

Impact of volatile markets on fair valuation of international funds

The session will cover the following topics:

- Current model performance
- Latest trends in systematic fair valuation
- Is it time for fair value adjusted benchmark indices?

Presented by

Rob Haddad, Director – Evaluated Services

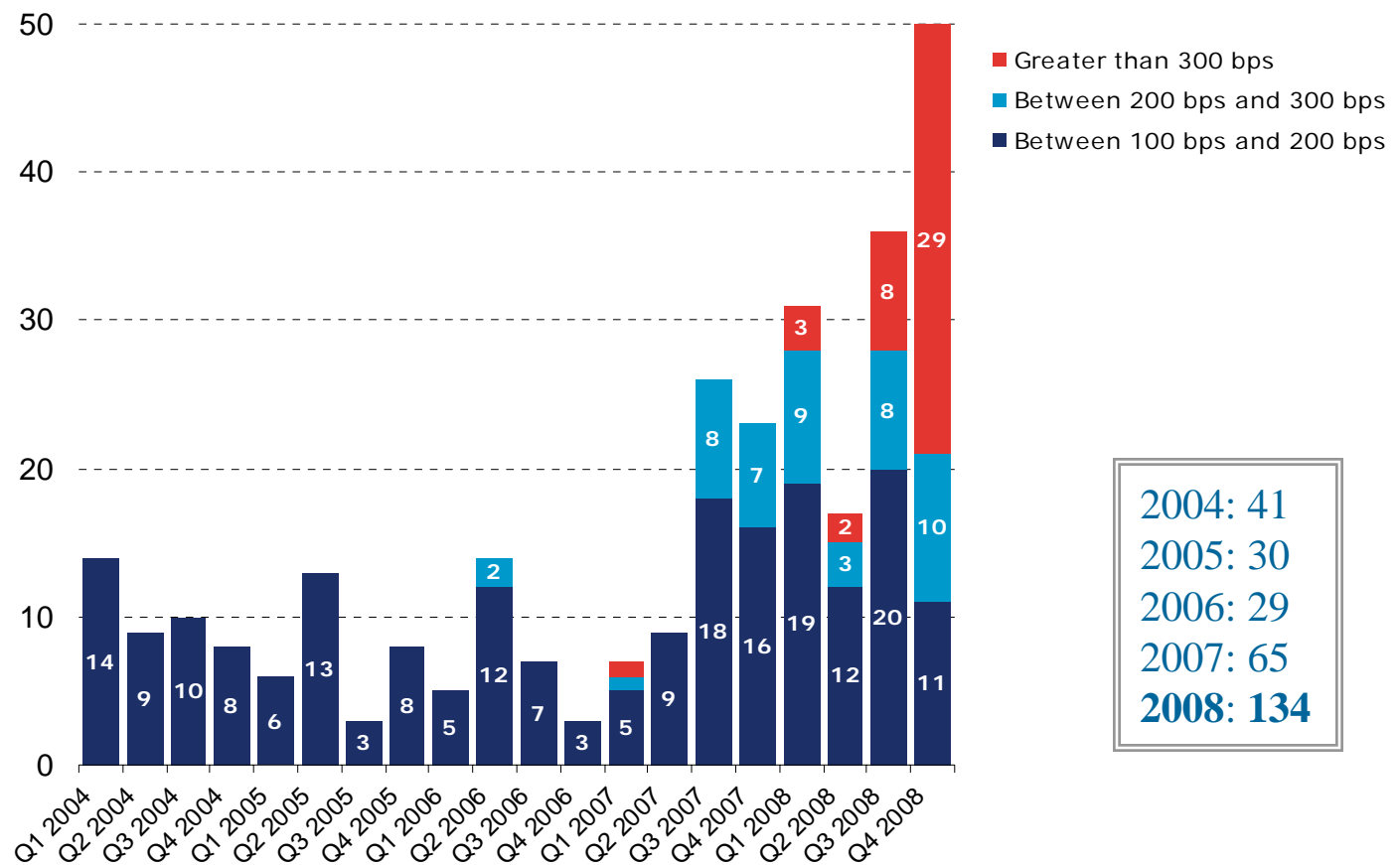
Liz Duggan, Chief Operating Officer – Evaluated Services

Interactive Data



Current Volatility in the Market

No. of Days When the Change in the S&P 500® Index Exceeded 100 bps
 Quarterly Results from January 2004 to December 2008



What does Interactive Data provide?

Fair Value Information Service

- Provides subscribers with an **input** which can be used in their independent fair value determinations
- Is an **evaluation** which is an estimate of the price that would prevail in a liquid market for an international, exchange-traded equity given information available at the time of evaluation, i.e. close of the New York Stock Exchange, close of London Stock Exchange, or London noon.

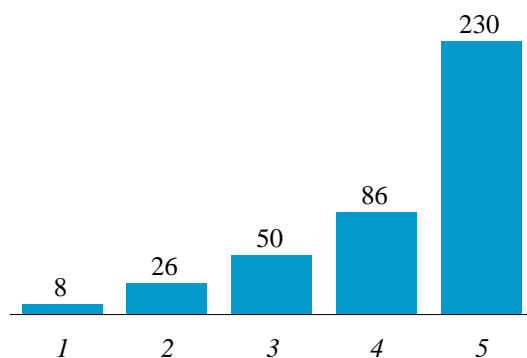
Fair Value Information Service

- Does **not** take into account events that occur after the time of evaluation
 - Important to consider when back-testing against next day local open prices
- *Example: 4:15 p.m. Eastern Time (ET) - Intel Earnings Announcement*

Volatility in U.S. Markets – Global Driver of Future Equity Prices

Volatility

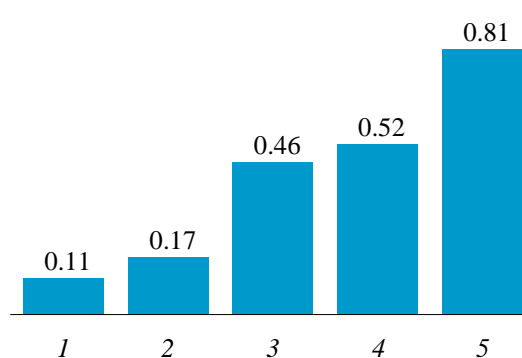
Movements in U.S. Markets



Average of the S&P 500® Index Absolute Movements from January 2004 to December 2008 in bps, per quintile*

