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Exploring Developed & Emerging Market Country Allocation for Equities

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Agenda

- **Approaches for building country allocation models for equities**
  - Macro economic signals
  - Bottom-up aggregate fundamental and market signals

- **Forecasting horizon of the signals**

- **Compare and contrast developed and emerging markets**

- **Establishing benchmarks**
  - Capitalization-weighted indices
  - Equal-weighted indices
  - Minimum variance indices

- **Portfolio construction techniques**
  - Alpha model of derived signals
  - Managed volatility approach

Tools And Data

- **ClariFI® Strategy Simulation and Portfolio Construction Platform, including**
  - Aggregate Country Level Back-Tester
  - Mean-Variance Optimizer
  - S&P Capital IQ Global Risk Model with Country Index Coverage

- **S&P Global BMI Index (including Developed and Emerging) as well as constituent country indices**
  - BMI total return index used as a proxy of country return

- **S&P Capital IQ Global Point-in-Time (PIT) fundamentals**
  - Natively collected PIT data set with broad geographic and financial statement item coverage
  - Company PIT fundamentals aggregated to represent detailed country aggregate fundamentals

- **Global Insight macroeconomic indicators**
  - Lagged 6 months to address look-ahead bias arising from revisions

- **Date Range: Developed: Dec. 1994 – Jan. 2014
  Emerging/Global: Dec. 1999 – Jan. 2014**

- **Transaction costs not explicitly considered**

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Related Papers

- **Solnik (1993) found that country returns could be forecasted by using lagged country-level valuation measures and macroeconomic fundamentals; Balvers, Wu, and Gilliland (2000) extended Solnik's work by demonstrating that country returns are mean reverting**

- **Evidence of momentum as a predictive factor: Miffre and Rallis (2007) and Erb and Harvey (2006) have observed the momentum effect in commodities. Asness et al (2012) find momentum effects within a wide variety of asset classes, while Desrosiers et al (2004) find evidence of momentum effects specifically within equity country allocation**

- **Chen, Roll, and Ross (1986) found that several economic variables were significant in explaining U.S. stock market returns, most notably industrial production and twists in the yield curve**

- **Patro, Wald, and Wu (2000) found that Exports/GDP was significant for prediction international stock market returns**

- **Many studies have pointed out that macro-economic variables are affected by data uncertainty and publication lags and revisions make it difficult to ascertain the forecasting value of macro-economic variables, e.g. Christoffersen, Ghysels, and Swanson (2001) and Banbura and Runstler (2007) and Ghysels, Horan, and Moench (2012)**

- **Aruoba (2006) found that initial announcements by statistical agencies are biased and revisions are predictable using information from the time of the initial announcement**

Please see reference addendum page at the end of this presentation.

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# Index Performance Last 12 Months Vs. Forecast GDP Growth

■ BMI Index (USD), 2/2013 - 2/2014　　**■ Real GDP Growth, 2014 Est.**
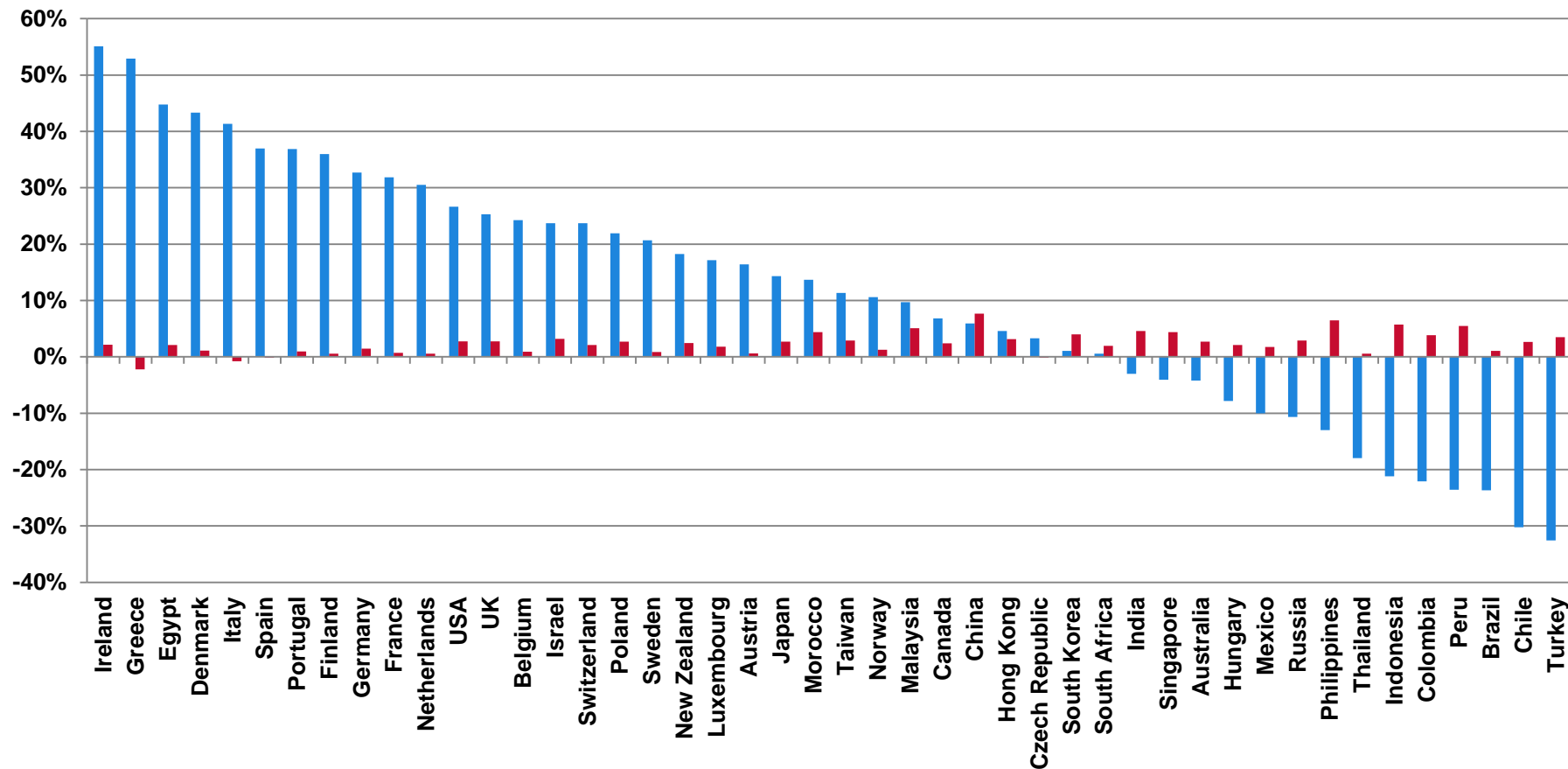
Source: S&P Dow Jones Indices, Global Insight, The Economist. Information as of Feb 28, 2014. Indexes are unmanaged, statistical composites and it is not possible to invest directly in an index.

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Correlation Between Macro-Economic Data And Aggregated Company Financials

Revenue Growth Vs. GDP Growth
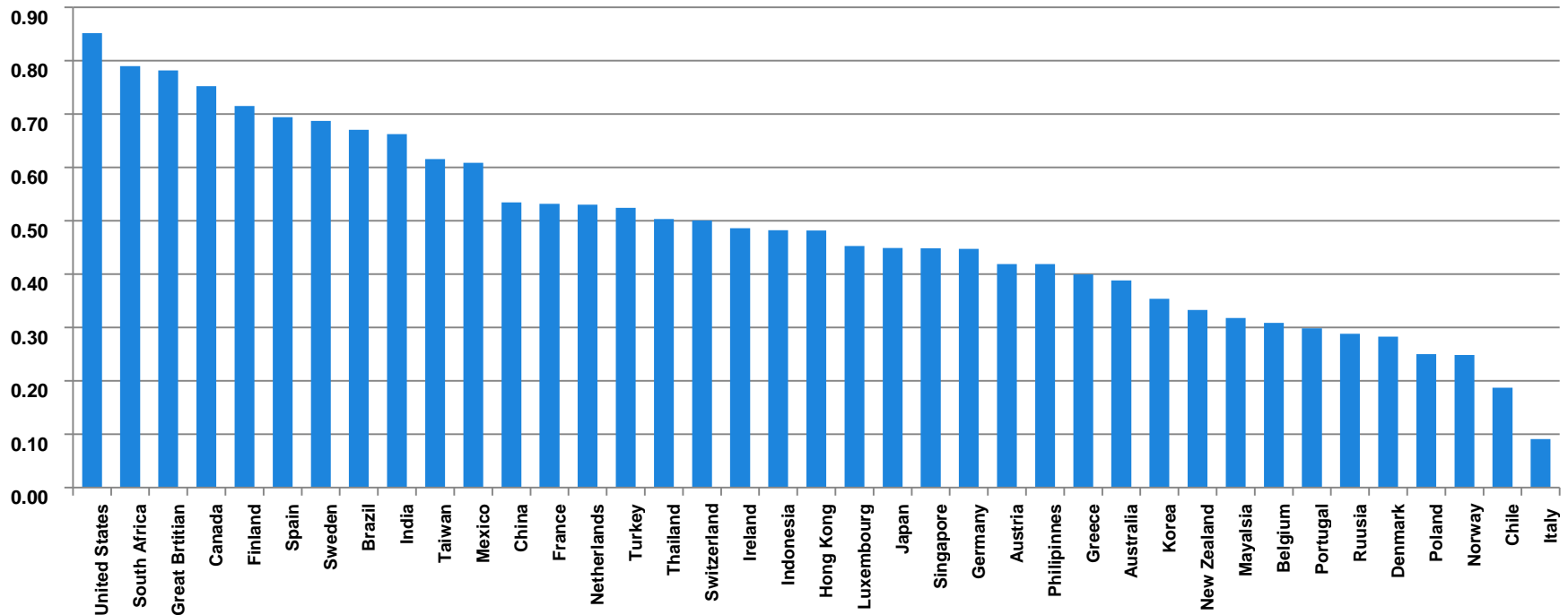
- **Mixed correlation between macro-economic estimates of GDP growth and bottom up aggregation of index constituent revenue growth**

- **Even for countries where filings tend to appear relatively late, bottom-up aggregates can yield more timely and relevant estimates of country fundamentals than macroeconomic estimates**

Countries Included In The Analysis (Latest)

Developed		Emerging
Australia	Ireland	Brazil
Austria	Israel	Chile
Belgium	Italy	China
Canada	Japan	Indonesia
Switzerland	South Korea	India
Germany	Luxembourg	Mexico
Denmark	Netherlands	Malaysia
Spain	Norway	Philippines
Finland	New Zealand	Poland
France	Portugal	Russia
UK	Singapore	Thailand
Greece	Sweden	Turkey
Hong Kong	USA	Taiwan
		South Africa

- **We consider the full developed universe but have excluded 13 of the smaller emerging markets from the analysis due to lack of comprehensive historical fundamental data**

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Summary Of Factor Information Coefficients

	Developed	Emerging
Value		
FCF/Price	0.034* [3]	×
EBITDA/EV	×	0.046** [5]
Div. Yield	×	0.033* [1]
Earnings Quality		
CF Accruals	0.022 [1]	×
Net Profit Margin	×	0.045** [4]
Capital Efficiency		
ROA	0.042*** [2]	0.047** [4]
Momentum		
9M Momentum	0.056*** [3]	0.042* [10]
Macro Economic		
Unemp. (Y-o-Y chg)	-0.035** [3]	×
FX Rate (3M chg)	0.028 [2]	0.057** [1]
FX Rate (1Y chg)	0.041** [9]	×

