

Exploring Developed & Emerging Market Country Allocation & Stock Selection Models

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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
 - Minimum variance indices
- **Portfolio construction techniques**
 - Alpha model of derived signals
 - Managed volatility approach
- **Stock Selection Models**
 - Country allocation interaction

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 – Aug. 2013**
 Emerging/Global: Dec. 1999 – Aug. 2013
- **Transaction costs not explicitly considered**

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.

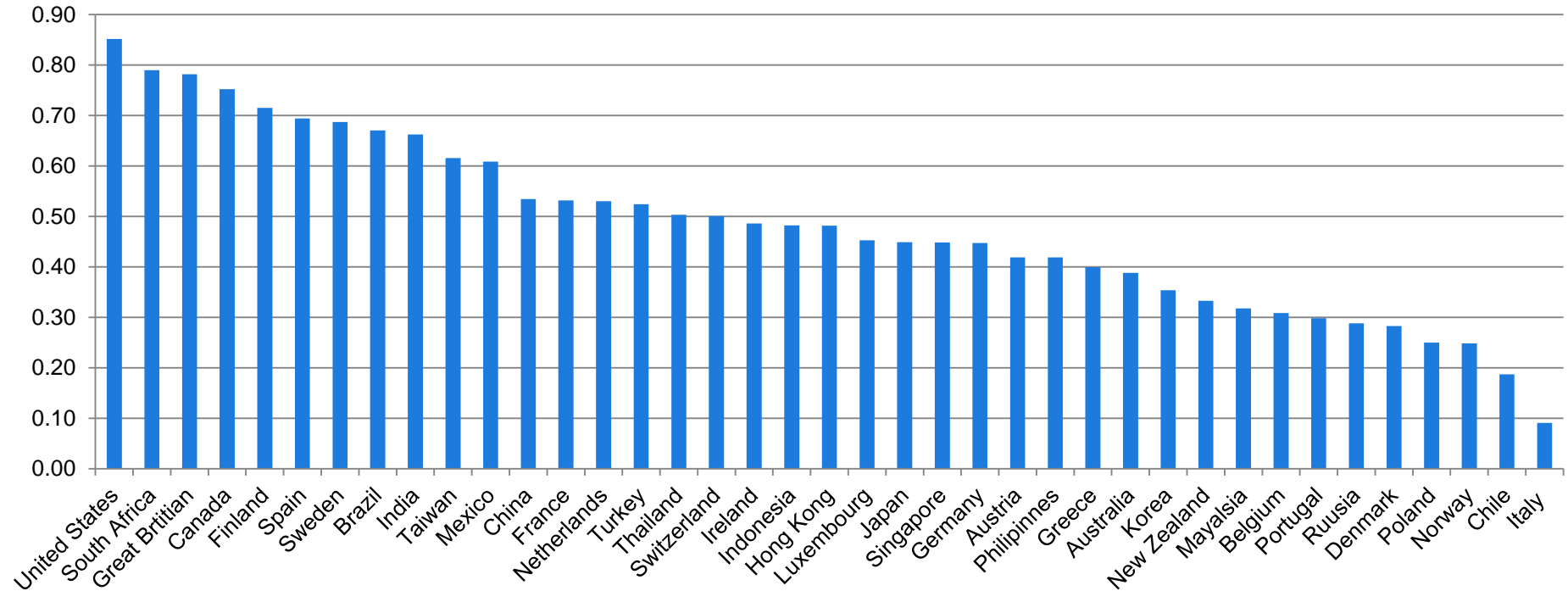
Countries Included In The Analysis (Latest)

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 the smaller emerging markets from the analysis due to lack of comprehensive historical fundamental data

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**

Source: S&P Capital IQ, PIT data and Global Insights Data information as of June 30, 2013.

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]	×

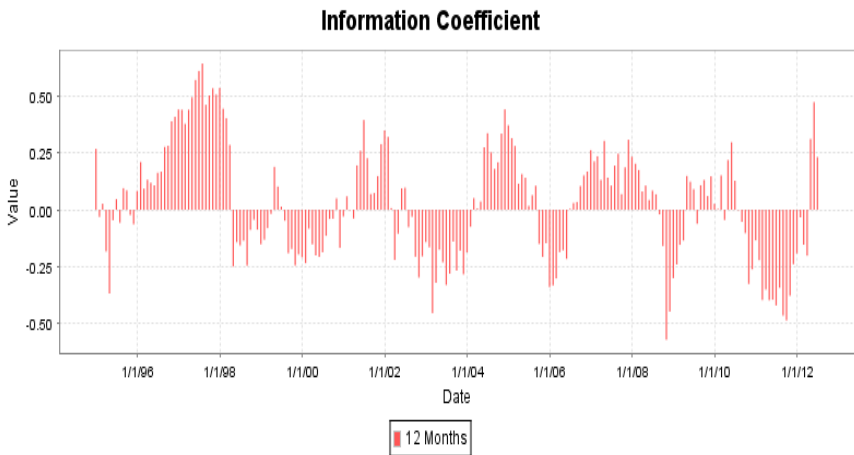
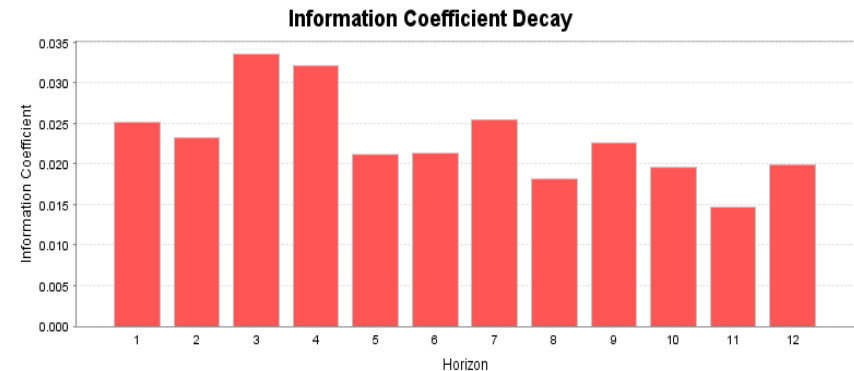
- **Several aggregate fundamental factors and some macro-economic indicators have statistically significant forecasting power with respect to country level returns**
 - However historical growth whether measured by Sales, Earnings or GDP did not produce statistically significant return forecasts

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

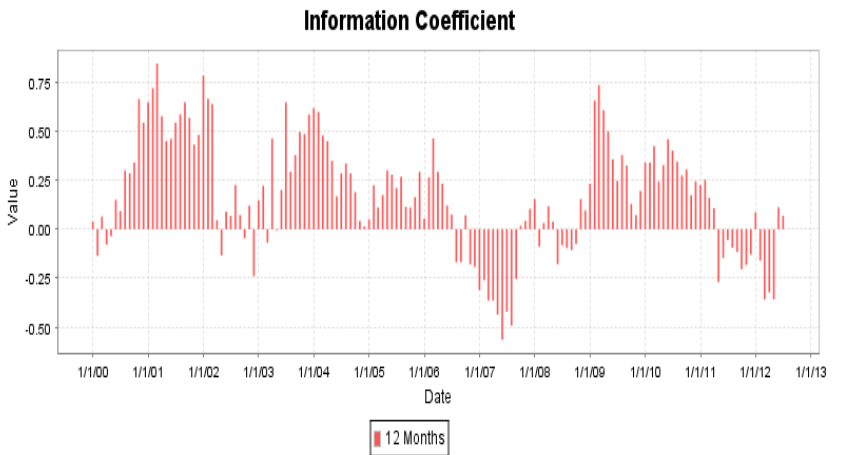
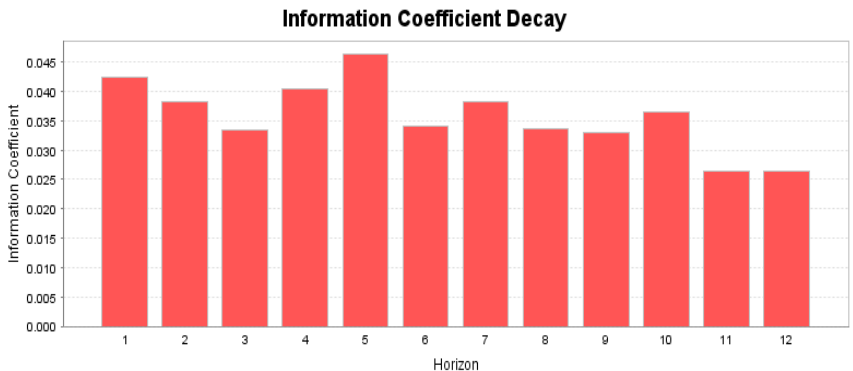
* = Significance of 66%, ** = Significance of 95%, ***Significance of 99%. [] = Forward month with the highest statistical significance.