Predictability

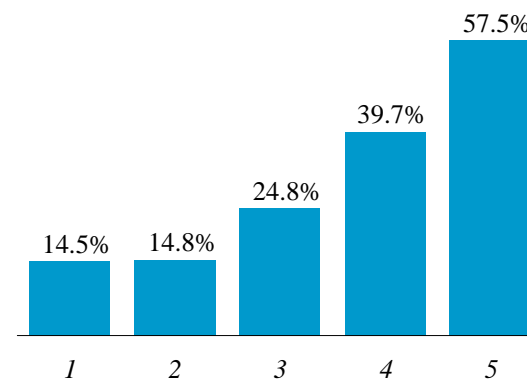
Correlation of equity movements



Correlation Between S&P 500® Index movements from 4 p.m. ET close (t-1) to 4 p.m. ET and an International portfolio's movements from local close to next day open, per quintile**

Model Performance

Absolute Distance Reduction



FVIS adjustments reduce distance between local close and next day open prices of the International portfolio, increasingly per quintile

*Each quintile represents a category of 250 days from the five-year period spanning January 2004 to December 2008, determined by the magnitude of absolute percentage movement in the S&P 500® Index from New York close to New York close (e.g., 1 = days with smallest movements, ..., 5 = days with largest movements).

**The Hypothetical International Portfolio is created from the market capitalization weighted movements of 750 international equities ("750-Portfolio"), from January 2004 to December 2008.

Model Performance in Extreme Volatility

Headline Examples from 2008...

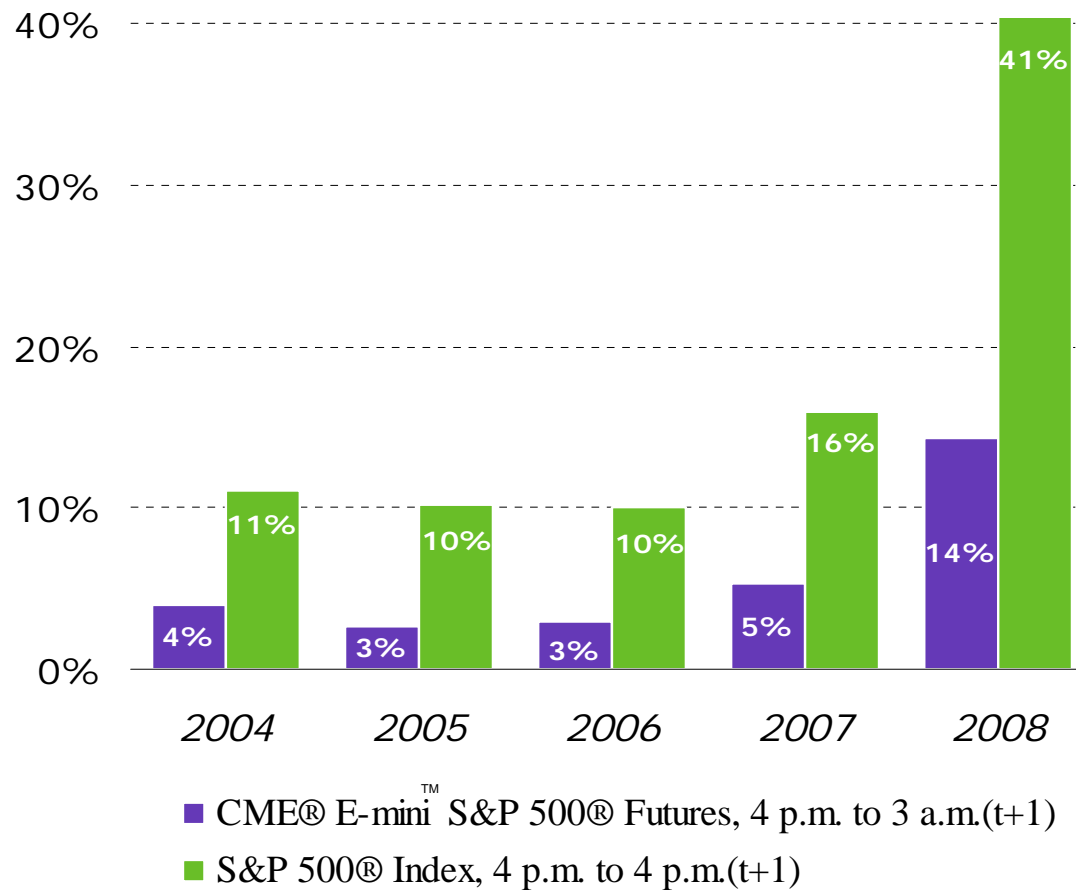


How did the Fair Value Information Service perform on the 750-Portfolio?

- **September 29, 2008** – the S&P 500® Index declined 8.8% following the U.S. House of Representatives' initial rejection of the Emergency Economic Stabilization Act
 - FVIS adjustments reduced the distance from the local close to the next day's open by over **89%**
- **October 13, 2008** – (Columbus Day) the Dow Jones Industrial Average® gained 936.42 points, or 11.1%, its largest point gain in history
 - FVIS adjustments reduced the distance from the local close to the next day's open by over **87%**