- **Several aggregate fundamental factors and some macro-economic indicators have statistically significant forecasting power with respect to country level returns**

  – However historical growth whether measured by Sales, Earnings or GDP did not produce statistically significant return forecasts

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CDS Spreads: 6-month Change in CDS Spread (mid-point)

Data Point counts

Factor Data Point counts

Legend: — Issue Counts — Data Point Counts
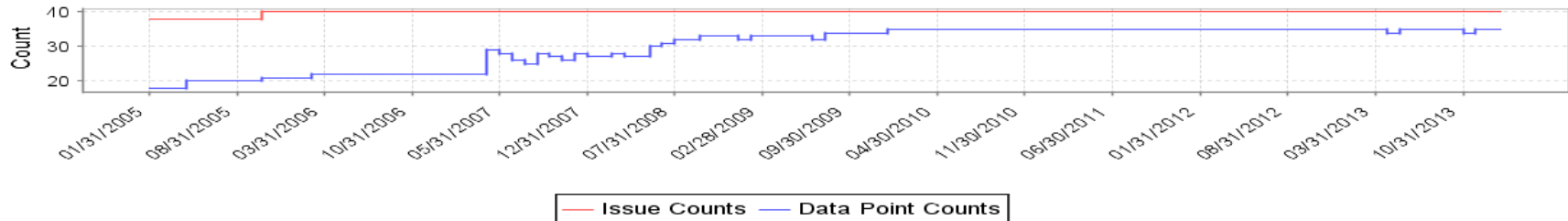
Objective Statistics For Holding Period

Holding Period	Avg. IC	IC T-Statistic
1 Month	-0.089	-3.599
2 Months	-0.066	-2.566
3 Months	-0.057	-2.166
4 Months	-0.06	-2.37
5 Months	-0.089	-3.666
6 Months	-0.082	-3.265
7 Months	-0.055	-2.129
8 Months	-0.075	-2.886
9 Months	-0.076	-3.161
10 Months	-0.046	-1.971
11 Months	-0.062	-2.607
12 Months	-0.065	-2.639

Active Cumulative Returns by Quantile

☑ Active Return Top Bottom Spread

Cumulative Active Returns

Legend: — Quantile 1 — Quantile 2 — Quantile 3 — Top Bottom Active Return Spread
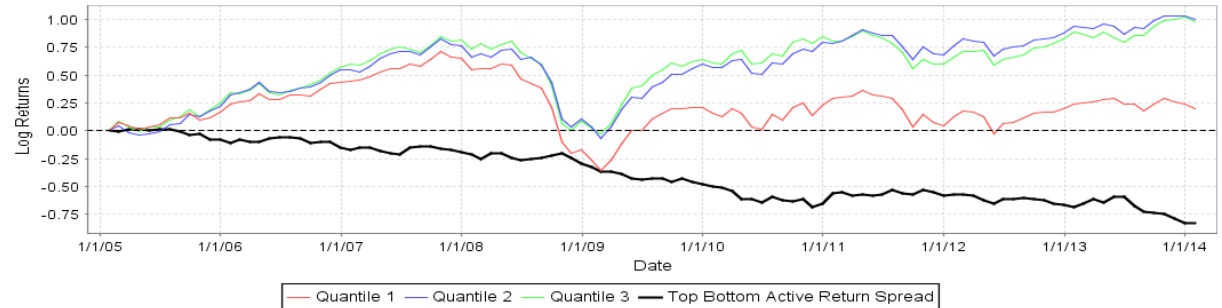
Yearly Top-Bottom Return Spread Per Holding Period

Yearly Top-Bottom Return Spread
Region Interaction : All

Legend: ■ 1 Month
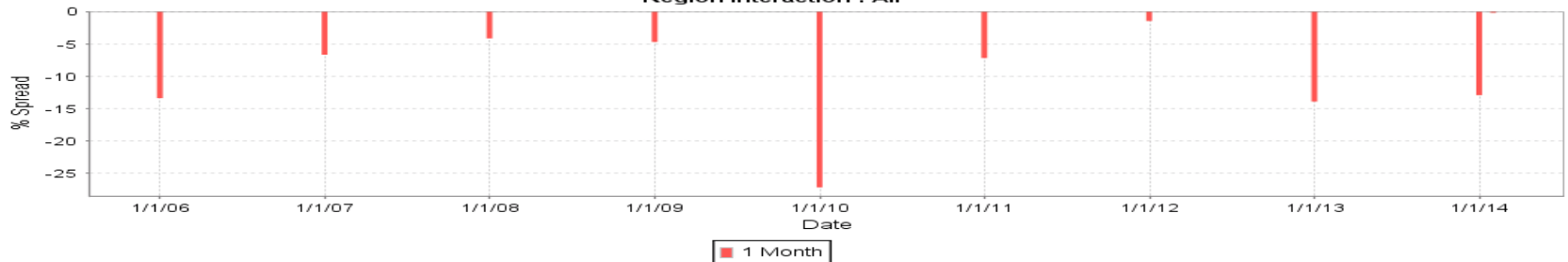
Source: S&P Capital IQ, ClariFI information as of February 28 2014.

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Valuation Factors

Developed (FCF/Price) — Information Coefficient Decay and Information Coefficient charts; Emerging (EBITDA/EV) — Information Coefficient Decay and Information Coefficient charts.
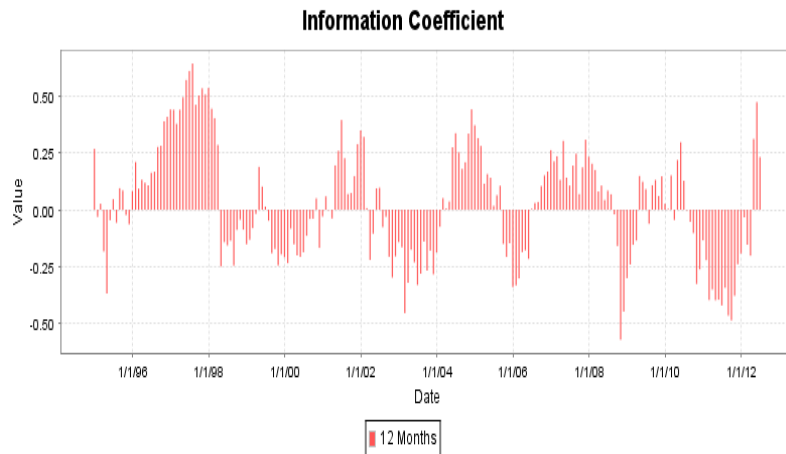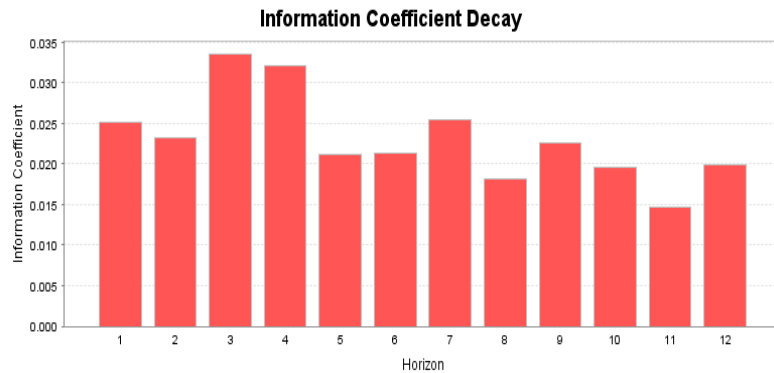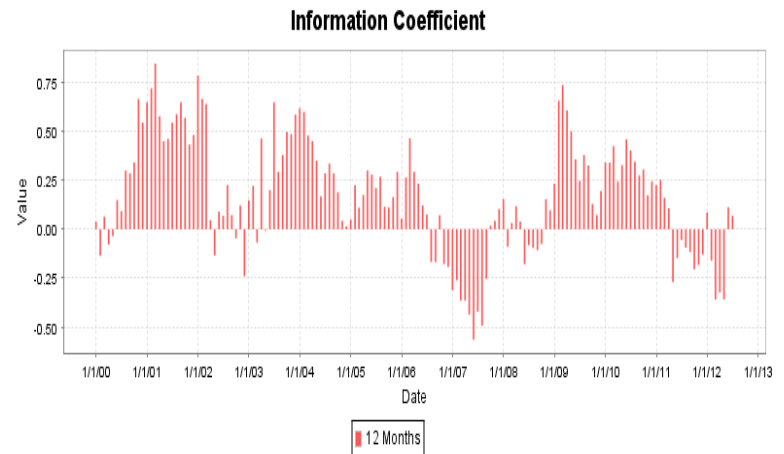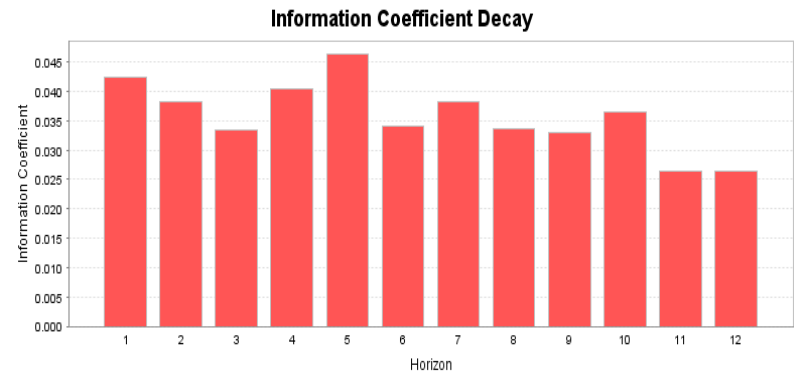
Source: S&P Capital IQ, ClariFI information as of June 30, 2013.