Valuation Factors

Developed (FCF/Price)



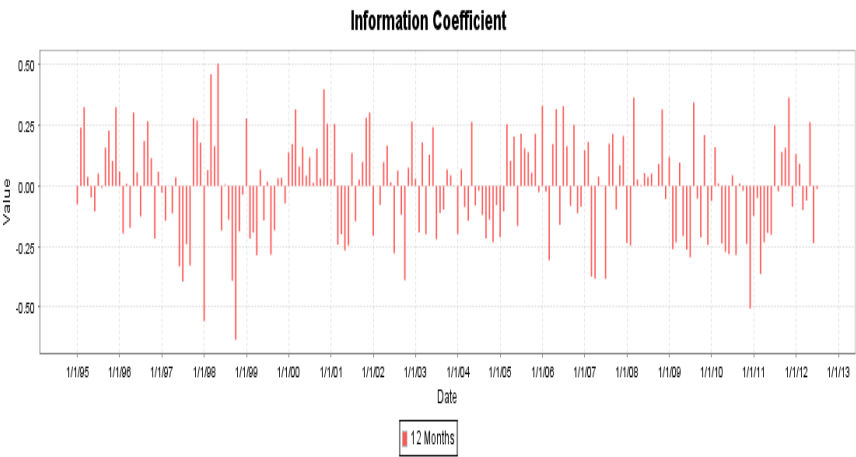
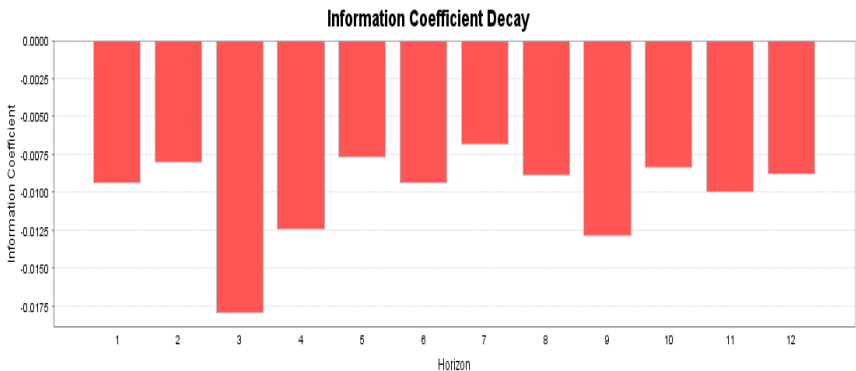
Emerging (EBITDA/EV)



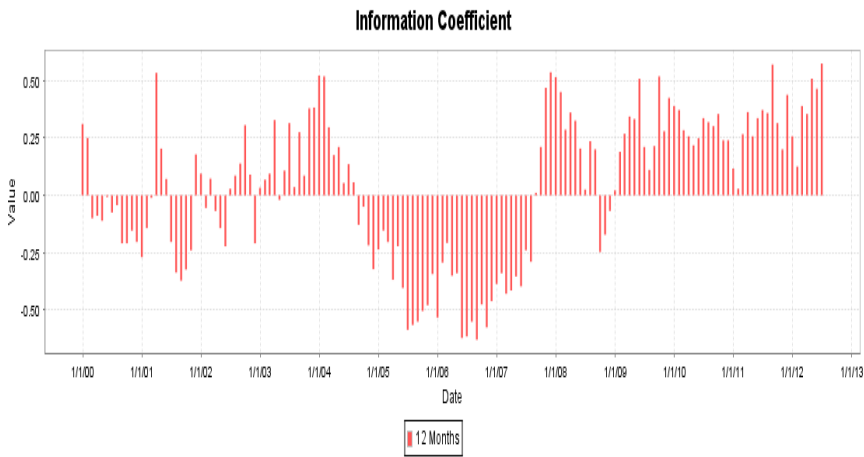
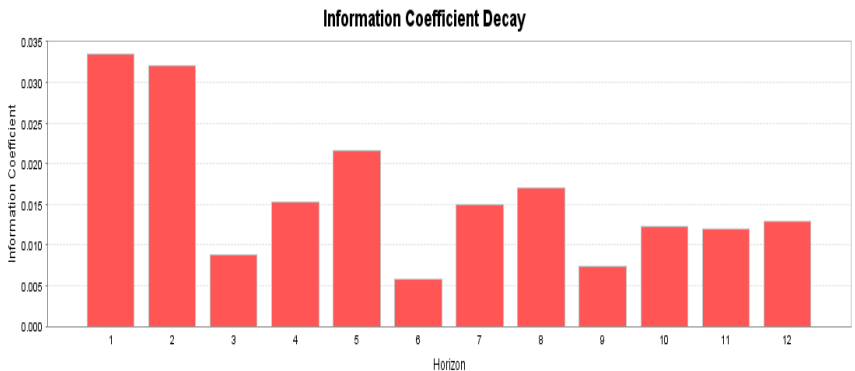
Source: S&P Capital IQ, Clarifi information as of June 30, 2013.

Dividend Yield

Developed



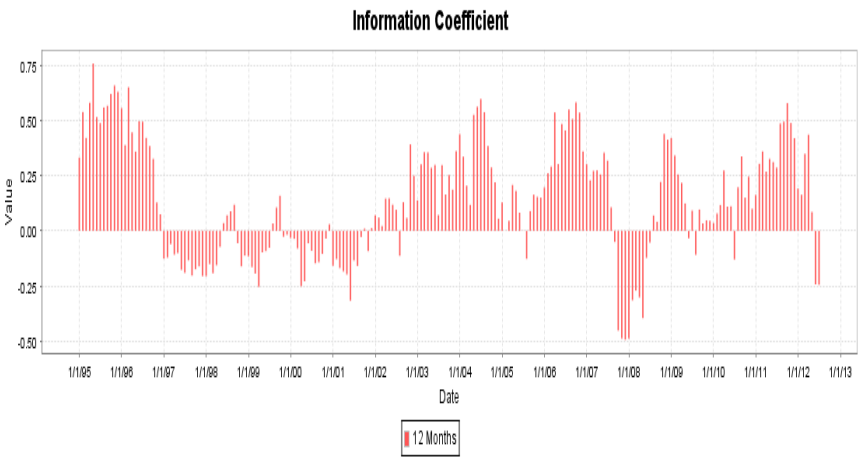
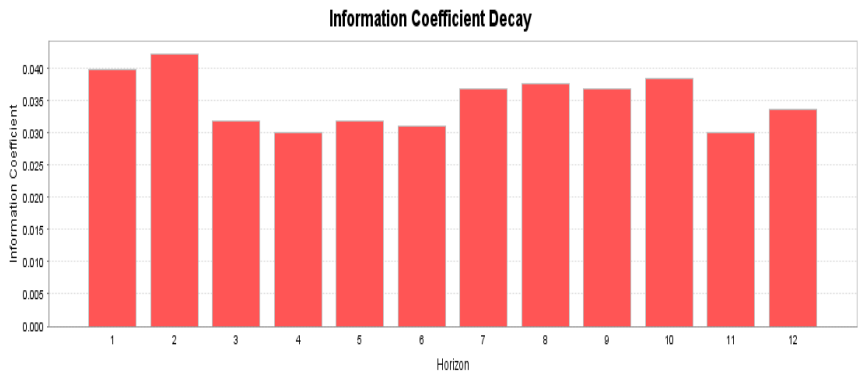
Emerging



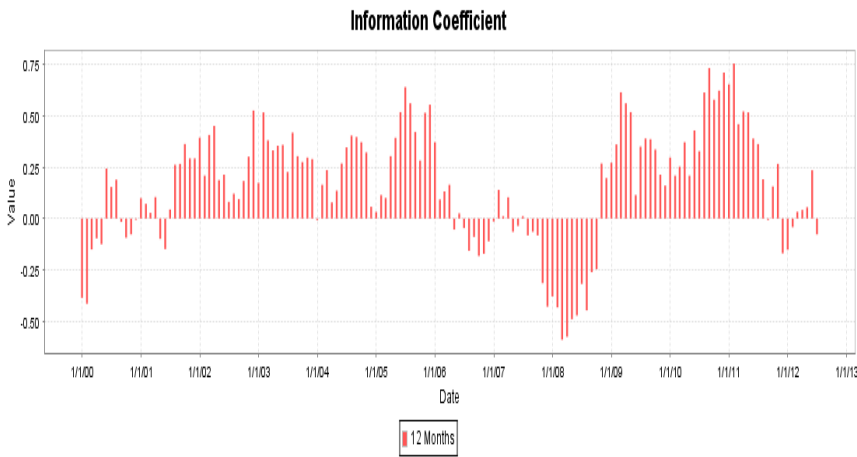
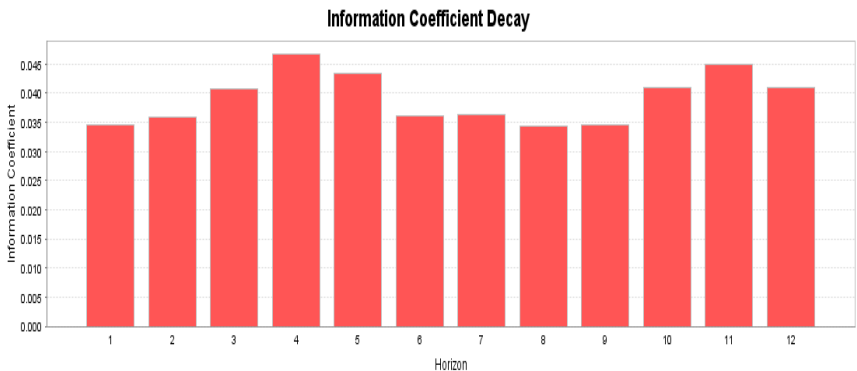
Source: S&P Capital IQ, ClariFI information as of June 30, 2013.