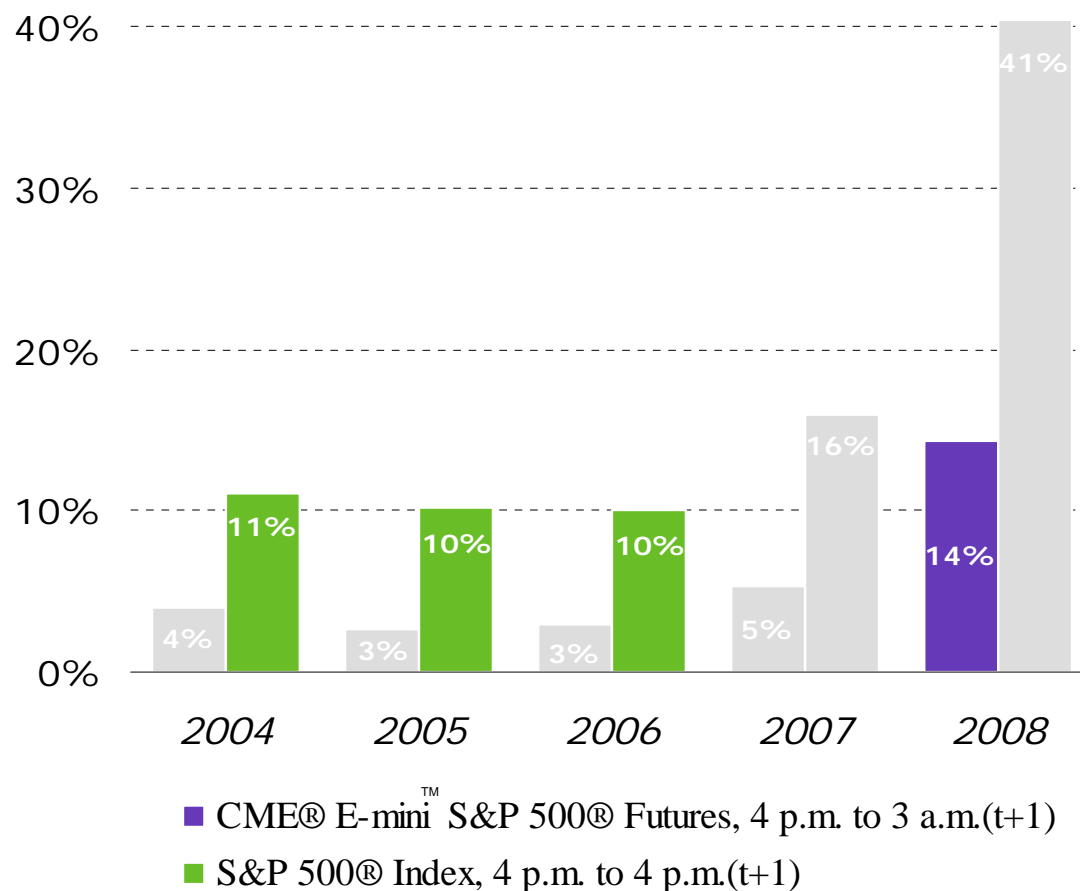
Volatility in 2008

Annualized Standard Deviation of Daily Movements



Volatility in 2008 – Continuing After 4 p.m. ET

Annualized Standard Deviation of Daily Movements



Controlling for Activity After 4 p.m. ET in Back-testing

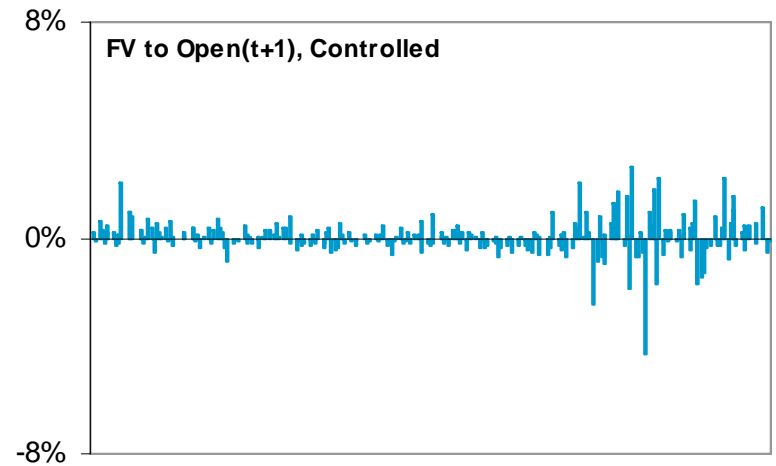
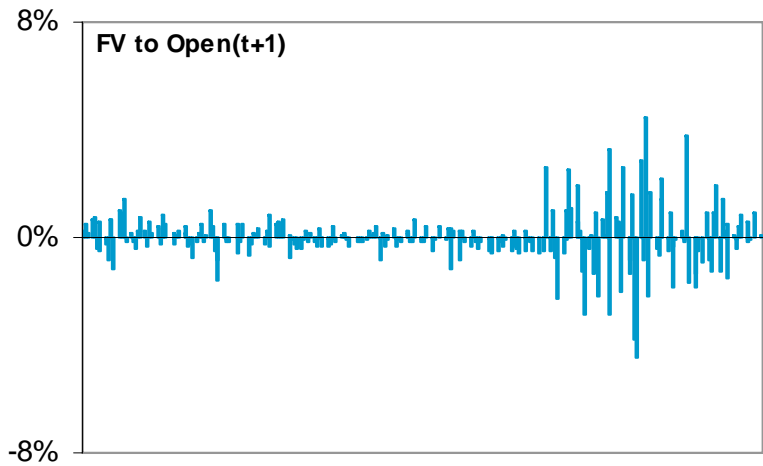
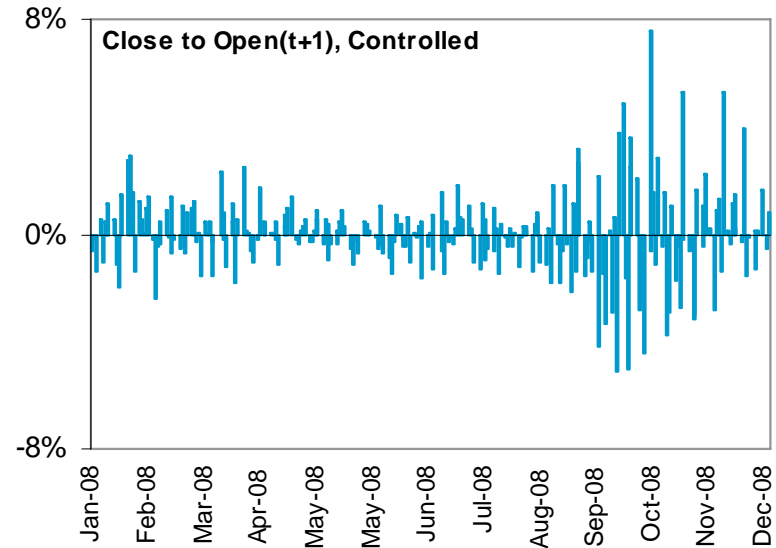
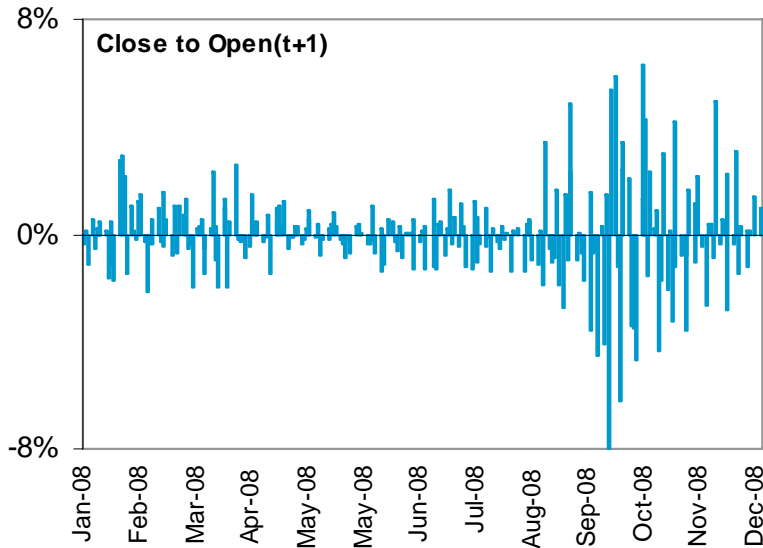
Accounting for post 4 p.m. market movements