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Dividend Yield
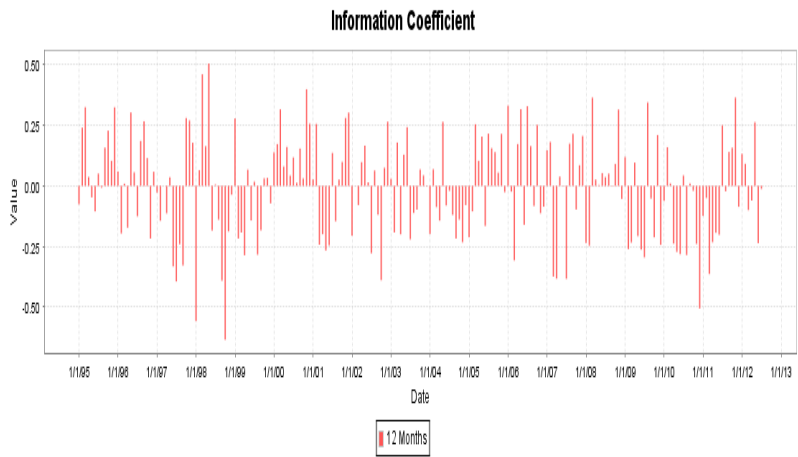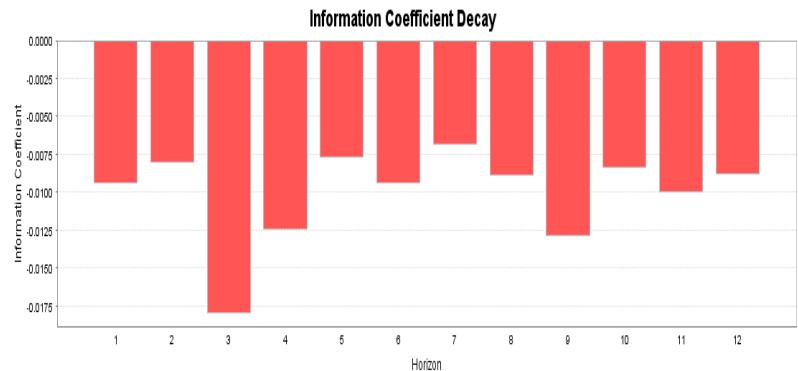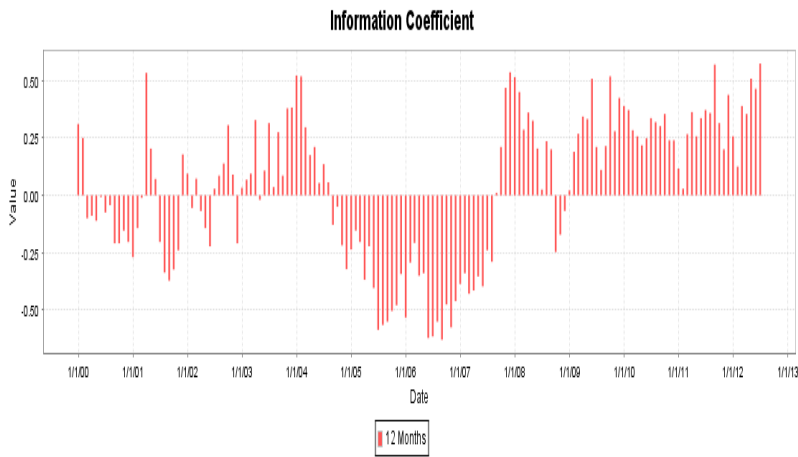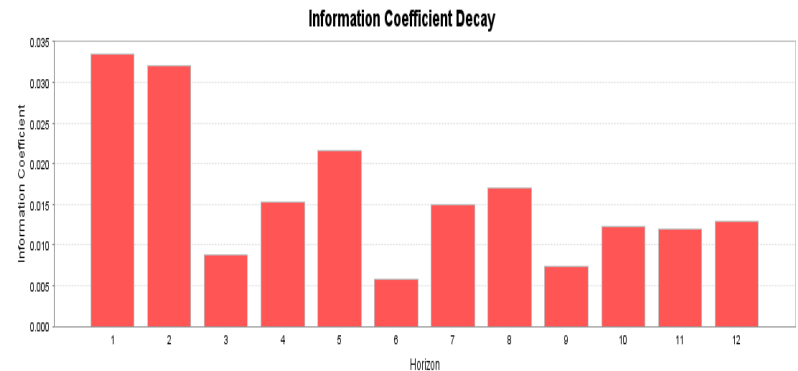
Source: S&P Capital IQ, ClariFI information as of June 30, 2013.

Capital Efficiency
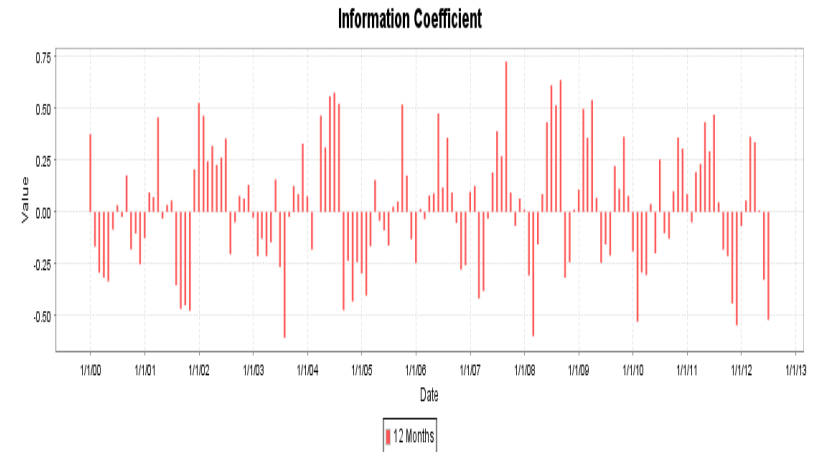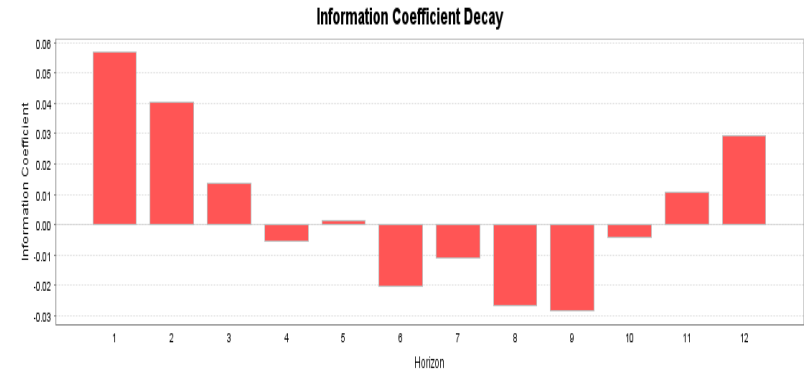

Developed (Return on Assets)

Information Coefficient Decay

Information Coefficient
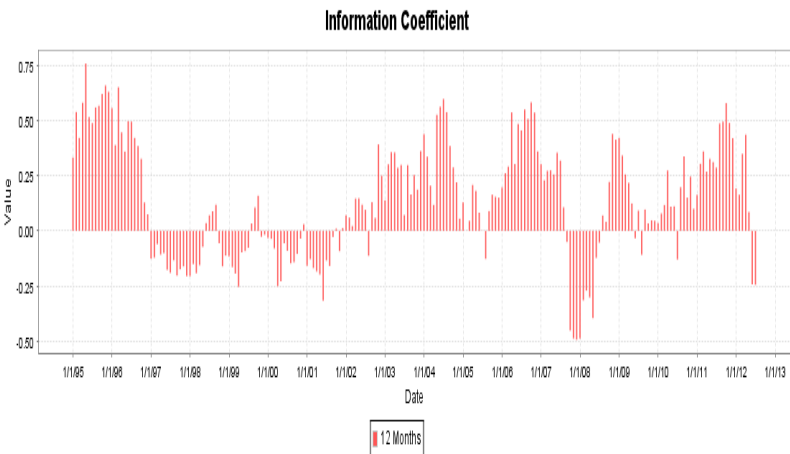
Emerging (Return on Assets)

Information Coefficient Decay

Information Coefficient

Source: S&P Capital IQ, ClariFI information as of June 30, 2013.

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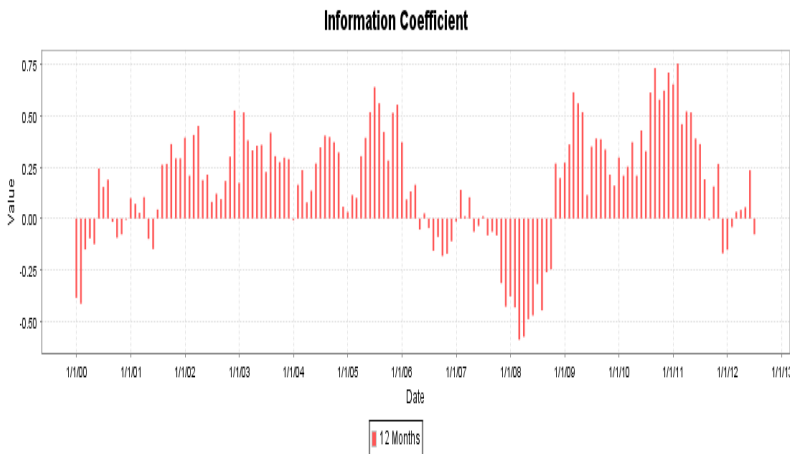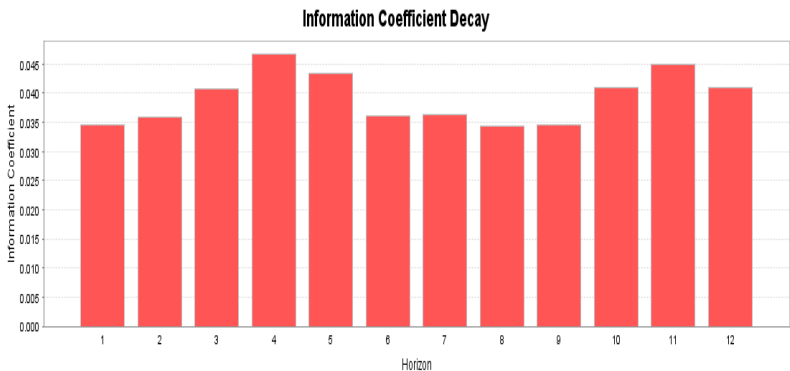
FX Rate (Three Months Change To USD)
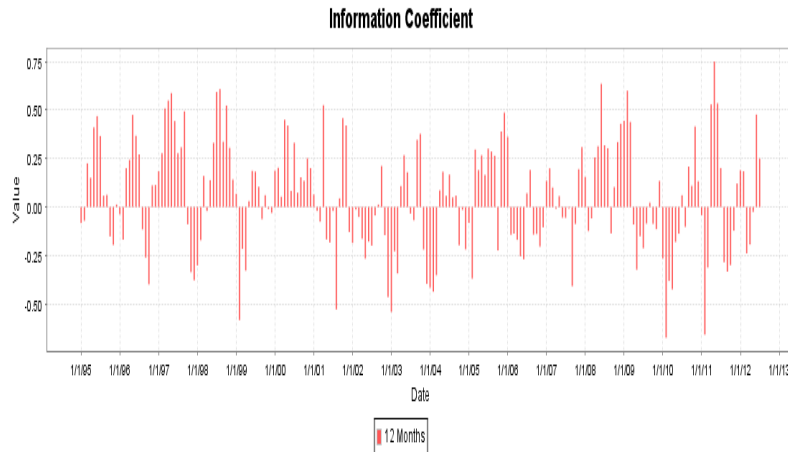
Source: S&P Capital IQ, ClariFI information as of June 30, 2013.