Capital Efficiency

Developed (Return on Assets)



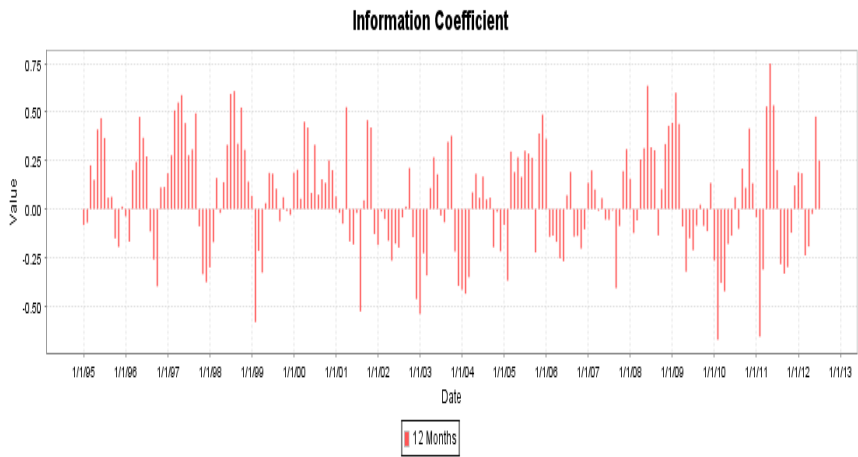
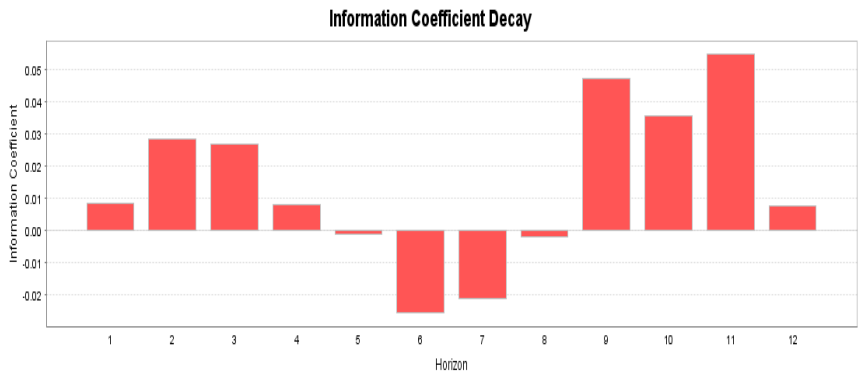
Emerging (Return on Assets)



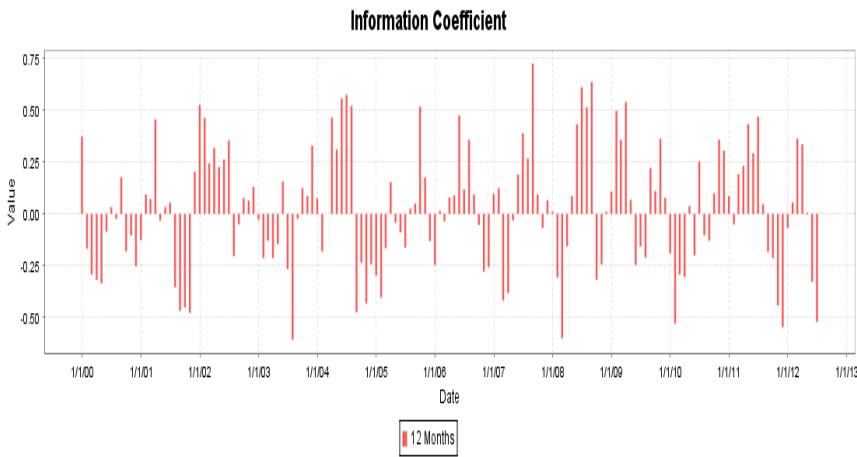
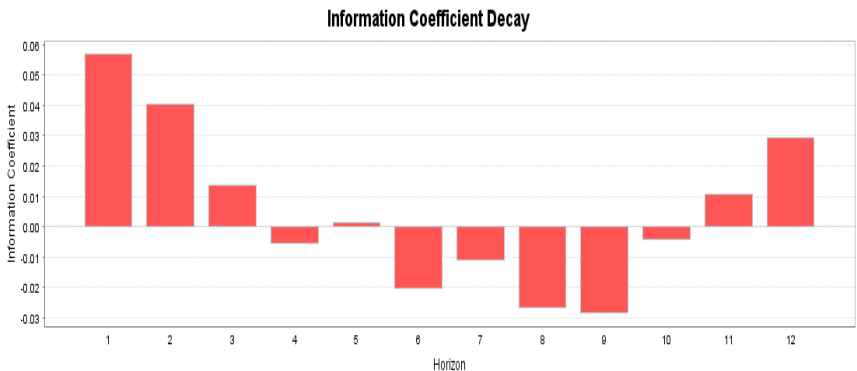
Source: S&P Capital IQ, ClariFI information as of June 30, 2013.

FX Rate (Three Months Change To USD)