- Market activity occurring between 4 p.m. and the next day open can impact fair valuation performance measurements
 - e.g., S&P 500® Futures movements, FX rate fluctuations

- One method of accounting for this activity is to **control** for it
 - 1) Determine the beta between the S&P 500® Futures movements from 4 p.m. to 3 a.m.(t+1) and the close to open movements

 - 2) Subtract the beta-weighted post 4 p.m. S&P 500® Futures movements from the close to open and FV adj. to open series

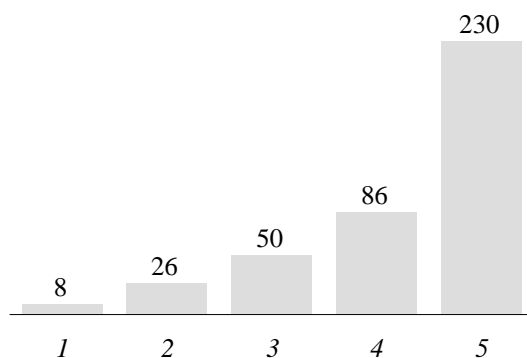
750-Portfolio Movements in 2008



Volatility in U.S. Markets – Global Driver of Future Equity Prices

Volatility

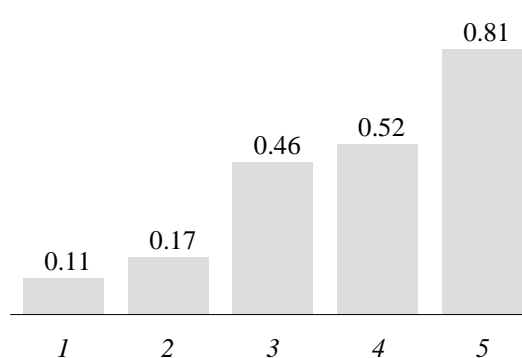
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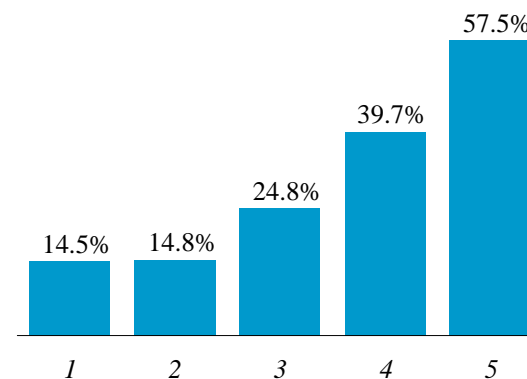
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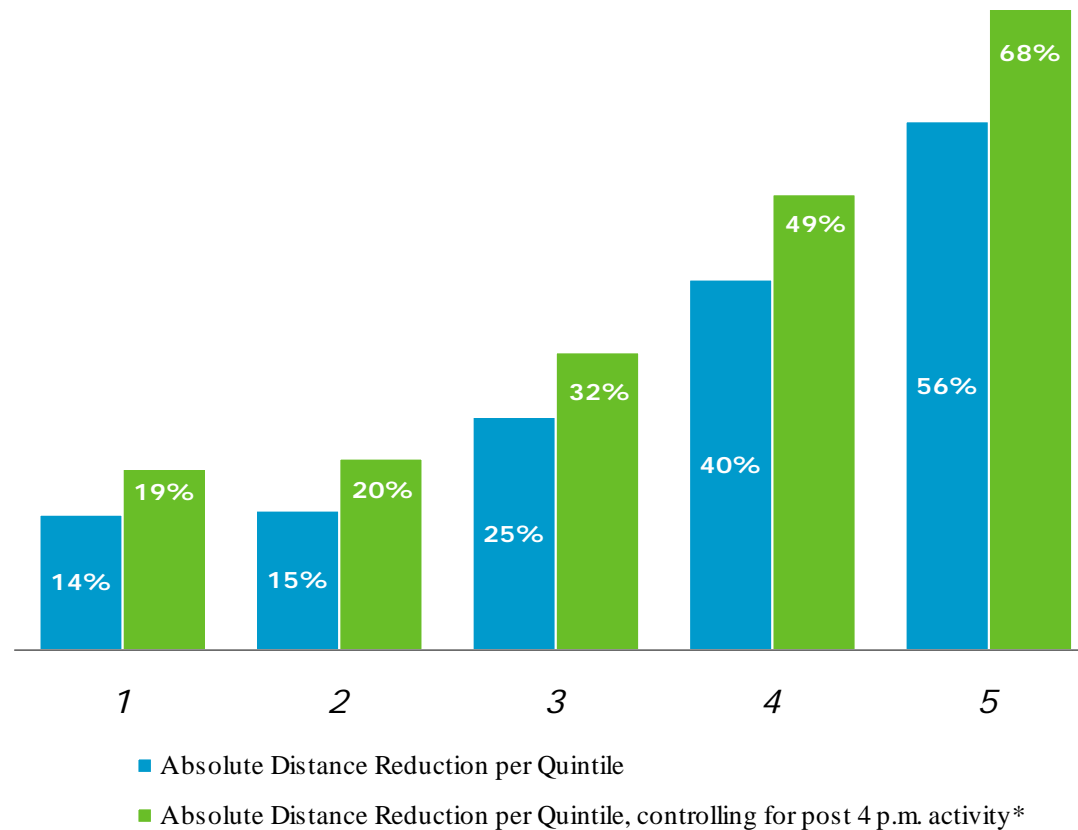
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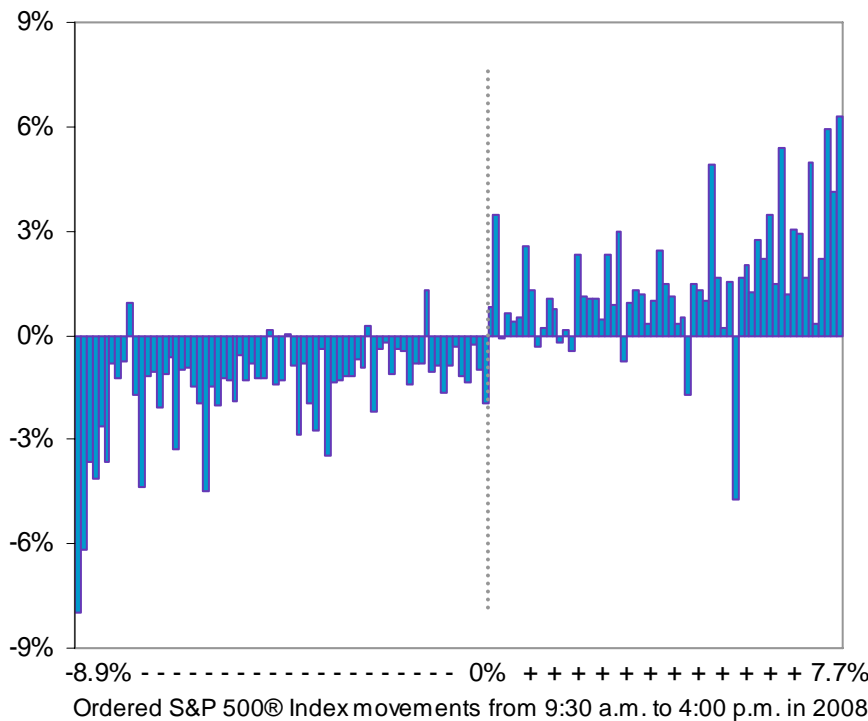
Model Performance Revisited