Recent Performance Of The Volatility Style In Alpha Factor Library
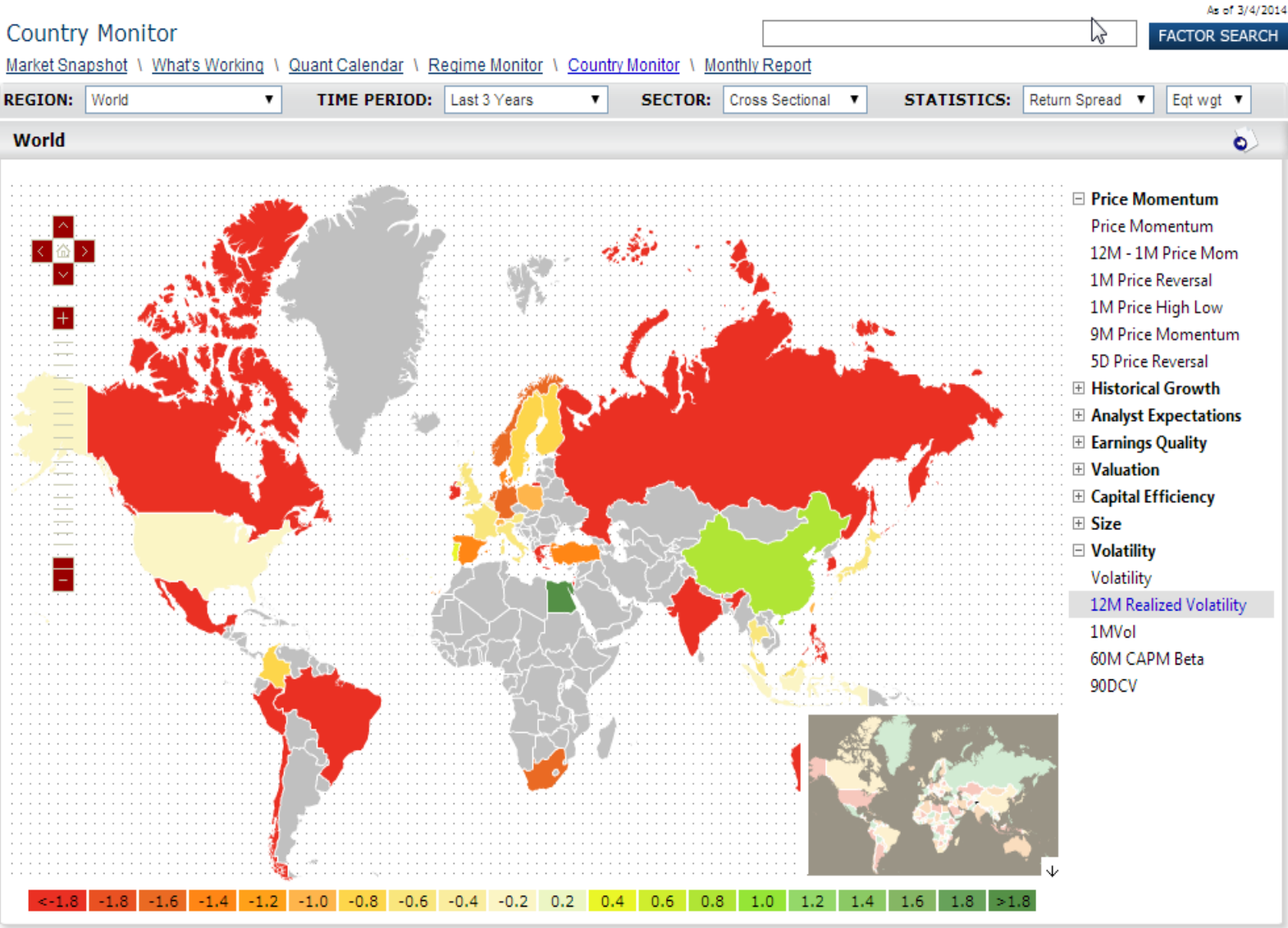
Source: Alpha Factor Library information as March 4, 2014.

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Rising Correlations: Increasingly Important For Risk Management

Average Pairwise Country Return Correlation

- **Emerging Markets**
- **Developed Markets**
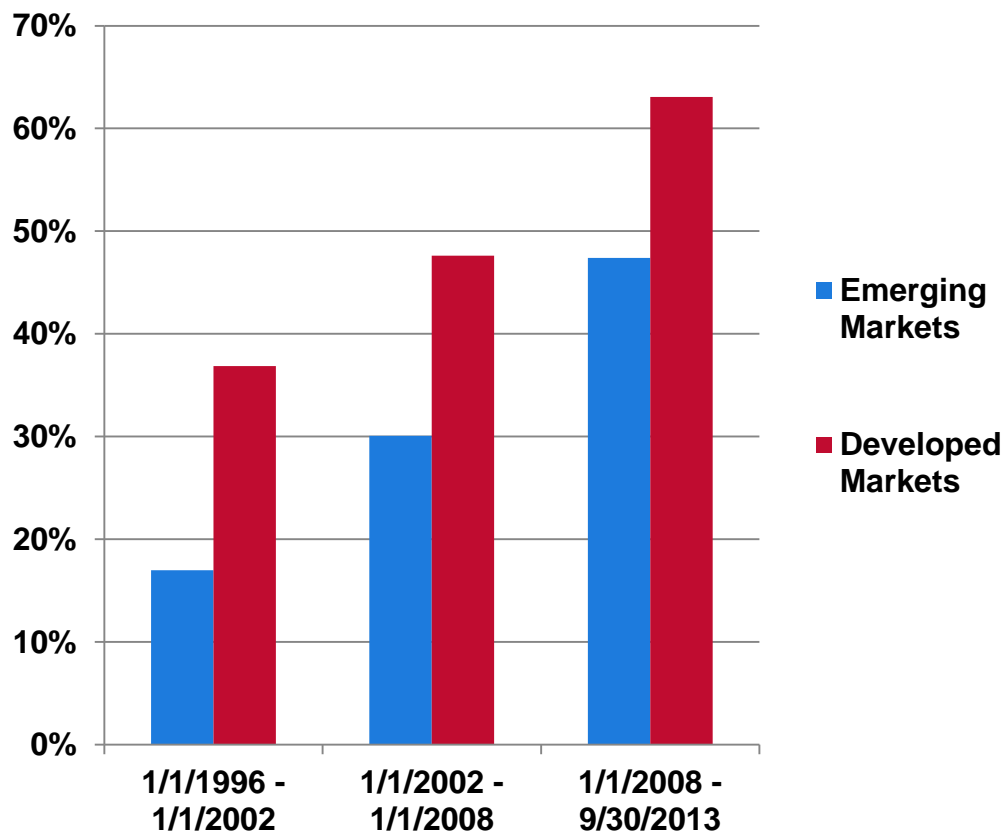
Highest/Lowest Pairwise Country Return Correlation (9/12 – 9/13)
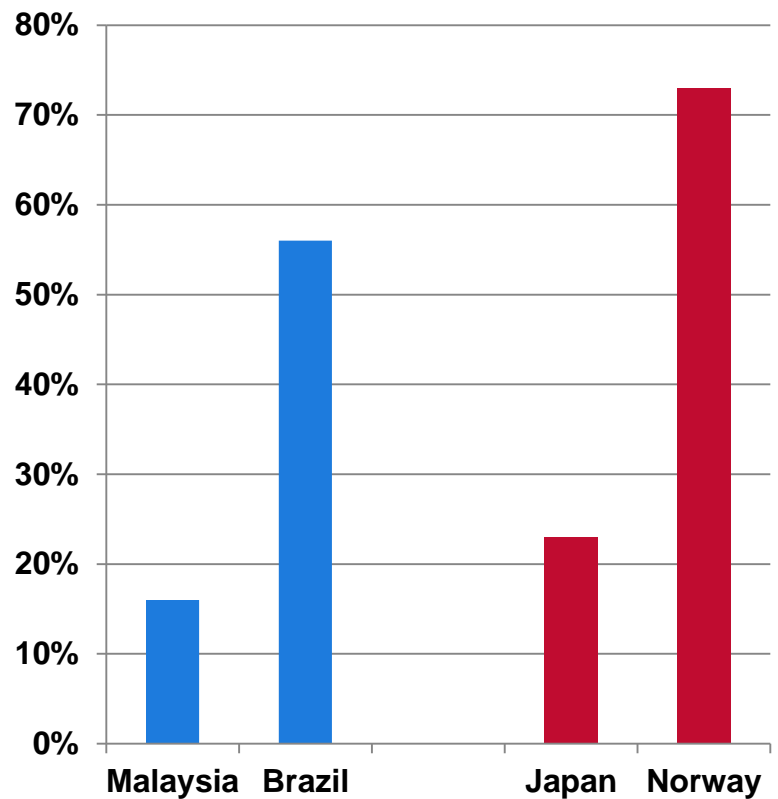
Source: S&P Capital IQ, ClariFI information as of August 31, 2013. Correlations are based on daily returns.

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Establishing Benchmarks: Cap. Weighted And Minimum Variance