Developed



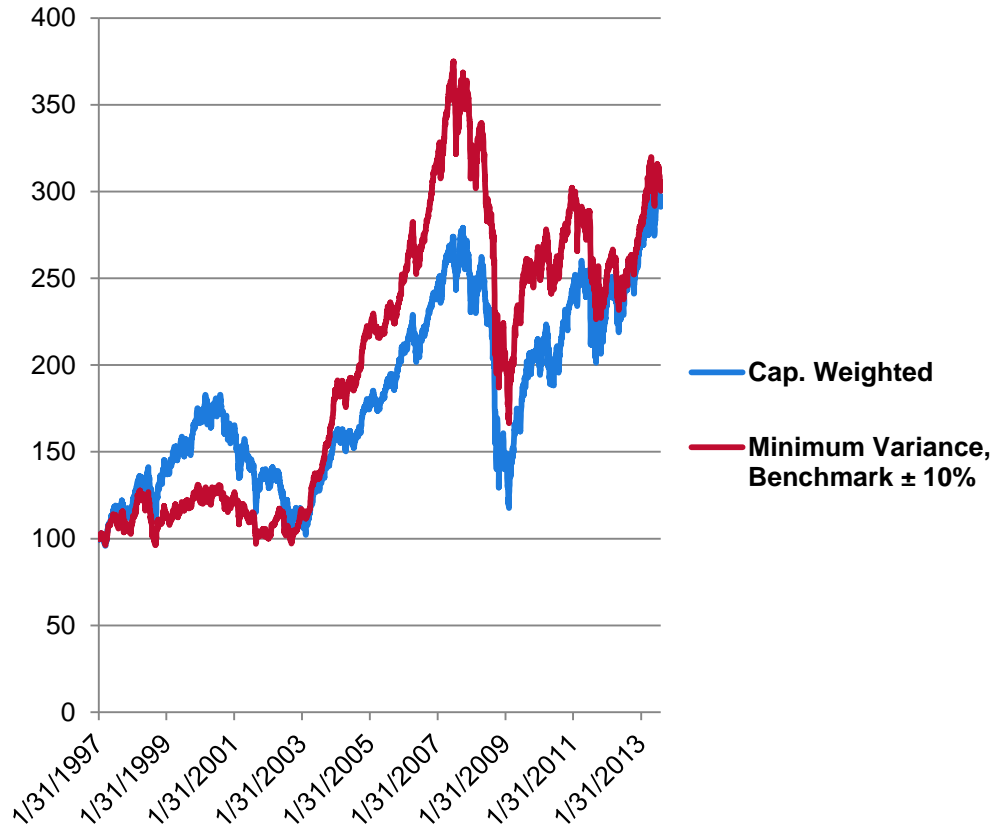
Emerging



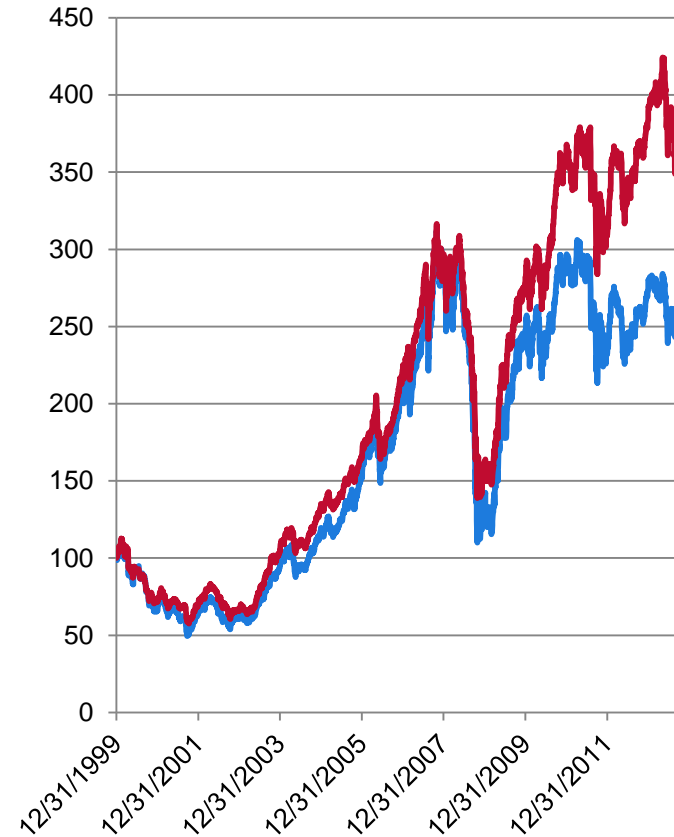
Source: S&P Capital IQ, ClariFI information as of June 30, 2013.

Establishing Benchmarks: Cap. Weighted And Minimum Variance

Developed



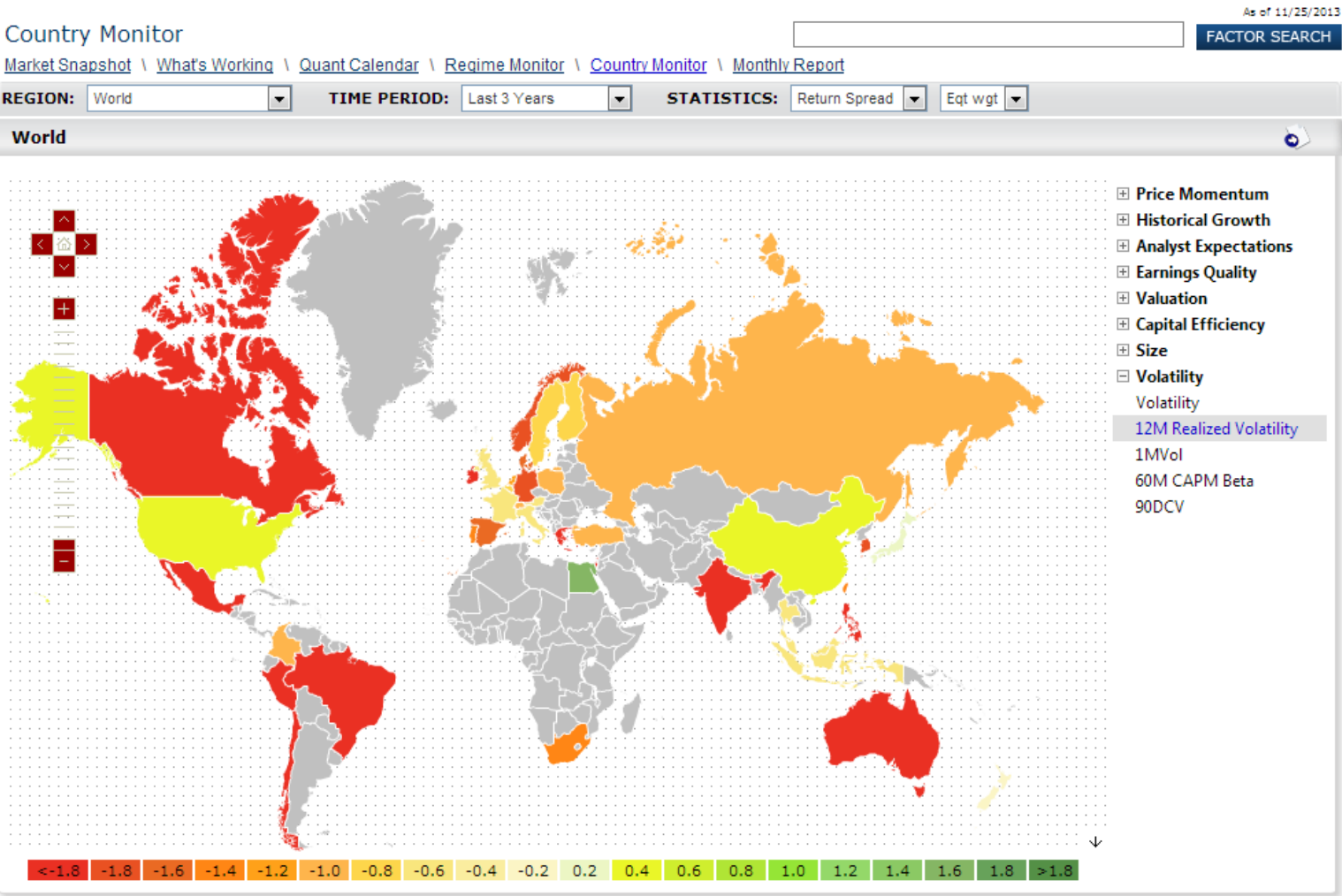
Emerging



Note: USD based returns.

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

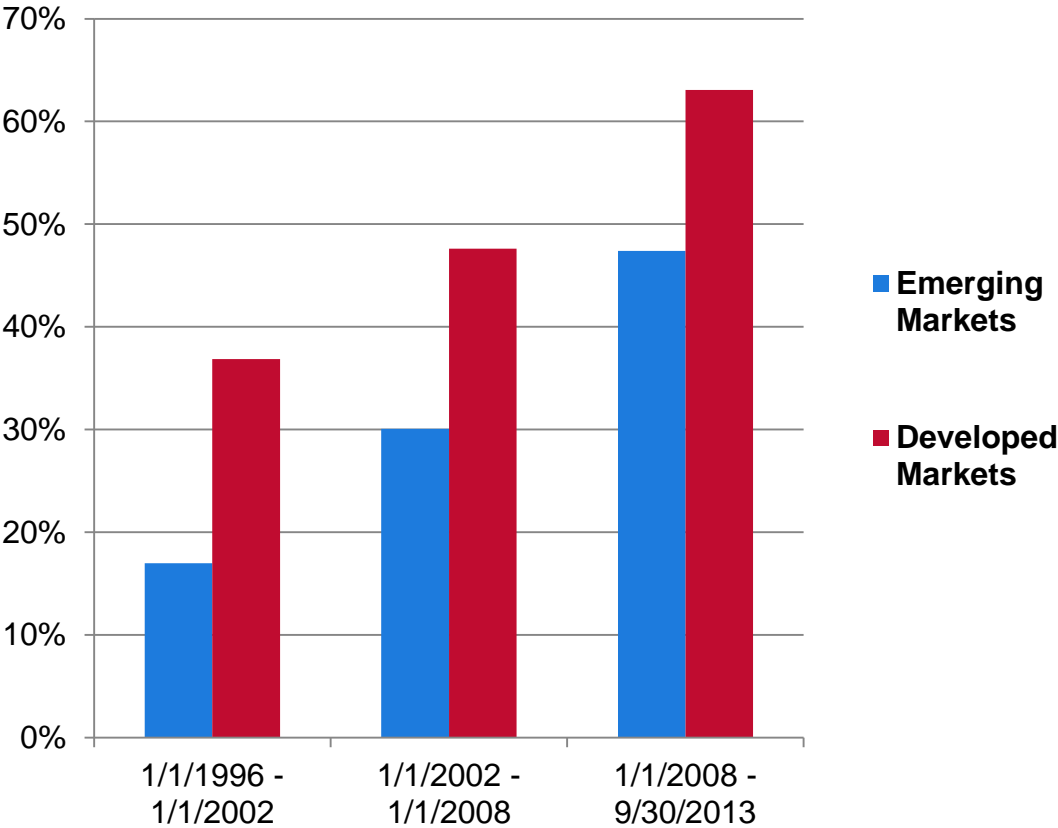
Recent Performance Of The Volatility Style In Alpha Factor Library