Absolute Distance Reduction per Volatility Quintile, 2004 to 2008

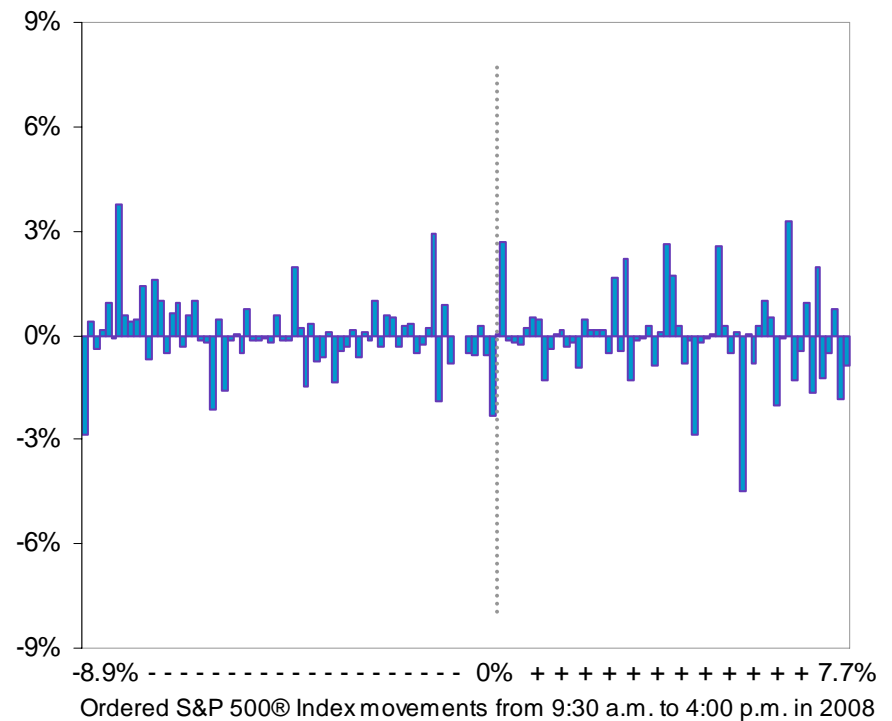


Predictable Tendencies Following the S&P 500® Index Examining Bias

Local750 and FairValue750 movements to the next day open, following days when the S&P 500® Index from 9:30 a.m. to 4:00 p.m. exceeded 100 bps in 2008