Developed
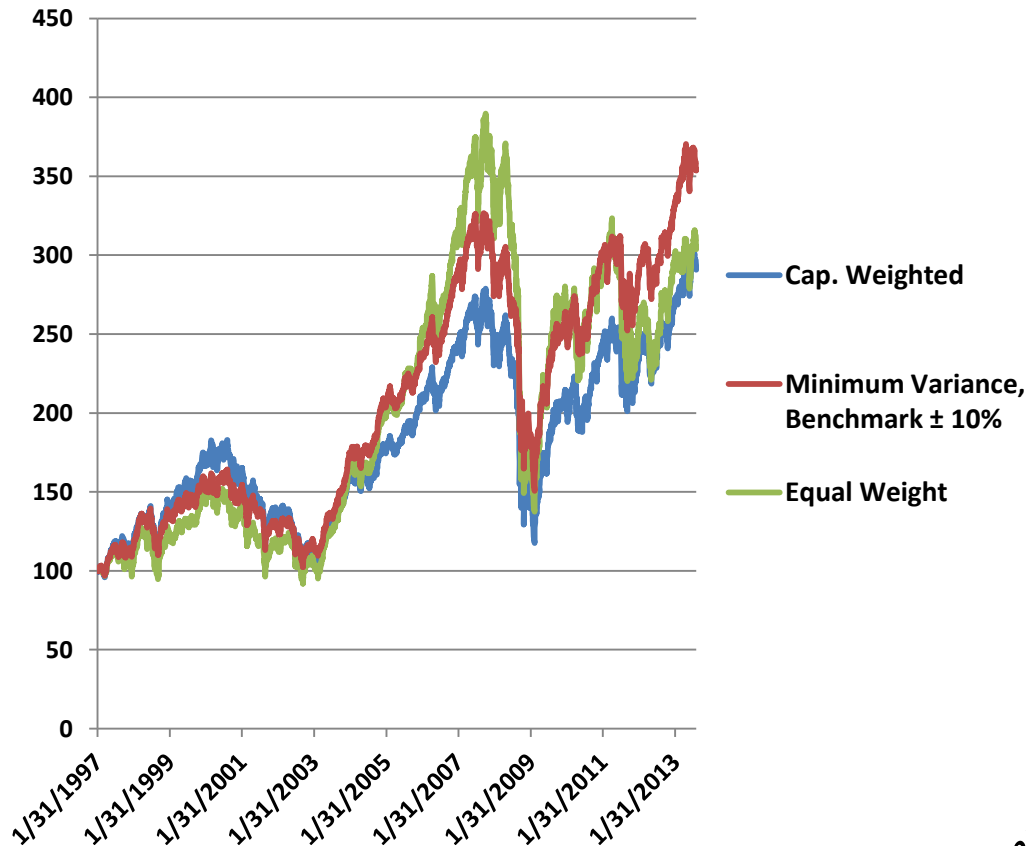
Emerging

Cap. Weighted

Minimum Variance, Benchmark ± 10%

Equal Weight
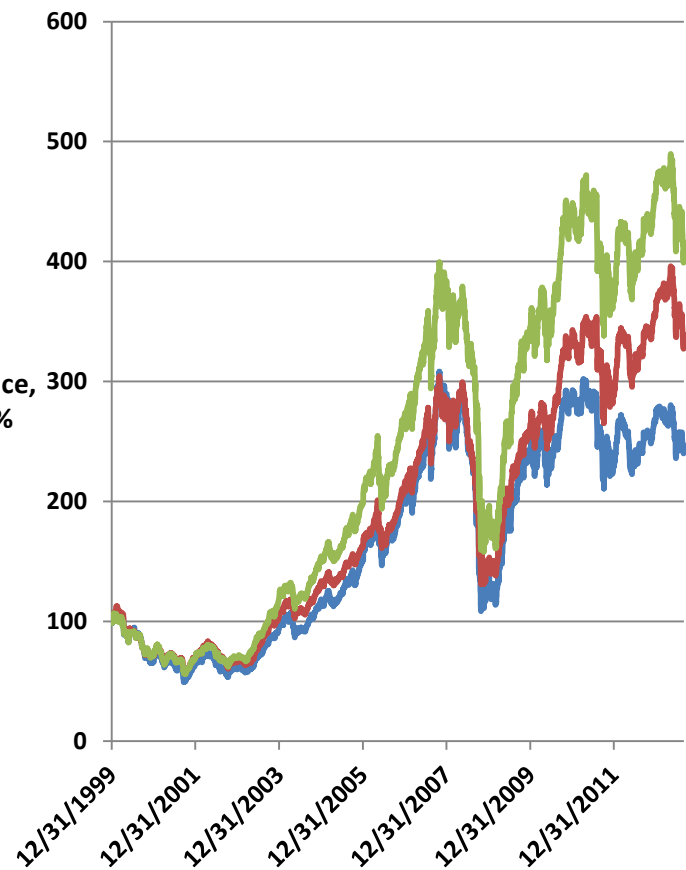
Note: USD based returns.
Source: S&P Capital IQ, ClariFI information as of January 31, 2014. For Illustrative purposes only. Past performance is not indicative of future results. Indexes are unmanaged, statistical composites and it is not possible to invest directly in an index.

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Minimum Variance Active Weights: Developed Markets

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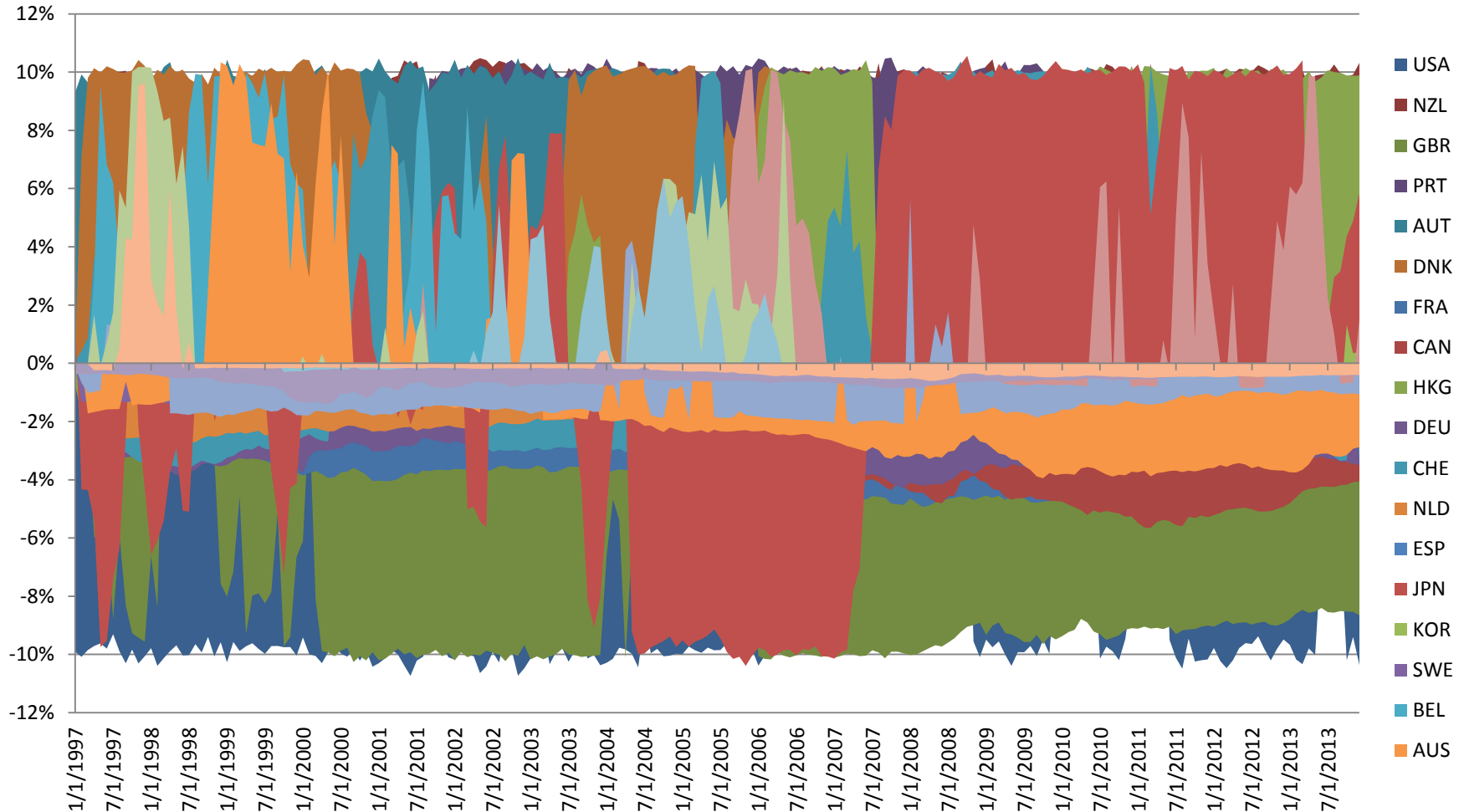
Minimum Variance Active Weights: Emerging Markets

Legend: MYS, CHL, BRA, PHL, ZAF, MEX, RUS, THA, CHN, IND, TUR, POL, IDN, TWN

Source: S&P Capital IQ, ClariFI information as of January 31, 2014.

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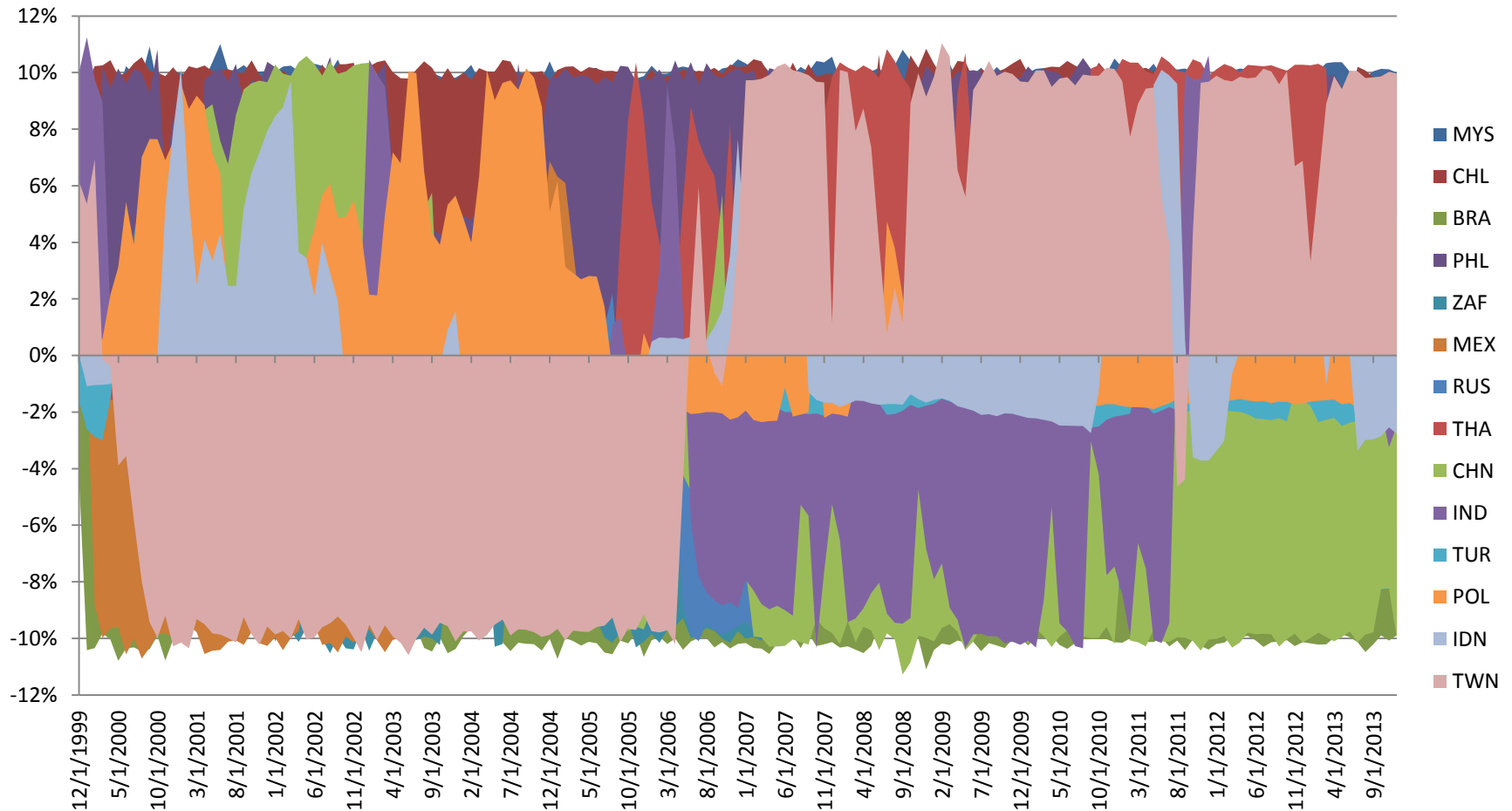
Min. Variance Active Weights vs. Country Index Volatility