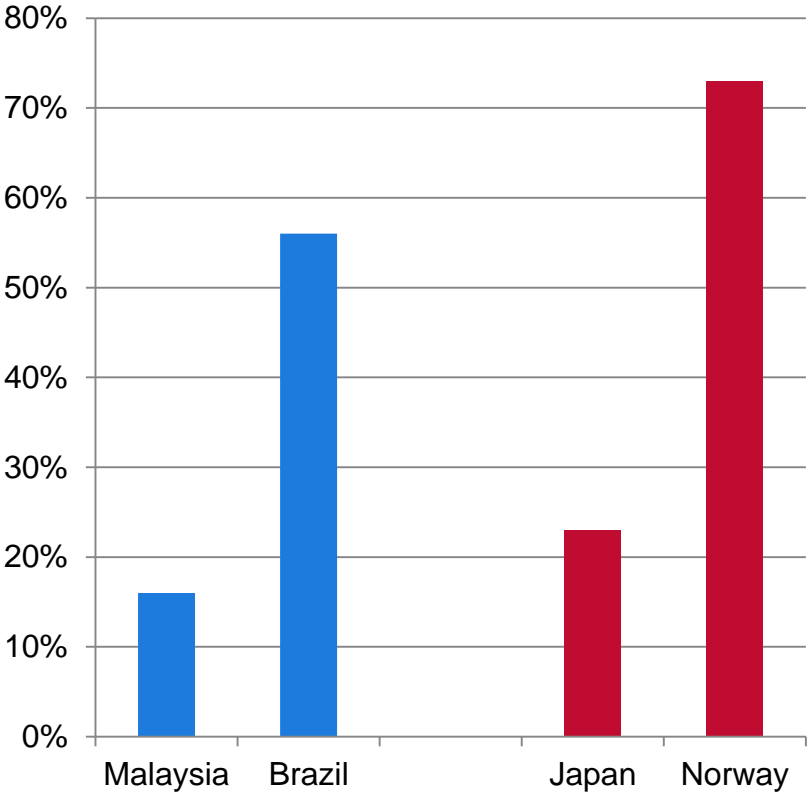
Source: Alpha Factor Library information as November 25, 2013.

Rising Correlations: Increasingly Important for Risk Management

Average Pairwise Country Return Correlation



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

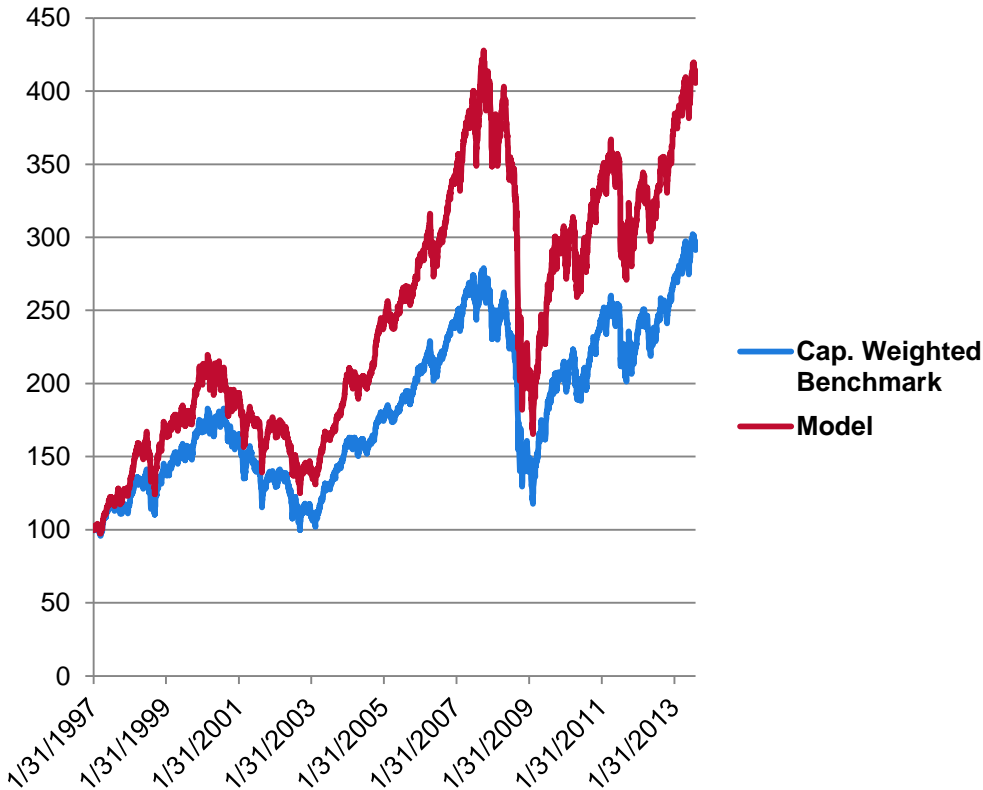
Building Equal Weighted Models For Developed And Emerging Markets

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

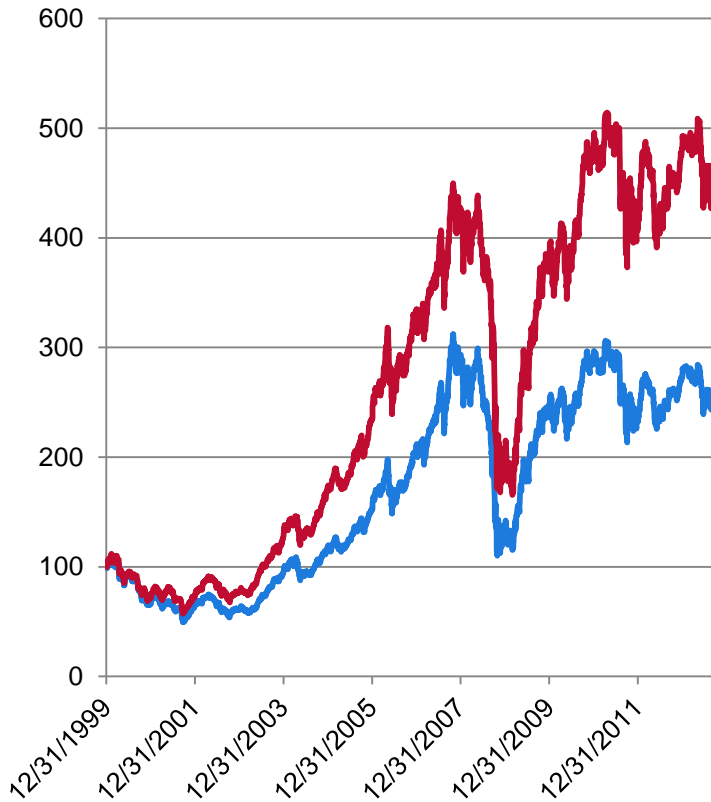
- **Portfolio Construction Objective:** Build Cap. Weighted Benchmark Relative Portfolios which maximizes the equal weighted sum of the country rankings for each factor in the respective model
- **Constraints**
 - Country weight: Benchmark Weight \pm 10%
 - Annual turnover: Max. 120% (one-way)