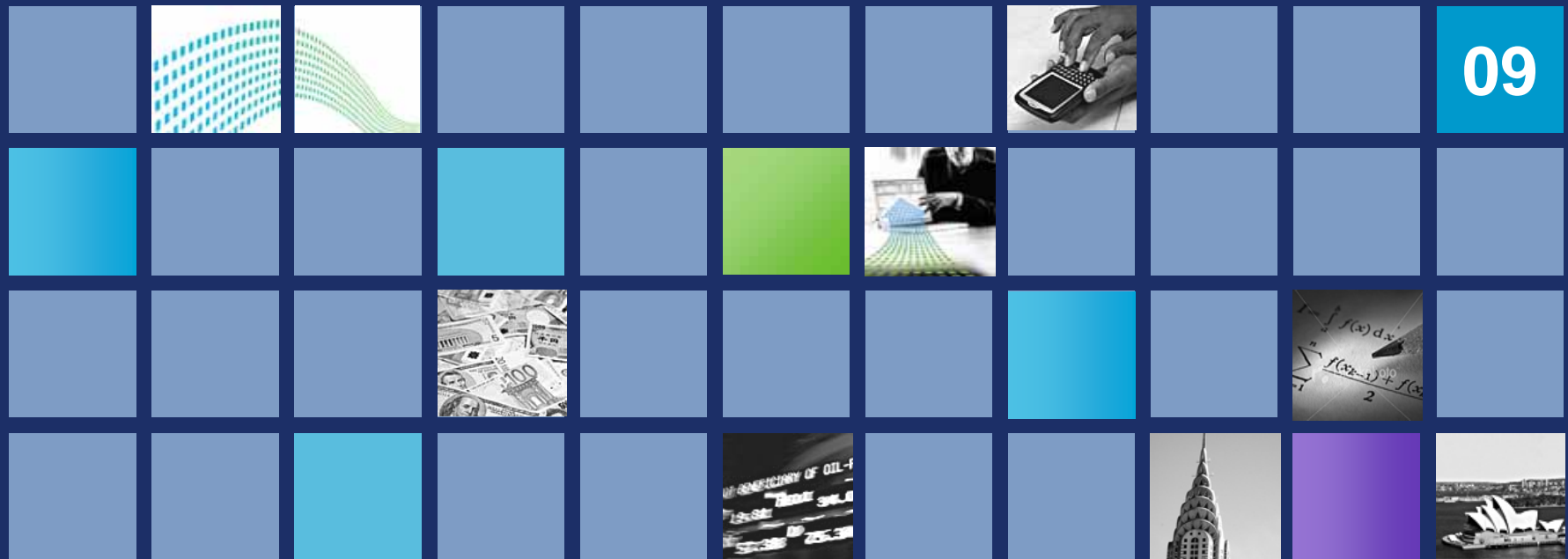


Local750 close to open moves in the same direction **90.2%** of the days



FairValue750 to open moves in the same direction **50.8%** of the days

Trends in Systematic Fair Valuation



The Concept of Trigger Levels

Trigger Levels

- Trigger Levels pertain to the magnitude of movement (e.g., 50 bps) in a relevant market indicator (e.g., S&P 500® Index) required to invoke a fund's fair value procedure
- Managing the decision of “when” to invoke a fair value procedure
- Back testing performance at various trigger levels to assist in the process of determining an appropriate trigger level
- What is the rest of the mutual fund industry doing?

Expanding on White Paper #13 – Assumptions

Selection of 182 International Funds

- Relied on Morningstar® data to assist in the selection process
 - 182 funds from separate fund families
 - “Foreign Large Blend” style and higher net assets under management
- Minimum of five years reporting NAVs
- Historical NAV returns, adjusted for dividends

Creating 74 Trigger Benchmarks

- FairValue750 & Local750 – foundation time series for comparison to fund returns
- Six Market Indicators spanning four “stale” time intervals – e.g., S&P 500® Index from London close to 4:00 p.m. (ET)
- Trigger Levels – 0 to 300 bps in increments of 25 bps, for each market indicator*

*(6 market indicators * 12 trigger levels) + 1 zero trigger level + 1 local close only series = 74 time series

White Paper #13 – The Correlation Horserace

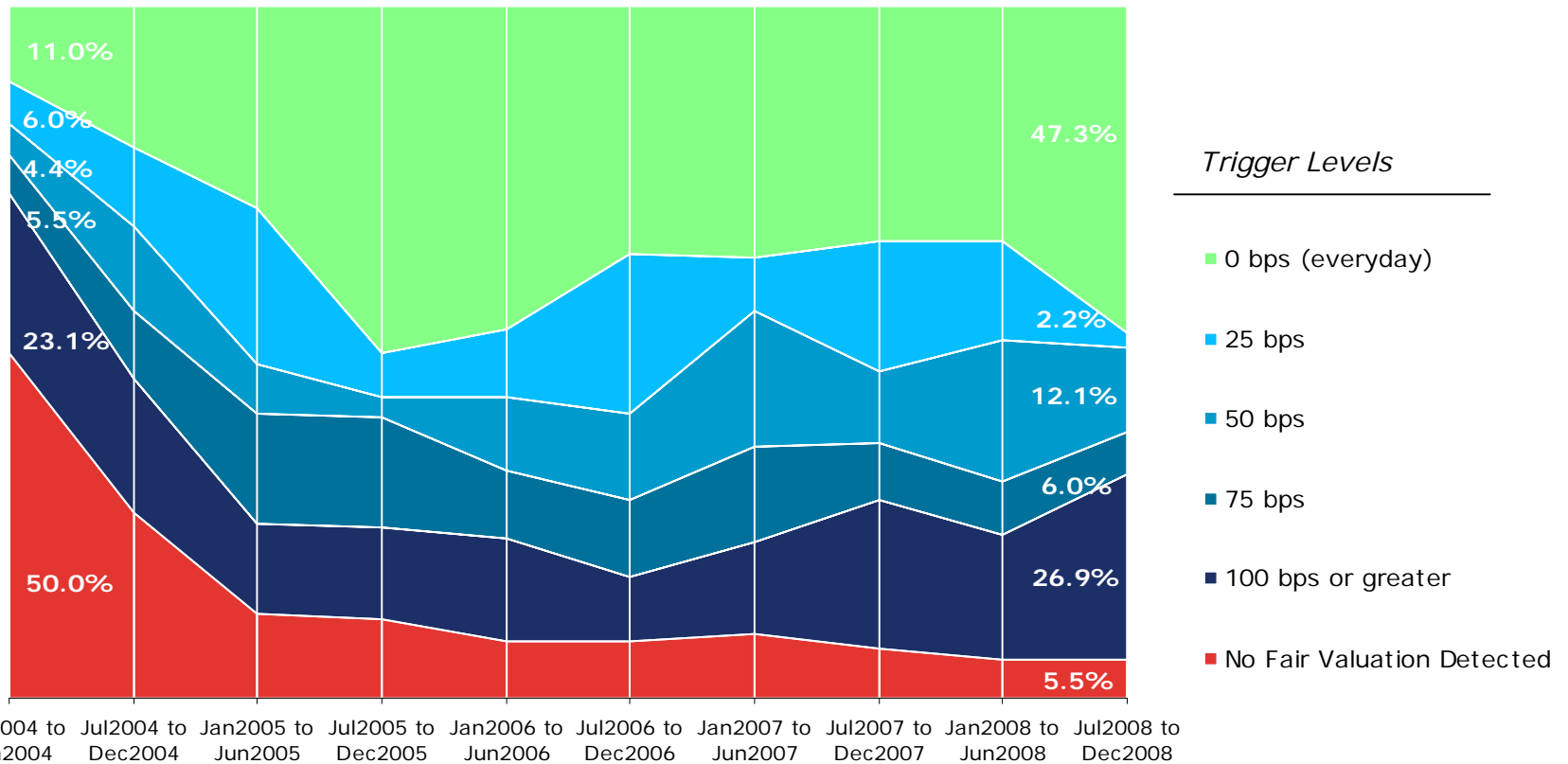
International Funds vs. Trigger Benchmarks

- Measured the correlation between each fund and the 74 trigger benchmarks
- The trigger benchmark with the highest correlation to the fund was the winner
- Conducted this test in six-month intervals, over a five-year period from 2004 to 2008
- Results suggest a trend towards more frequent usage of fair value methodologies
 - Currently, we estimate 94.5% of funds employing a systematic fair value methodology



What trigger levels are other funds using?