Developed
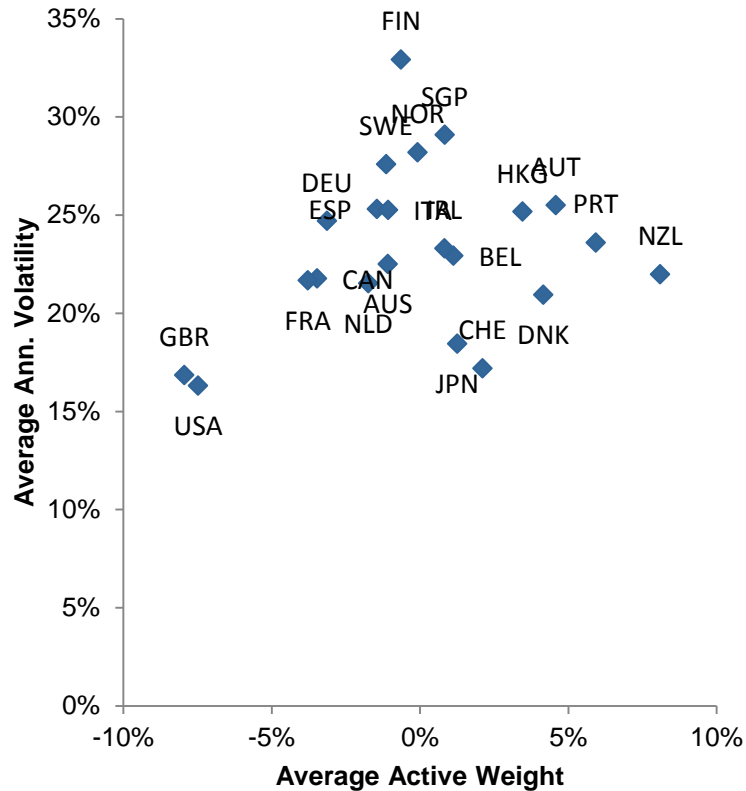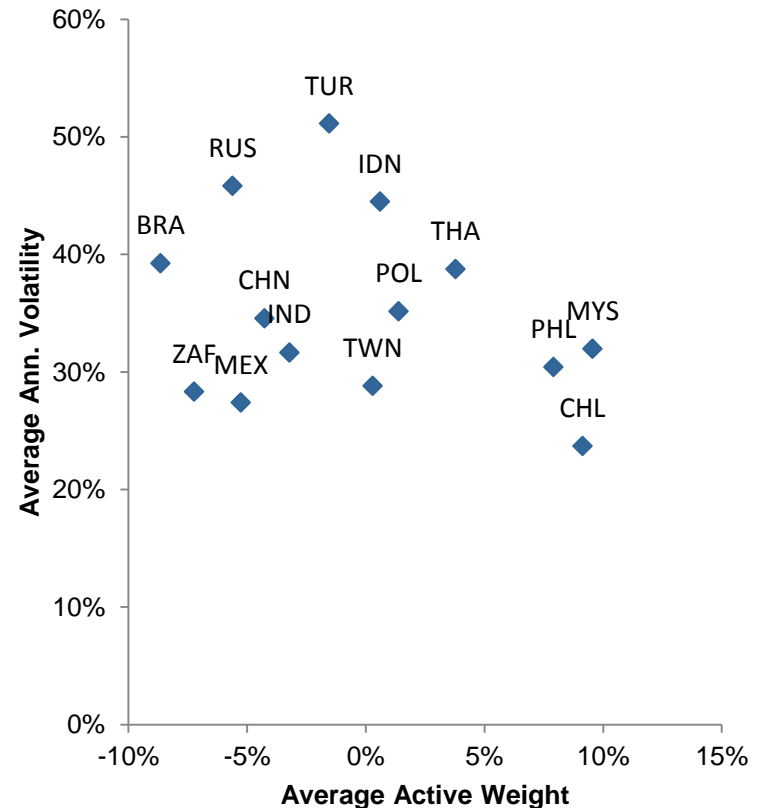
Average Ann. Volatility vs. Average Active Weight

Data points: FIN, SGP, NOR, SWE, DEU, ESP, HKG, AUT, ITA, PRT, NZL, BEL, CAN, AUS, FRA, NLD, CHE, DNK, JPN, GBR, USA

Emerging

Average Ann. Volatility vs. Average Active Weight

Data points: TUR, RUS, IDN, BRA, THA, CHN, POL, IND, ZAF, MEX, TWN, PHL, MYS, CHL

Note: USD based returns.
Source: S&P Capital IQ, ClariFI information as of January 31, 2014

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Building Equal Weighted Models For Developed And Emerging Markets

Developed	Emerging
	EBITDA/EV
FCF/Price	
	Dividend Yield
CF Accruals	Net Profit Margin
ROA	ROA
9M Momentum	9M Momentum
FX Rate 1Y Chg	FX Rate 3M Chg

- **Portfolio Construction Objective: Build Cap. Weighted Benchmark Relative Portfolios which maximizes the equal weighted sum of the country rankings for each factor in the respective model**

- **Constraints**

  - Country weight: Benchmark Weight ± 10%

  - Annual turnover: Max. 120% (one-way)

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Model Performance Relative To Cap. Weighted Benchmarks

Developed
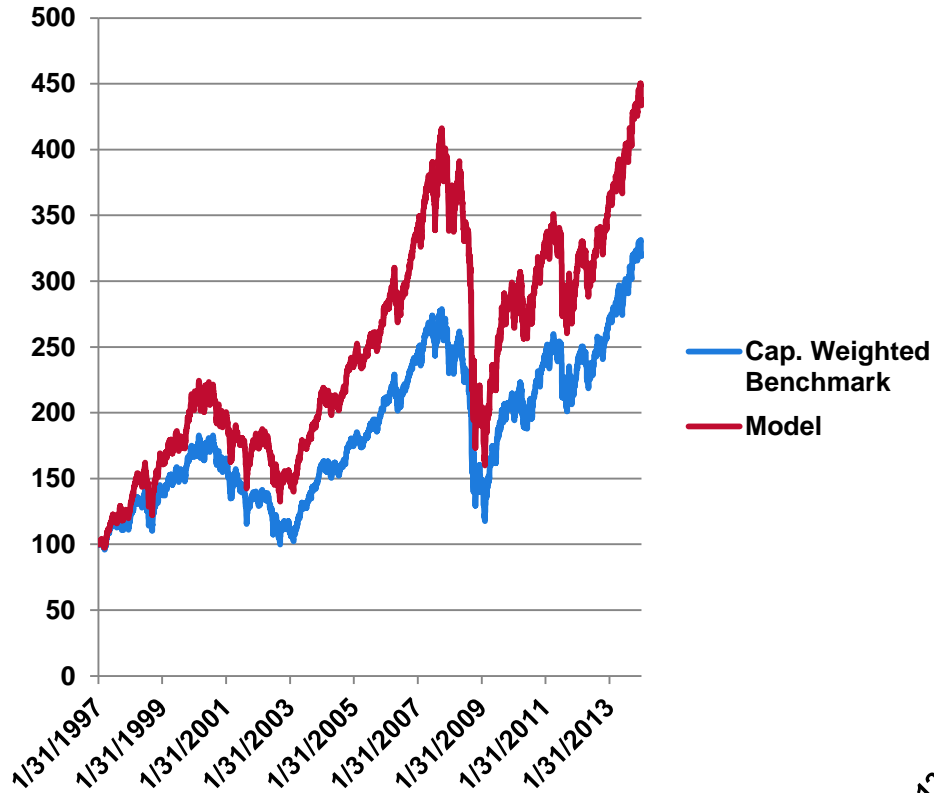
Emerging
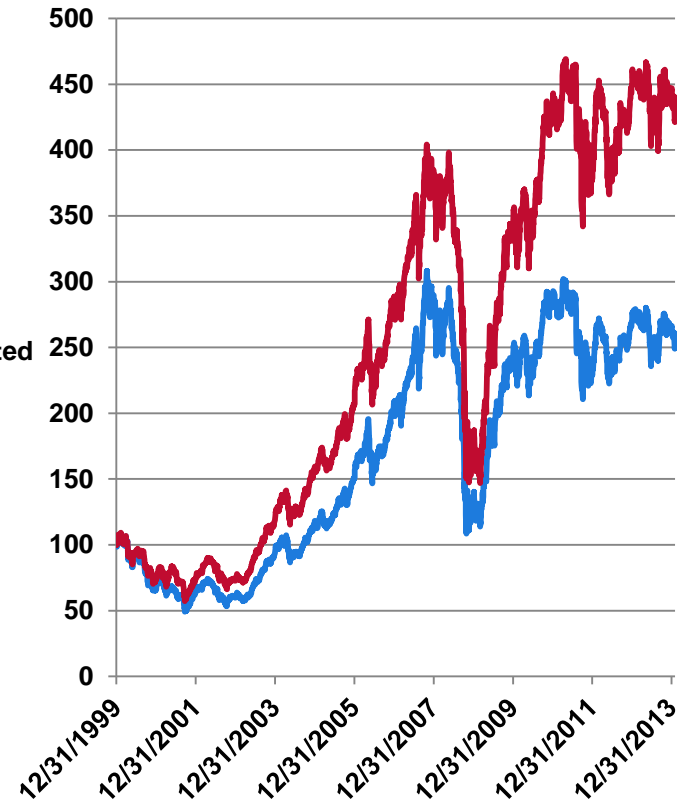
Legend:
- Cap. Weighted Benchmark
- Model

Note: USD based returns.

Source: S&P Capital IQ, ClariFI information as of January 31, 2014. Indexes are unmanaged, statistical composites and it is not possible to invest directly in an index.

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Effect Of Adding Volatility Management

Developed

Emerging

- Base Model
- Model (Vol. Constraint)
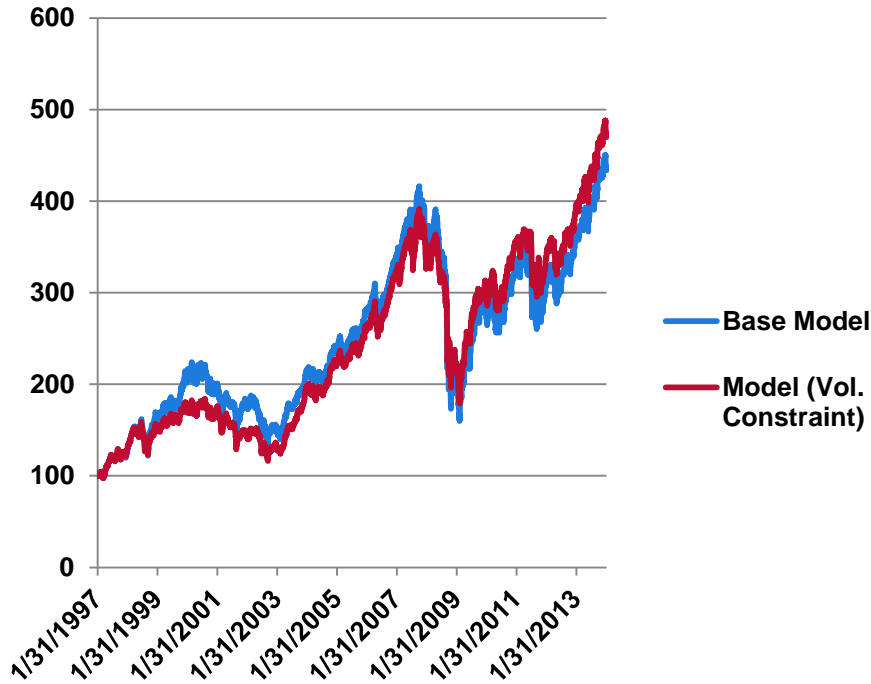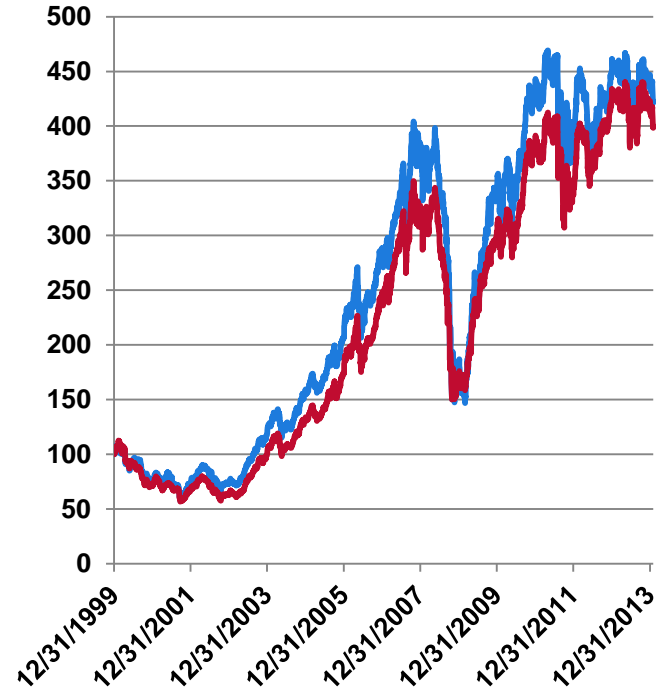
- **Effect of adding a total volatility constraint at around 5% less than realized benchmark volatility**

  - Developed: 12.5%

  - Emerging: 15%

Note: USD based returns.
Source: S&P Capital IQ, ClariFI information as of January 31, 2014. Indexes are unmanaged, statistical composites and it is not possible to invest directly in an index.