Model Performance Relative To Cap. Weighted Benchmarks

Developed



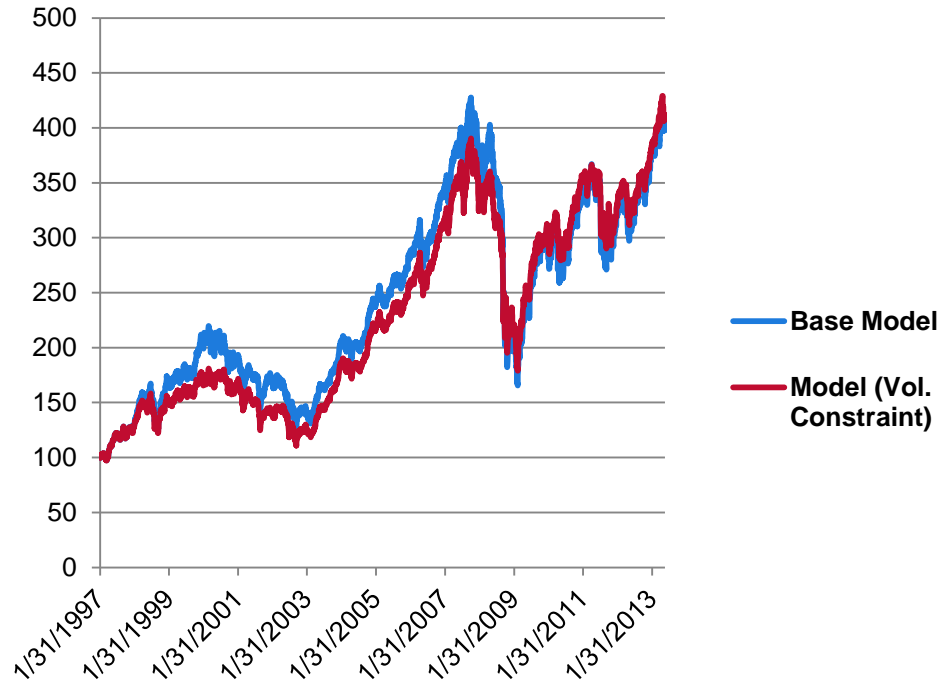
Emerging



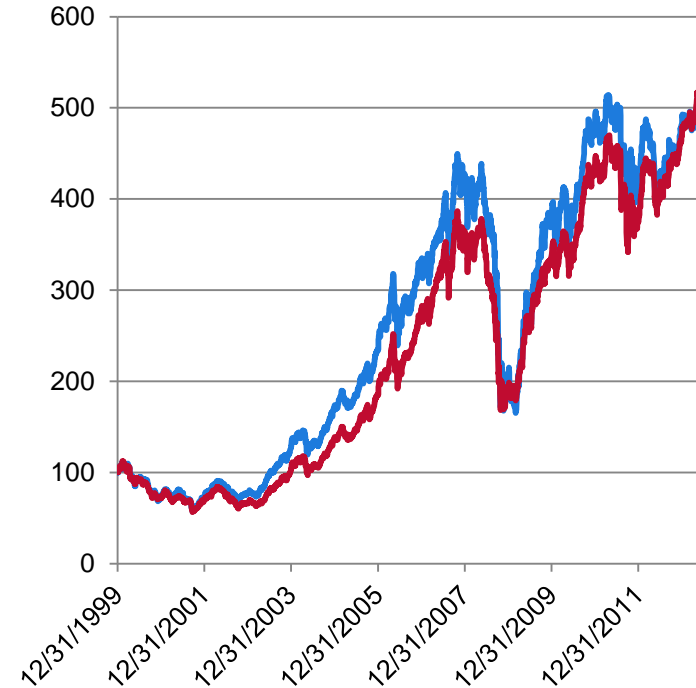
Note: USD based returns.
Source: S&P Capital IQ, ClariFI information as of August 31, 2013.

Effect Of Adding Volatility Management

Developed



Emerging



- **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 August 31, 2013.

Performance Summary

	Compound Ann. Return	Ann. Risk	Compound Return/Risk Ratio	Ann. Tracking Error	Ann. One-Way T/O
Developed (Dec. 1994 – Aug. 2013)					
Cap. Weighted Benchmark	6.6%	16.7%	0.40	0	0
Minimum Variance	6.9%	13.6%	0.50	11.7%	100%
Base Model	8.8%	17.6%	0.50	4.8%	105%
Managed Vol. Strategy (12.5% Vol. Constraint)	8.9%	14.3%	0.62	5.2%	88%
Emerging (Dec. 1999 – Aug. 2013)					
Cap. Weighted Benchmark	6.9%	19.8%	0.35	0	0
Minimum Variance	9.8%	15.7%	0.63	7.9%	66%
Base Model	11.3%	20.2%	0.56	6.5%	107%
Managed Vol. Strategy (15% Vol. Constraint)	11.3%	16.6%	0.68	7.5%	99%

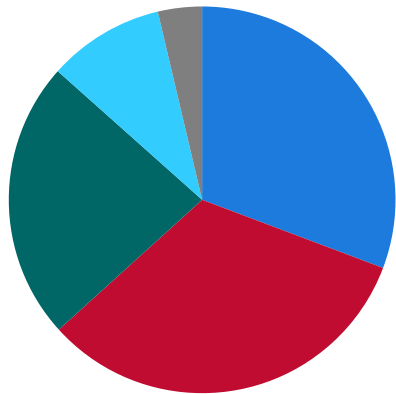
Note: USD based returns.

Source: S&P Capital IQ, ClariFI information as of August 31, 2013. Past Performance is no guarantee of future results.

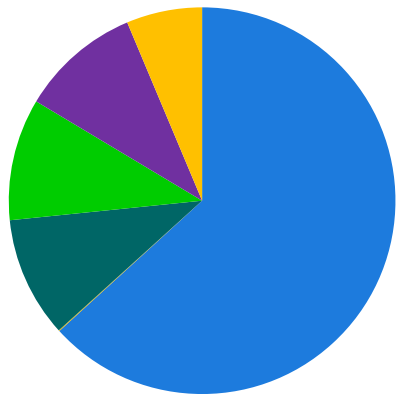
Combining Models: Developed Markets

Portfolio Weights As Of August 31, 2013

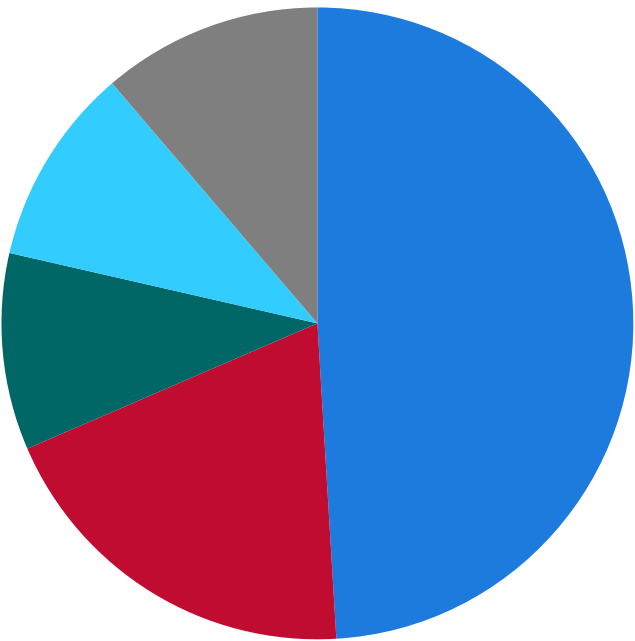
Minimum Variance



Base Model



Managed Volatility Strategy



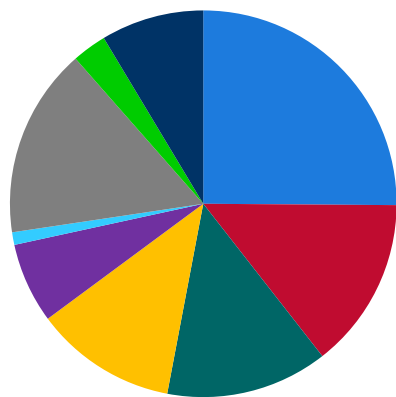
- USA
- Japan
- New Zealand
- Israel
- Hong Kong
- Ireland
- Portugal
- Sweden

