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Releasing S&P Capital IQ's Regional and Updated Global & US Equity Risk Models

Over the course of the last two years we released our Global and US Fundamental Equity Risk Models. As a natural progression we are releasing the first set of Regional Models – the Pan-Asia ex. Japan and the Pan-Europe Fundamental Equity Risk Models. This document will explain some of the salient aspects of the process adopted for constructing the Regional Models. We have also made additional improvements to our US & Global Equity Risk Models, and we shall explain these changes.

Global equity risk models work well by providing a single risk model for a truly global investor interested in portfolio risk, forecasting and attribution. However for investors holding focused portfolios of equities limited to certain regions (e.g. only European stocks or Asian stocks) we offer the choice of using tailored regional models. The regional models offer a distinct advantage viz. more relevant factor construction which in turn leads to more intuitive and interpretable portfolio attribution.

The highlight of our risk models continues to be our building blocks - "best of breed" point-in-time Capital IQ data, state of the art Alpha Factor Library, Global Industry Classification System (GICS®) and an open and robust risk estimation methodology. As with our other models, we are releasing the regional models in a short and medium term version.

This paper builds on the global equity model process that is documented in greater detail in our whitepapers "Introducing Capital IQ's Global Fundamental Equity Risk Models", Balachander et al (2011) and "Introducing Capital IQ's Fundamental US Equity Risk Models", Scherer et al (2010).

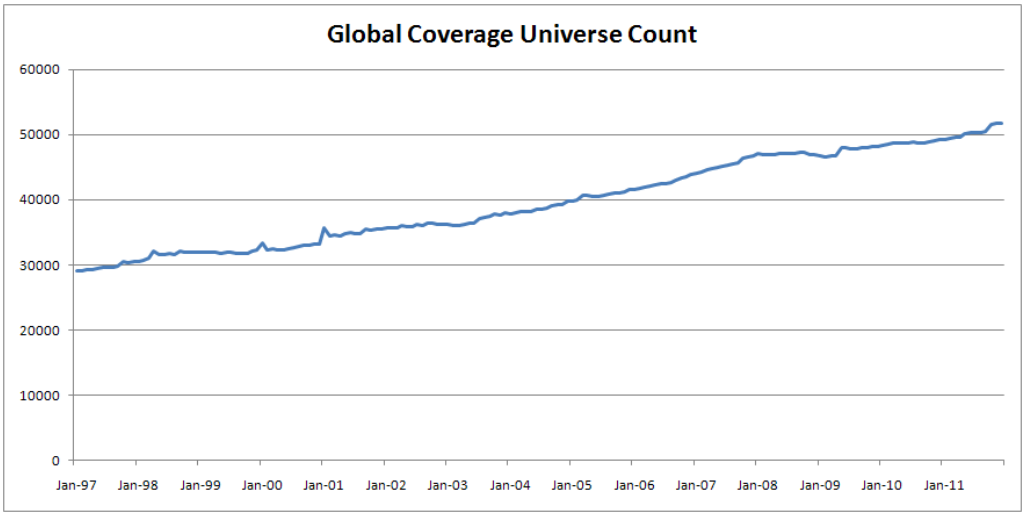
The paper proceeds as follows: In Section 1 we provide an overview of the changes to the global & US model construction methodology. Section 2 discusses methodology for building regional equity risk models. Section 3 explains the testing performed for regional models. In Section 4 we explain the suitability and relevance of using regional models over a global model, and we conclude in Section 5.

1 Global & US Model Updates

We released our US and Global Fundamental Equity Risk Models in July 2010 and May 2011 respectively and have since made enhancements in the construction of these and other models mainly with a view to providing better stock coverage and improving the relevance of risk attribution results. The new models are due to be released in the first half of 2012. The changes are:

