 / 43 | 6.9% |
| Feb-13 | 9.0% | 61 / 51 | 22.4% |
| May-13 | 3.8% | 71 / 51 | 19.0% |
| Aug-13 | 1.1% | 86 / 43 | -2.8% |
| Nov-13 | 7.1% | 140 / 35 | 17.0% |
| Feb-14 | 4.4% | 156 / 32 | -5.2% |
| May-14 | 1.3% | 166 / 23 | -1.4% |
| Aug-14 | 6.0% | 142 / 49 | 5.4% |
| Nov-14 | 2.0% | 119 / 68 | 13.2% |
| Feb-15 | 3.0% | 155 / 44 | 7.7% |
| May-15 | 5.5% | 102 / 86 | 9.4% |
| Aug-15 | 1.1% | 130 / 36 | -8.1% |
| **Cumulative** | **55.6%** | | **110.9%** |

| | |
|---|---|
| Average Annual Return | 11.7% |
| SD Annualized | 6.1% |
| Sharpe Ratio | 1.9 |



# Appendix

## UK Simulation September 2011- August 2015

| Qtr. Ending | Unlevered Return | Long / Short Positions | FTSE 100 Return |
|---|---|---|---|
| Nov-11 | 4.1% | 100 / 6 | 2.1% |
| Feb-12 | 3.2% | 107 / 9 | 6.6% |
| May-12 | 0.8% | 107 / 13 | -9.6% |
| Aug-12 | 5.1% | 94 / 18 | 7.6% |
| Nov-12 | 3.8% | 85 / 20 | 2.7% |
| Feb-13 | 5.6% | 65 / 34 | 8.4% |
| May-13 | 5.4% | 63 / 30 | 3.5% |
| Aug-13 | 3.2% | 50 / 33 | -2.6% |
| Nov-13 | 3.2% | 51 / 28 | 3.7% |
| Feb-14 | 3.8% | 48 /31 | 2.4% |
| May-14 | 2.3% | 49 / 30 | 0.5% |
| Aug-14 | 0.1% | 53 / 39 | -0.4% |
| Nov-14 | -1.7% | 54 / 44 | -1.4% |
| Feb-15 | 3.5% | 49 /34 | 3.3% |
| May-15 | 5.3% | 79 / 16 | 0.5% |
| Aug-15 | 1.3% | 61 / 22 | -10.5% |
| **Cumulative** | **61.2%** | | **15.8%** |

| | |
|---|---|
| Average Annual Return | 12.7% |
| SD Annualized | 4.6% |
| Sharpe Ratio | 2.6 |