Estimating the Percentage of Fund Families Using Various Trigger Levels



*This illustration represents the percentage of international funds we estimated using each trigger level, based on public NAV data for 182 international funds. See Robert Haddad, White Paper #13, "What trigger levels are other funds using" (August 2007), for additional details.

Additional Trends in Fair Valuation

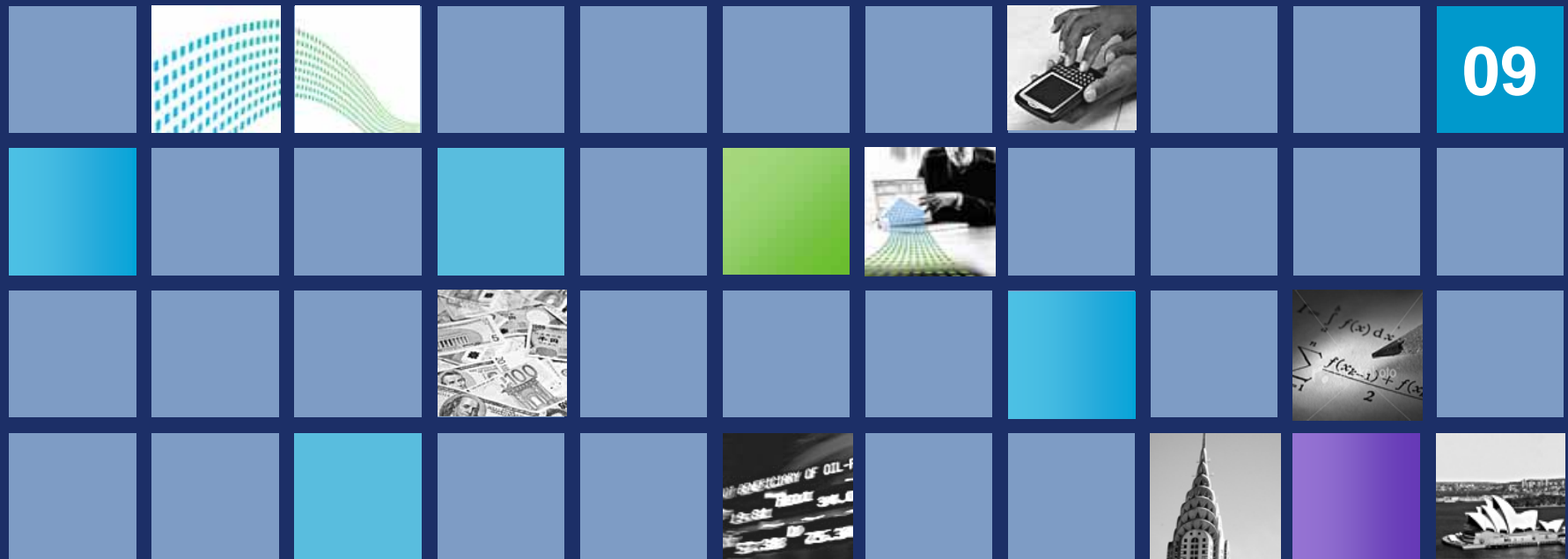
Extensions in Fair Valuation

- Fair Value Information Service for international equity index **futures** and international equity **options**
 - Now available (summer 2008)
- New valuation point at London noon (7 a.m. ET)
 - Now available (April 2009)

Other Considerations?

- Additional valuation points: 5 a.m. ET, 9 a.m. ET, 10 a.m. ET
- International fixed income securities?
- Intraday FVIS for international equities?

Fair Value Adjusted Benchmark Indices



More Frequent Fair Value Practices Suggest...

...Time for Fair Value Adjusted Benchmark Indices?

- Tracking error is a metric often used to measure risk in the fund
 - The higher the tracking error, the higher the *perceived* risk of the fund
 - i.e., fund taking on more volatility to achieve returns to shareholders
 - Tracking Error = Standard Deviation (Fund Returns – Benchmark Index Returns)
- Utilizing benchmark indices comprised of local closing prices does not lead to an apples-to-apples comparison
 - Leads to ↑ tracking error → ↑ *perceived* volatility → ↑ ***perceived* risk** in the fund

Example: Tracking Error Impacting Marketability of the Fund

Illustration:

- **Fund A** and **Fund B** are two similar international index funds investing in identical securities
- Fund A uses fair valuation everyday
- Fund B and the underlying benchmark index do not use a fair value methodology

Returns Comparison

- The annual return of Fund A, Fund B, and the benchmark index are all equal to **15%**