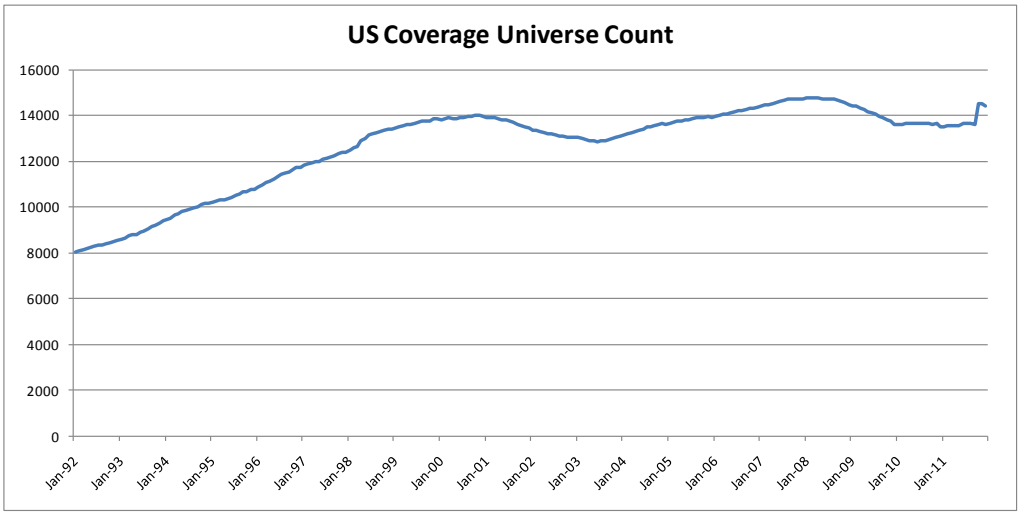
1. The coverage universe in the global model has dramatically increased from 25,000 in the previous version of the global model to about 50,000 global equities in the new version. See Figure 1 for the coverage count through time.
2. The coverage universe has also increased in the US model from 8,000 in the previous version to about 14,000 equities in the new version. See
3. Figure 2 for the coverage count through time.

Figure 1: Number of assets covered by Global Model



Source: S&P Capital IQ

Figure 2: Number of assets covered US Model



Source: S&P Capital IQ

4. Table 1 summarizes the coverage count for the updated Global model broken down by country.

Table 1: Global Model Coverage by Country as of Dec 2011

Country	Stocks	Country	Stocks	Country	Stocks
Albania	1	Greece	314	Pakistan	336
Argentina	99	Greenland	2	Panama	6
Australia	2105	Hong Kong	1328	Papua New Guinea	4
Austria	118	Hungary	59	Peru	140
Bahamas	7	Iceland	8	Philippines	269
Bahrain	42	India	2637	Poland	526
Bangladesh	254	Indonesia	444	Portugal	57
Barbados	2	Iran	50	Puerto Rico	1
Belgium	184	Ireland	141	Qatar	42
Belize	4	Israel	626	Romania	138
Bermuda	135	Italy	341	Russia	575
Botswana	20	Jamaica	24	Saudi Arabia	148
Brazil	593	Japan	3754	Senegal	1
Bulgaria	163	Jordan	227	Serbia	19
Cameroon	2	Kazakhstan	40	Singapore	741
Canada	5126	Kenya	45	Slovakia	26
Cayman Islands	51	Korea, Republic of	1991	Slovenia	55
Chile	214	Kuwait	209	South Africa	407
China	3222	Latvia	29	Spain	264
Colombia	60	Lebanon	19	Sri Lanka	257
Costa Rica	1	Liechtenstein	2	Sudan	1
Côte d'Ivoire	29	Lithuania	35	Sweden	541
Croatia	139	Luxembourg	109	Switzerland	375
Cyprus	108	Macedonia	2	Taiwan	1727
Czech Republic	25	Malaysia	963	Thailand	842
Denmark	217	Malta	15	Trinidad and Tobago	17
Dominican Republic	1	Marshall Islands	1	Tunisia	56
Ecuador	11	Mauritius	36	Turkey	366
Egypt	173	Mexico	182	Ukraine	125
Estonia	15	Monaco	4	United Arab Emirates	110
Faroe Islands	1	Morocco	77	United Kingdom	2504
Finland	154	Namibia	6	United States	11335
France	899	Netherlands	250	Uruguay	3
Gabon	1	Netherlands Antilles	8	Venezuela	31
Georgia	3	New Zealand	156	Viet Nam	673
Germany	1103	Nigeria	189	Virgin Islands, British	22
Ghana	18	Norway	257	Zambia	15
Gibraltar	3	Oman	90	Zimbabwe	70
				TOTAL	**52798**

Source: S&P Capital IQ

5. Previously the world and regional market factor returns for the global model were computed by log-capitalization weighting the constituent local market returns. In the new model we have modified the weighting scheme to be the raw market capitalization. This approach slightly favors larger capitalization names and tends to yield more intuitive attribution results with respect to world and regional exposures of standard float weighted benchmarks. The accuracy of risk estimates is generally unaffected.