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Performance Summary

|	Compound Ann. Return	Ann. Risk	Compound Return/Risk Ratio	Ann. Tracking Error	Ann. One-Way T/O
Developed (Dec. 1994 – Jan. 2014)					
Cap. Weighted Benchmark	7.1%	16.6%	0.43	0	0
Equal Weight	7.5%	18.5%	0.40	10.1%	22%
Minimum Variance	8.3%	13.6%	0.61	5.3%	111%
Base Model	9.0%	17.6%	0.51	4.6%	109%
Managed Vol. Strategy (12.5% Vol. Constraint)	9.5%	14.2%	0.67	5.1%	83%
Emerging (Dec. 1999 – Jan. 2014)					
Cap. Weighted Benchmark	6.7%	19.6%	0.34	0	0
Equal Weight	10.5%	17.7%	0.59	5.9%	32%
Minimum Variance	9.2%	15.6%	0.59	7.7%	67%
Base Model	10.7%	19.9%	0.54	6.4%	107%
Managed Vol. Strategy (15% Vol. Constraint)	10.3%	16.2%	0.64	7.3%	96%

Note: USD based returns.

Source: S&P Capital IQ, ClariFI information as of January 31, 2014. Past Performance is no guarantee of future results. Indexes are unmanaged, statistical composites and it is not possible to invest directly in an index.

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Combining Models: Developed Markets

Portfolio Weights As Of August 31, 2013

Minimum Variance

Managed Volatility Strategy

Base Model

Legend:
- USA
- Japan
- New Zealand
- Israel
- Hong Kong
- Ireland
- Portugal
- Sweden

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Combining Models: Emerging Markets

Portfolio Weights As Of August 31, 2013
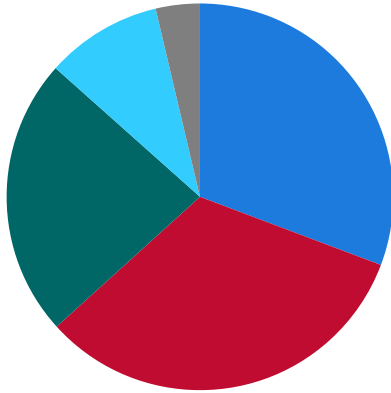
Minimum Variance
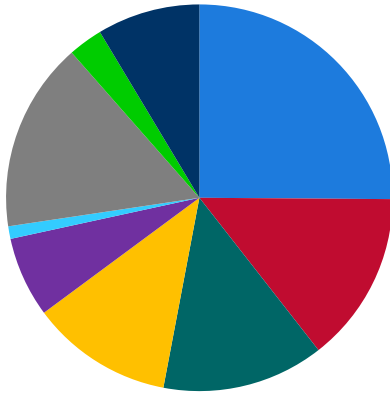
Base Model
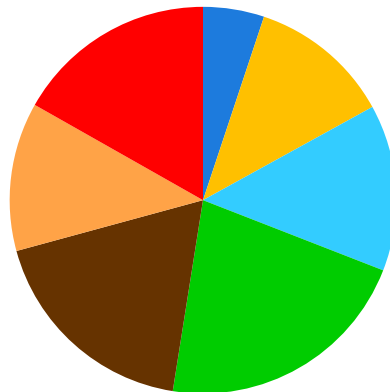
Managed Volatility Strategy
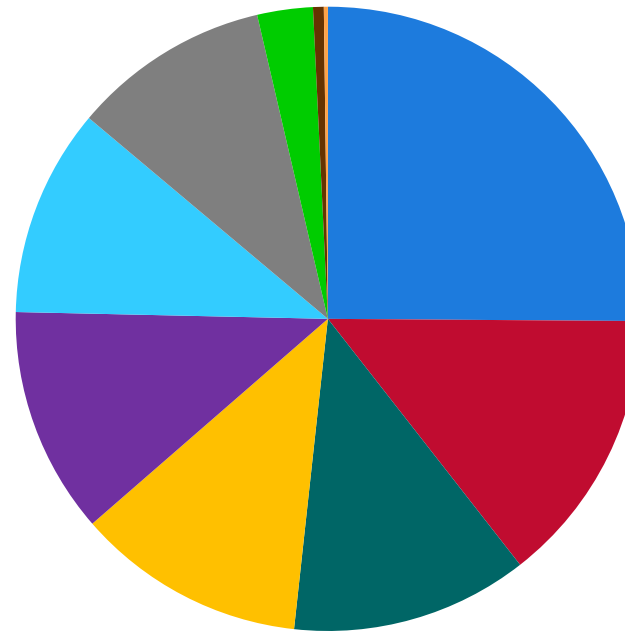
Legend:
- Taiwan
- Malaysia
- Thailand
- China
- Philippines
- Indonesia
- India
- Brazil
- South Africa
- Turkey
- Russia
- Chile

Source: S&P Capital IQ information as of August 31, 2013.

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Summary

- **Point-in-time fundamental data can be aggregated to assist in providing a more accurate and timely view of e.g. the growth, profitability and valuation characteristic of a country's stock market**

  - Appears to be better indicators of future performance than pure macroeconomic signals

- **Sovereign CDS is a promising signal**

- **Emerging and developed markets appear to have some commonality in how they react to certain signals, e.g. ROA and exchange rate movements but react very differently to other signals, e.g. dividend yield**

- **Signal simplicity is important when comparing between countries, particularly emerging markets**

- **Country Allocation Models based on aggregate fundamental signals appear to be able to enhance returns in both developed and emerging markets**

- **Minimum variance and volatility management at the country allocation level also appears to enhance risk adjusted returns for both developed and emerging markets**

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Q&A

Ruben Falk
Sr. Director, Investment Management

Appendix

S&P Capital IQ Global Stock Selection Models

Building Blocks	Model Components	Stock Selection Models
S&P Capital IQ Point-In-Time Fundamentals	Value	Developed Europe
S&P Capital IQ Estimates	Growth	Developed Asia Ex-Japan
Alpha Factor Library (450+ Global Factors)	Sentiment	Canada
	Quality	Emerging Markets
	Momentum	

Source: S&P Capital IQ.
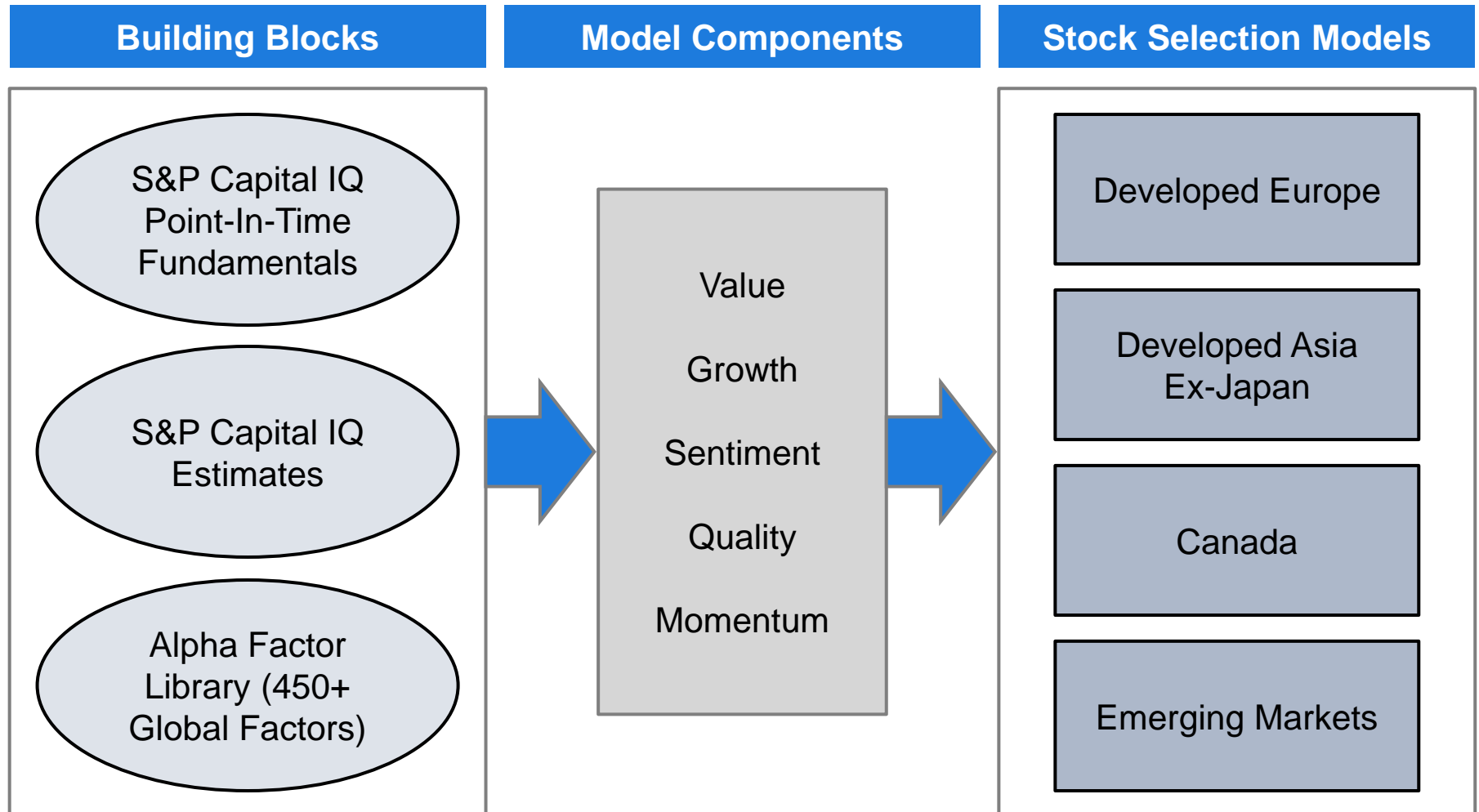
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Stock Selection And Allocation Model Performance