Tracking Error Comparison

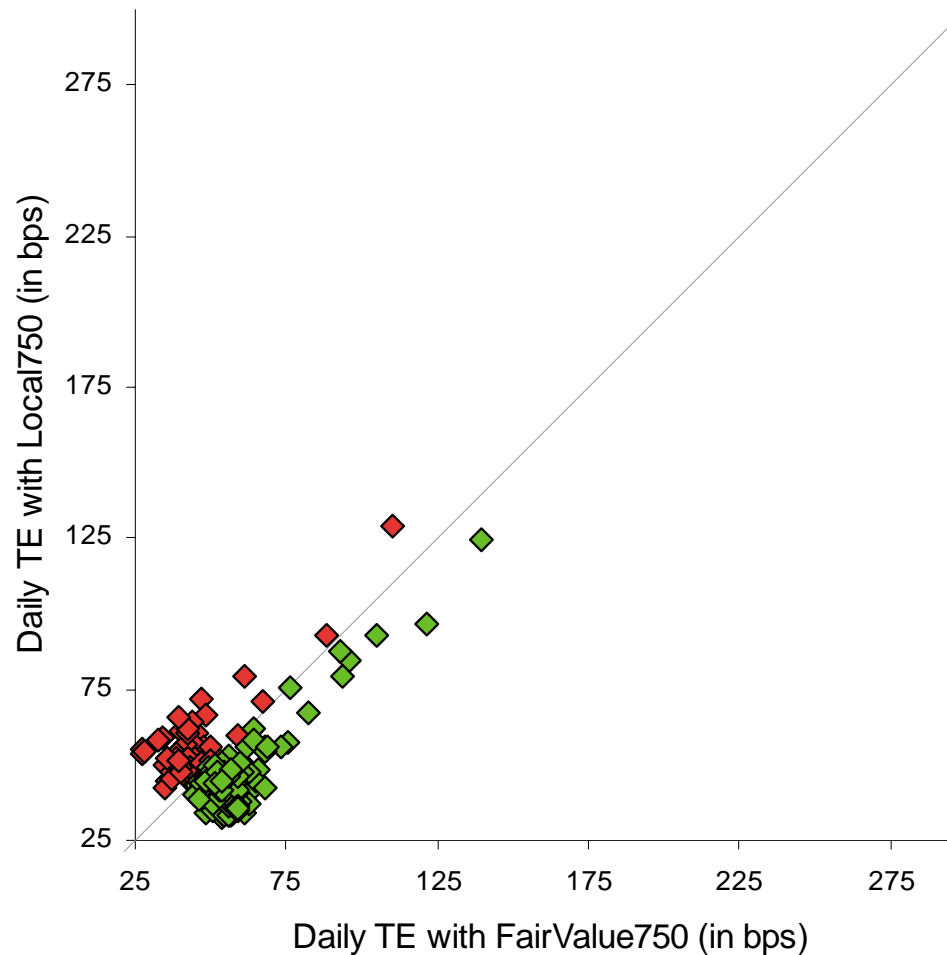
- Daily Tracking Error between Fund A and the benchmark is **1.00%**
- Daily Tracking Error between Fund B and the benchmark is **0.25%**

Which fund appears to have been a better investment choice?

- Although the annual returns are identical, the higher tracking error with Fund A creates a perception that more risk was taken to achieve those returns
-

Analysis of Tracking Error – 2004

Daily Tracking Error of 182 International Funds vs. Benchmark Proxies

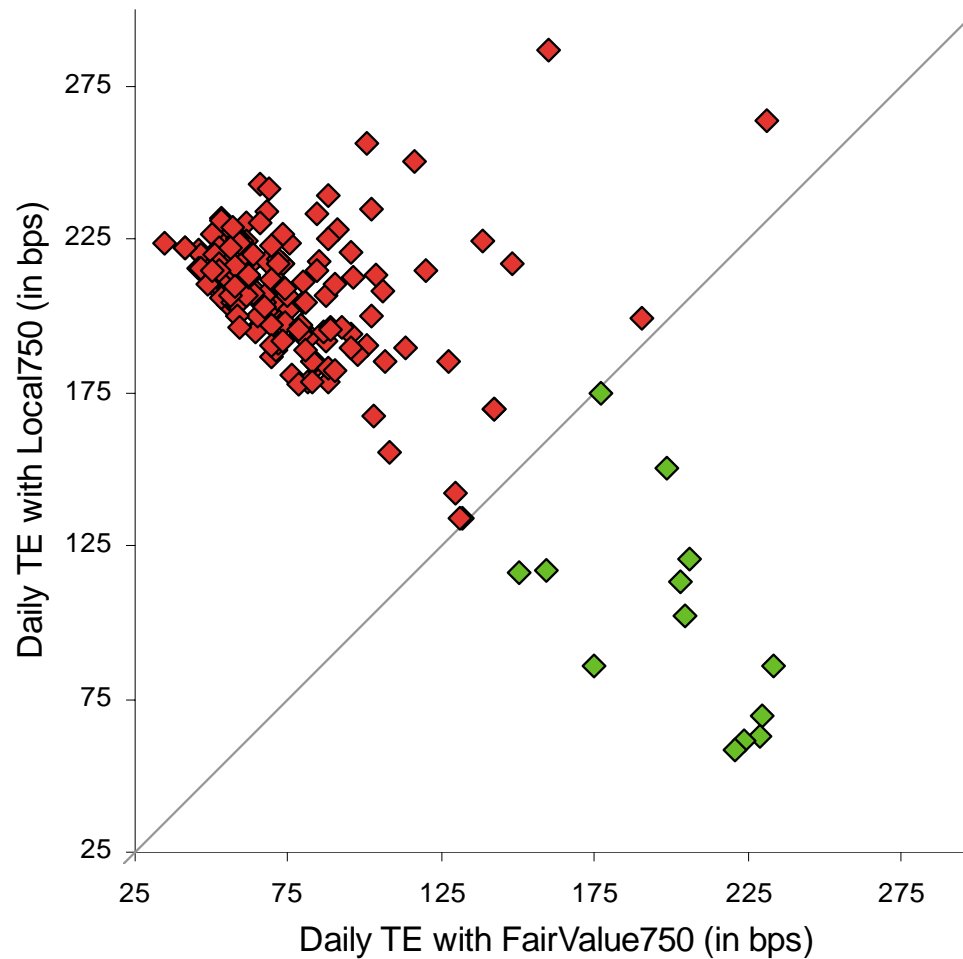


**Higher Tracking Error (TE)
with FairValue750, 65% of the time**

*Median TE with Local750 = 47 bps
Median TE with FairValue750 = 52bps*

Analysis of Tracking Error – 2008

Daily Tracking Error of 182 International Funds vs. Benchmark Proxies



Over 92% of funds with higher Tracking Error (TE) to Local750

Median TE with Local750 = 208 bps
Median TE with FairValue750 = 72 bps

In Closing...

- Strong performance of Fair Value Information Service for international equities in volatile markets
- We estimate that utilizing a trigger to invoke fair valuation procedures vs. the everyday approach is virtually a toss-up amongst funds (estimated at 47% vs. 47%, respectively)
- Nearly 95% of funds estimated to employ a systematic approach to fair valuation
- Interest in extending use of systematic fair valuation to different asset classes and using additional evaluation points for global equities
- Given the frequent practice of fair valuation within international funds, extending the concept of fair valuation to benchmark indices makes sense

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