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

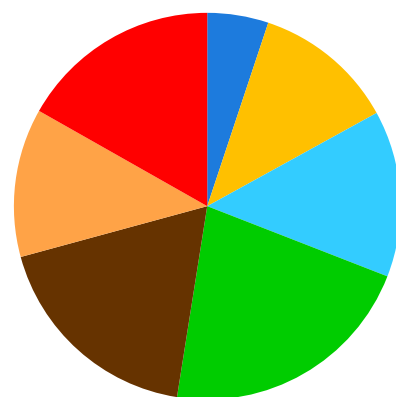
Combining Models: Emerging Markets

Portfolio Weights As Of August 31, 2013

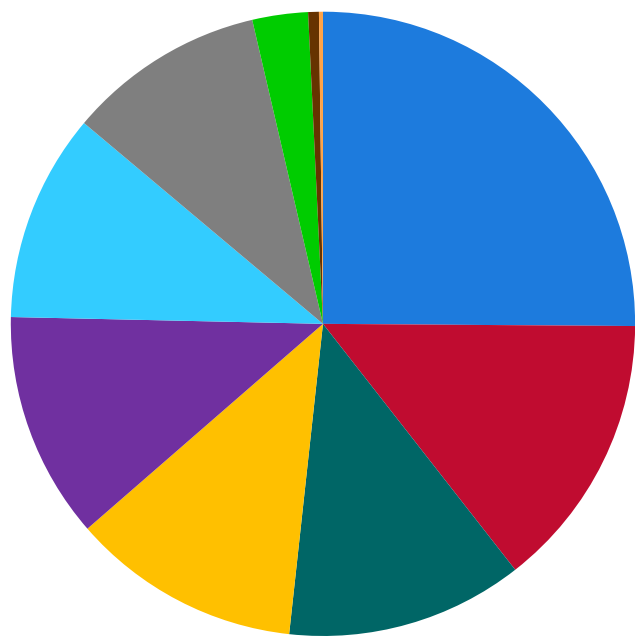
Minimum Variance



Base Model



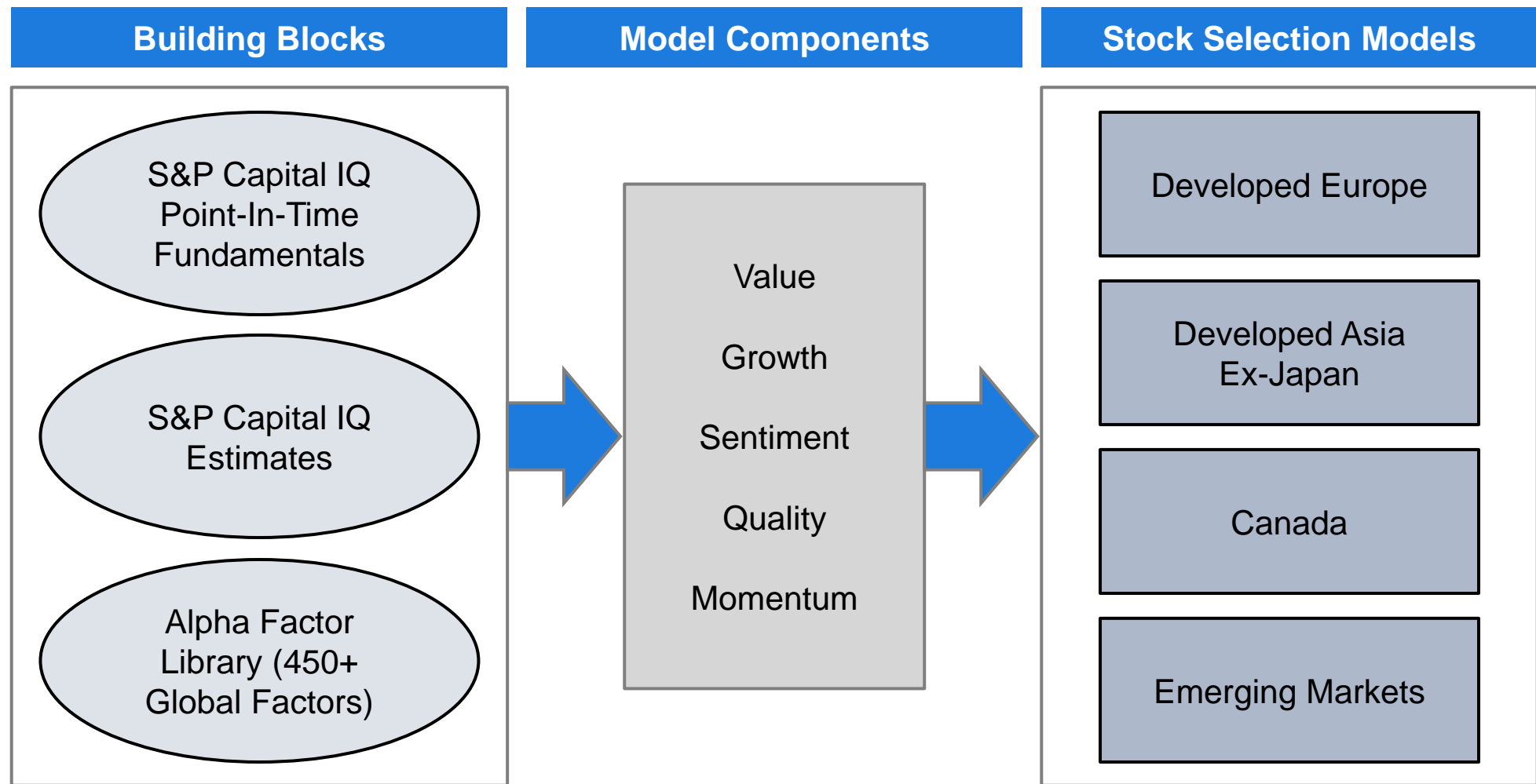
Managed Volatility Strategy



- Taiwan
- Malaysia
- Thailand
- China
- Philippines
- Indonesia
- India
- Brazil
- South Africa
- Turkey
- Russia
- Chile

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

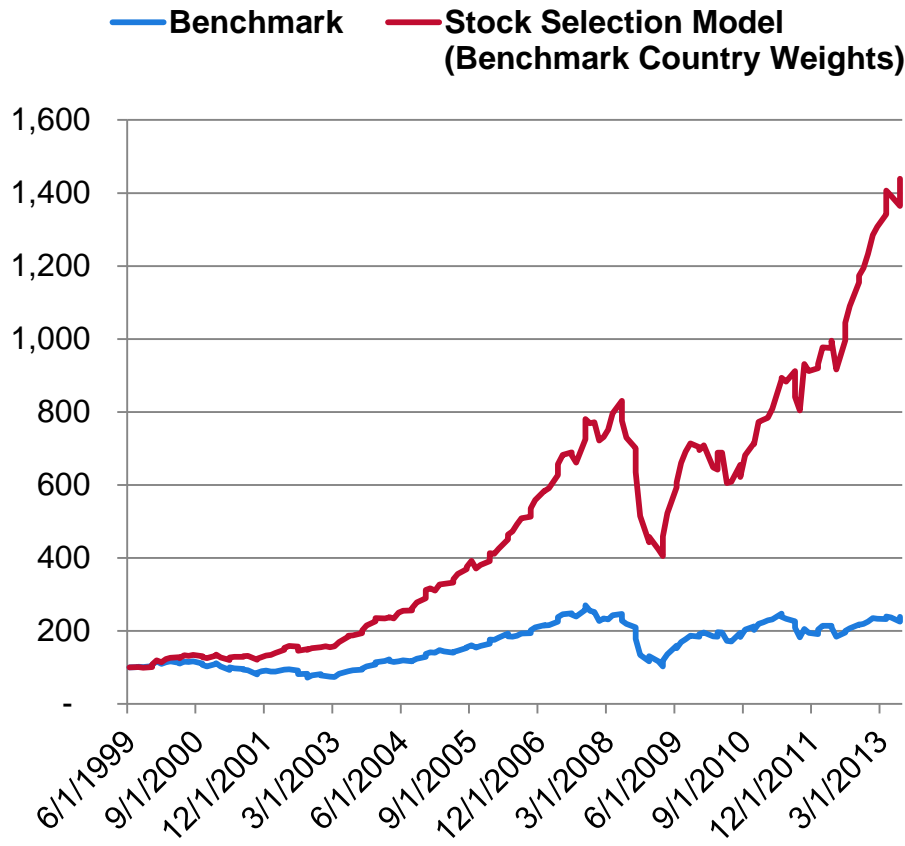
S&P Capital IQ Global Stock Selection Models



Source: S&P Capital IQ.

Stock Selection and Allocation Model Performance

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



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.

Summary

- **Point-in-time fundamental data can be aggregated to provide an 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
- **Emerging and developed markets appear to have some commonality in how they react to certain signals, e.g. ROA and exchange rate movements but, perhaps not surprisingly, react very differently to other signals, e.g. dividend yield**
- **Country Allocation Models based on aggregate (and to a lesser extent macroeconomic) signals appear to be able to enhance returns in developed markets and to be even more effective in emerging markets**
- **Combining Country Allocation and Stock Selection Models may not produce truly additive effects**
- **Volatility management at the country allocation level appears to enhance risk adjusted returns both for Country Allocation and Stock Selection Models**

Q&A

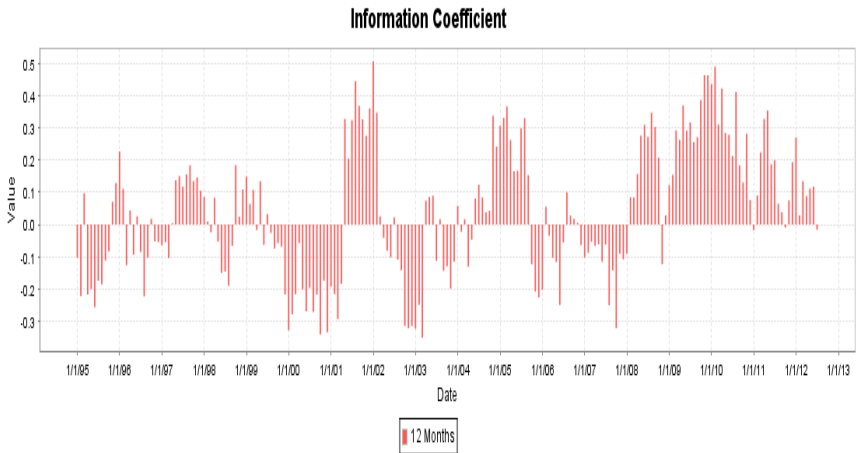
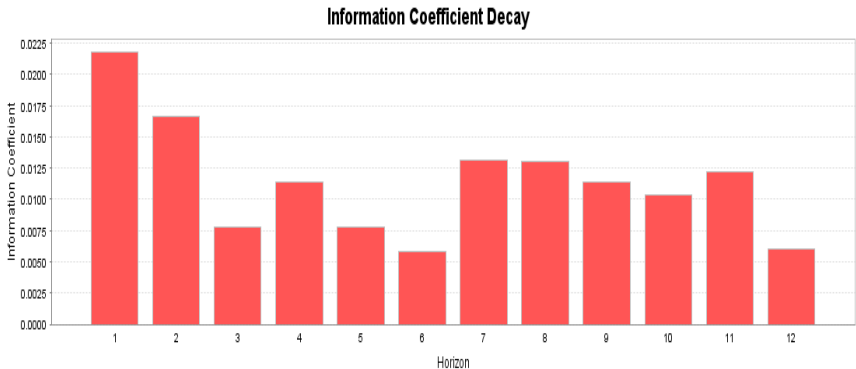