**Developed Markets (ex U.S. and Japan)
Stock Selection Model Performance**

— Benchmark — Stock Selection Model
(Benchmark Country Weights)
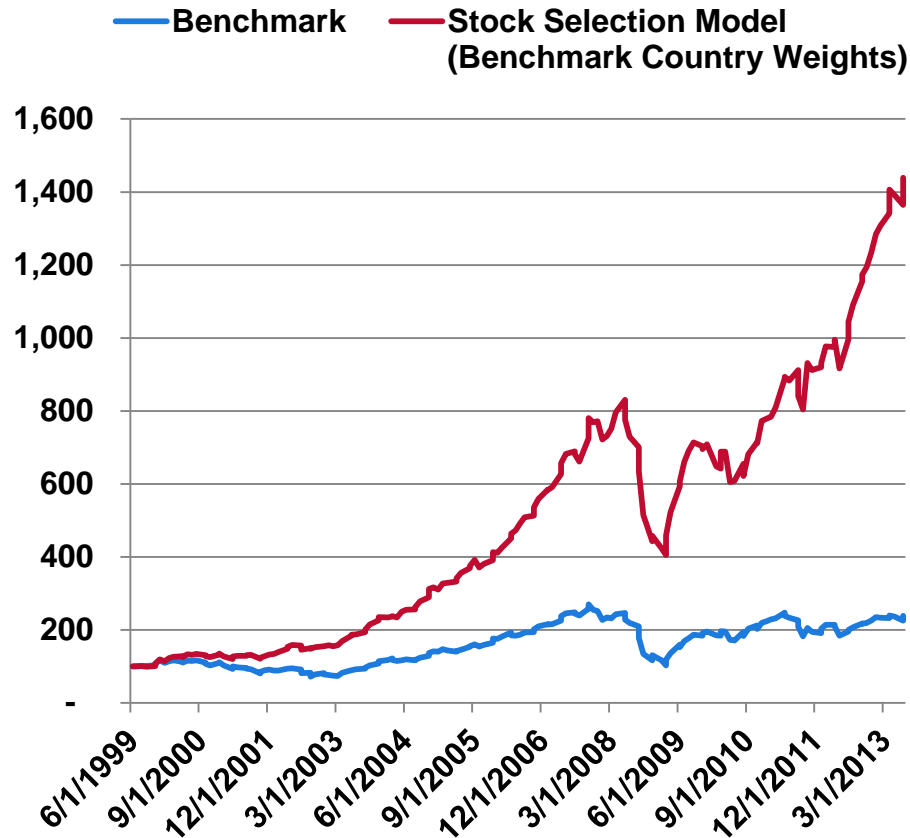
6/1/1999 – 8/31/2013	Ann. Return	Ann. Risk
Benchmark	6.3%	19.7%
Stock Model, Country Benchmark Weights	20.7%	16.0%
Stock & Country Allocation Models, Benchmark Weights +/-10%	20.7%	16.8%
Stock Model, Minimum Variance, Benchmark Weights +/-10%	22.9%	12.6%
Stock & Country Allocation Models, 12.5% Volatility Constraint, Benchmark Weights +/-10%	23.4%	13.3%

Note: USD based returns.

Source: S&P Capital IQ, ClariFI information as of August 31, 2013. Indexes are unmanaged, statistical composites and it is not possible to invest directly in an index.

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Earnings Quality
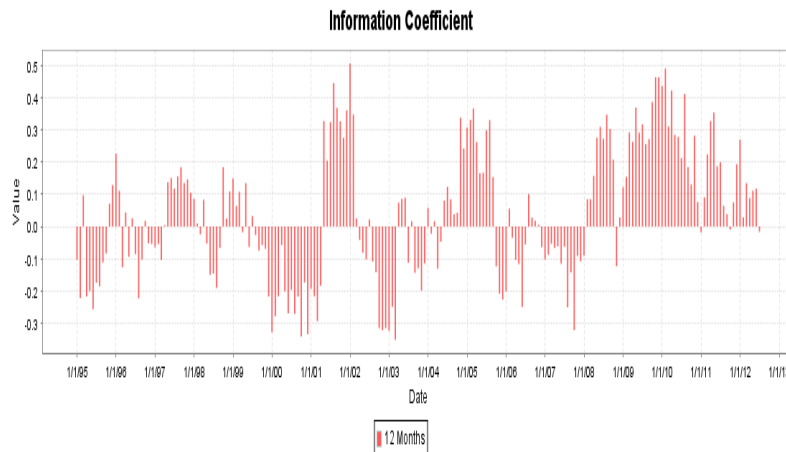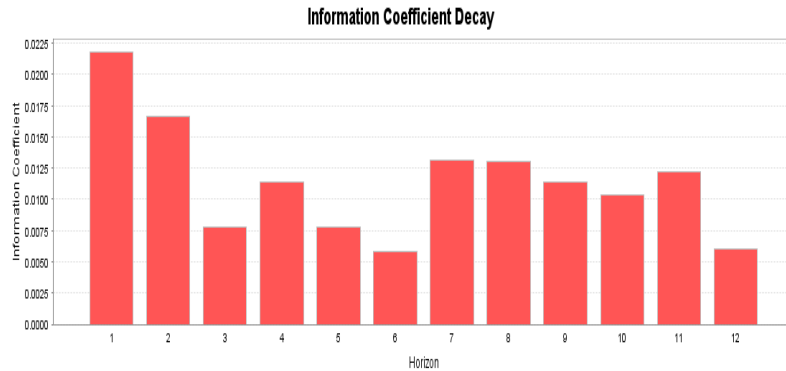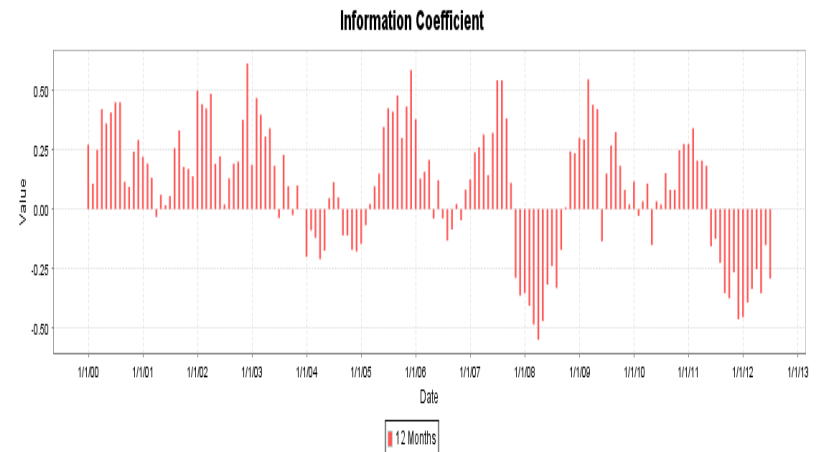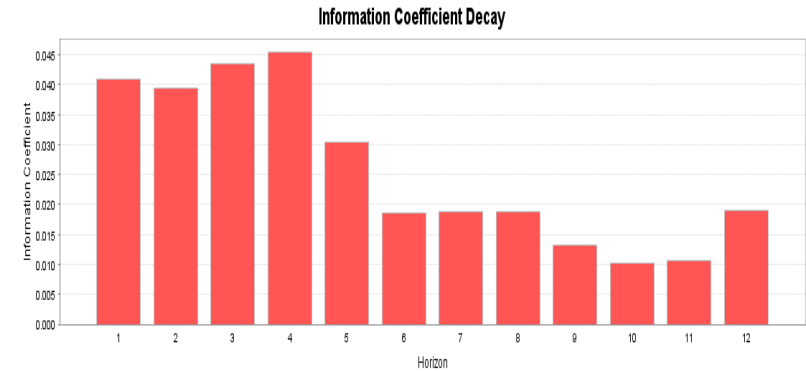
Source: S&P Capital IQ, ClariFI information as of June 30, 2013.
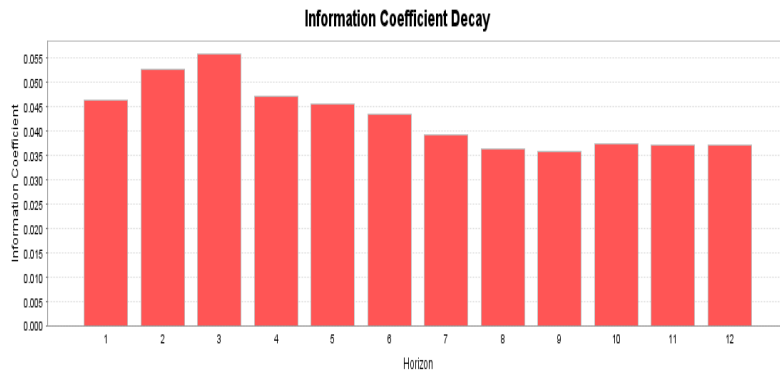
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Momentum
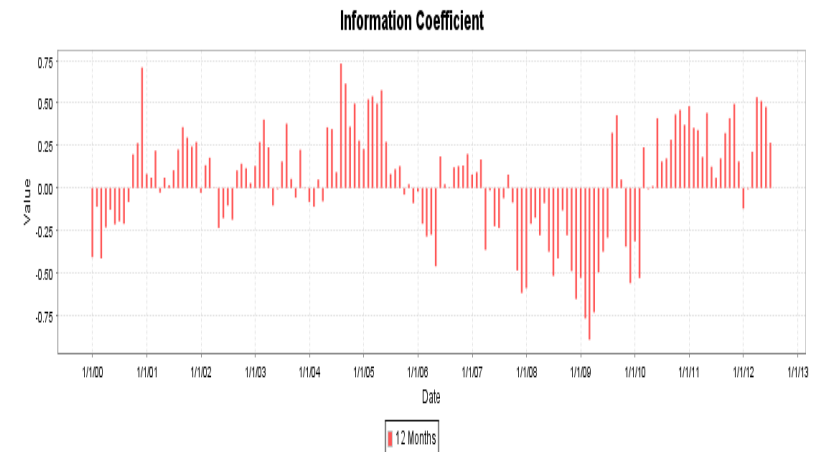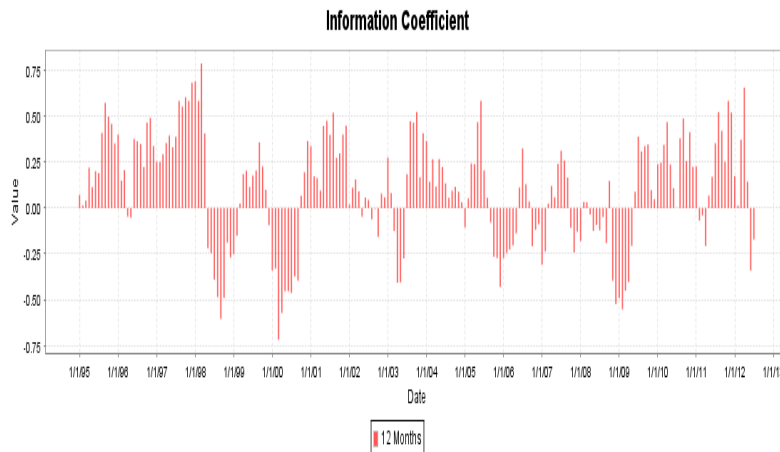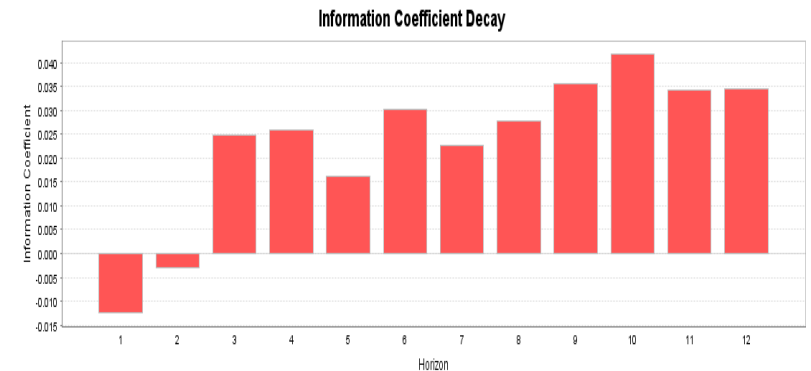
Source: S&P Capital IQ, ClariFI information as of June 30, 2013.

Reference Addendum

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