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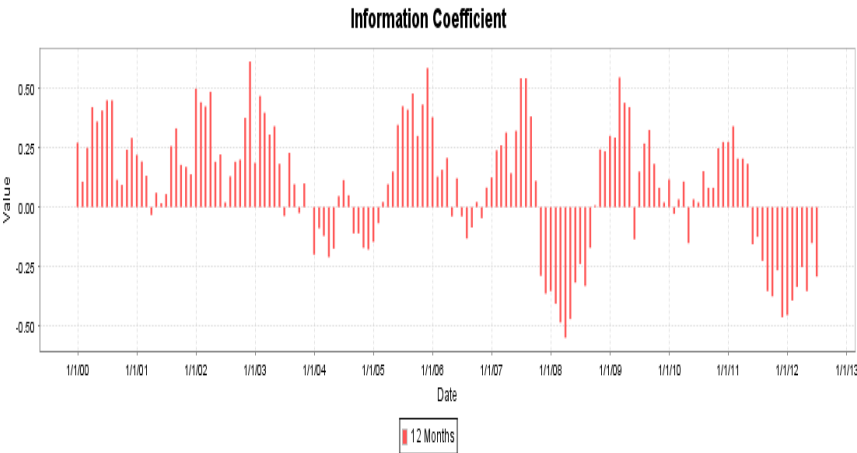
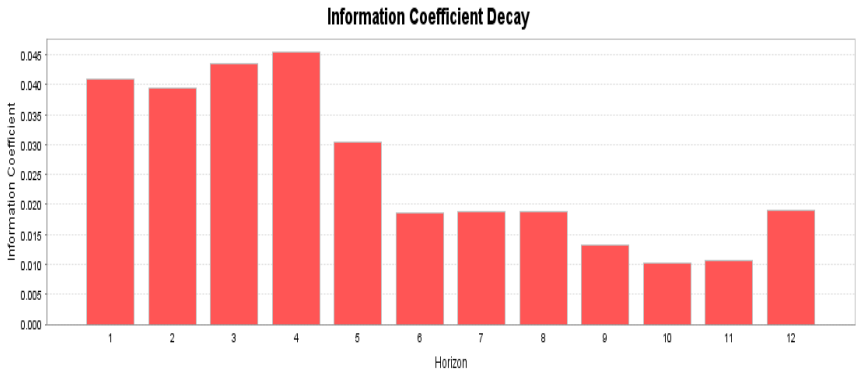
Appendix

Earnings Quality

Developed (Cash Flow Accruals)



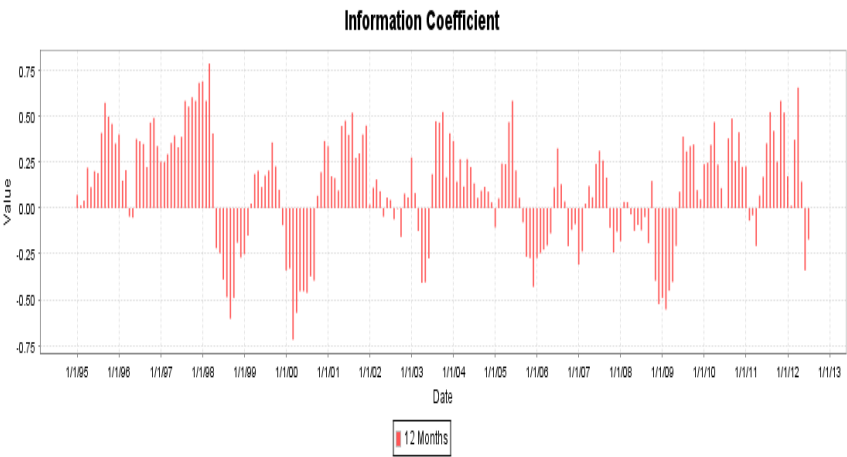
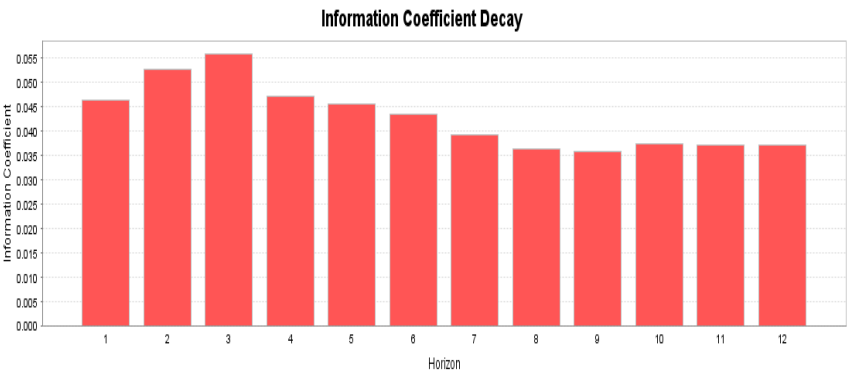
Emerging (Net Profit Margin)



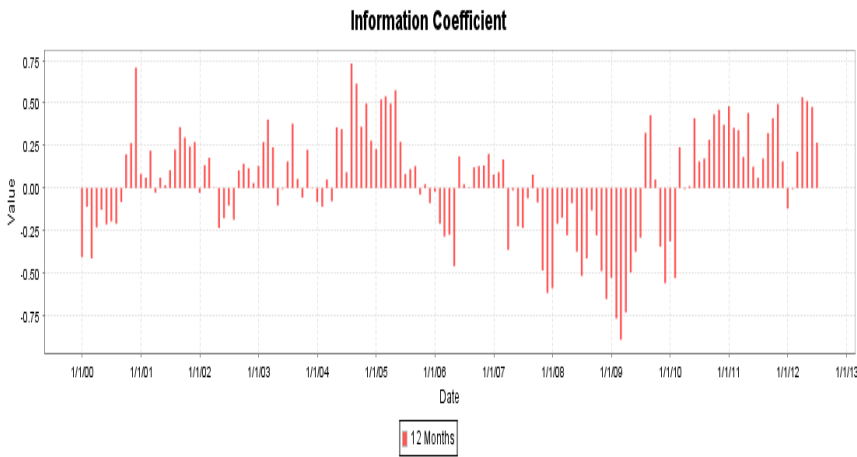
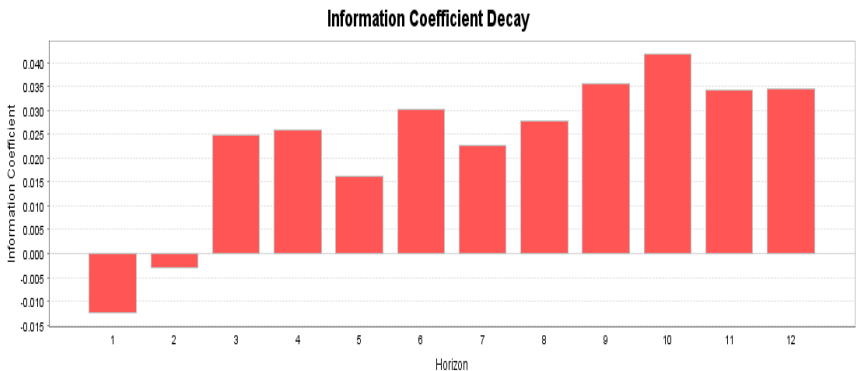
Source: S&P Capital IQ, ClariFI information as of June 30, 2013.

Momentum

Developed (Nine Months Price Momentum)



Emerging (Nine Months Price Momentum)



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

Reference Addendum

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Data Revisions are not Well-Behaved
University of Maryland, Department of Economics



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