6. For all models, we now impute any missing stock returns by filling in with mean returns of stocks within the same sub-industry (GICS level 4). We have altered the specific risk computation for stocks with imputation by introducing an empirical variance inflation factor.

$$AdjustedStockSpecificRisk = StockSpecificRisk * \sqrt{\frac{NumHistoryMonths}{NumNonImputedMonths}}$$

where *NumHistoryMonths* = 24 since we use 2 years of daily data and *NumNonImputedMonths* is the number of months we have not filled in with sub-industry returns. This approach yields a higher (more conservative) specific risk estimate for stocks for which we don't have a full return history (e.g. IPOs). If a stock is missing a GICS classification then we use the grand mean across all sub-industries.

7. We also perform a post-processing of the estimated exposures to make sure they are within reasonable bounds. This is important for illiquid stocks that may not have reliable returns data and could give rise to inaccurate estimates. Thus, if the estimated market beta or the specific risk is outside of certain bounds then we replace the entire returns for those stocks by the corresponding sub-industry returns and re-run the exposure estimation. The filter can be specified as

   MktBeta > *mean* +*K1* * *sigma* OR *MktBeta* < *mean* - *K2* * *sigma* OR *specificRisk* > *mean* + *K3* * *sigma*,

   where *mean* and *sigma* refer to the mean and standard deviation of the corresponding measures across all the stocks in the coverage universe. Table 2 shows the values of empirical constants K1, K2 and K3 for the different models.

Table 2: Empirical Bounds K1, K2 and K3 used in replacing stock returns by sub-Industry returns (see above for explanation)

Risk Model	K1	K2	K3
US	4	1	1
Global	5	1	2
Pan-Europe	4	2	1
Pan-Asia	3	1	2

Source: S&P Capital IQ

2 Building Regional Fundamental Time Series Risk Models

2.1 Methodology

The Pan-Asia ex. Japan and Pan-European time series models follow a similar approach to the global model construction. They are constructed from the factor series of (i) Market returns (ii) Currency returns (iii) Fundamental style factor returns calculated from our factor library and (iv) Regional GICS industry returns.

For market returns we use the countries represented in the S&P Global Broad Market Index (BMI). We have a total of 45 different local country market returns within the BMI. From these we additionally construct a regional European (Asian) market return for a total of 46 market factors. The regional markets were obtained by market capitalization weighting the constituent country markets. We also utilize 34 currency factors obtained from BMI implicit currency returns. Table 3 shows the constituent BMI countries for each of the Pan-Europe and Pan-Asian regions.

Table 3: Regional Constituents from BMI Countries

Region	Countries
Pan-Europe	Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, Denmark, Hungary, Norway, Poland, Sweden, Switzerland, Czech Republic, Russia, UK
Pan-Asia (excluding Japan)	China, India, Indonesia, Malaysia, Korea, Philippines, Singapore, Taiwan, Thailand, Hong Kong, New Zealand, Australia

Source: S&P Capital IQ

Let f_{Rgn} represent a time series of total returns of the regional market. Also let f_{FXi}, and f_{Mkti} represent the time series of returns of the corresponding quoted currency and local market respectively for the i[th] stock. Then a model of the stock equity returns r_i can be specified as in equation (1) below

(1) $$r_i = \beta_{FX_i} f_{FX_i} + \beta_{Rgn_i} f_{Rgn} + \beta_{Mkt_i} f_{Mkt_i} + \sum_{k=1}^{N_{Styles}+N_{Sectors}} \beta_k f_k$$

To get a parsimonious representation, for each stock we use just the corresponding local market and local currency. The final block in the model corresponds to style (of which there are 8 composite factors) and industry (24 global GICS sub-sectors) factors. The 8 composite style factors were constructed by equal weighting the factors within each style group (refer to the next subsection for more details on the style factors).

The data used for the purposes of this paper starts in 1995 and ends in 2011. Industry factor returns are calculated at GICS level 2. The model is estimated real time with no look-ahead bias. We use Ordinary Least Squares (OLS) for exposure estimation with 2 years of daily data and Exponentially Weighted Moving Average (EWMA) based covariance estimators along with a NEWEY/WEST correction for serial correlation in daily returns.

Since multiple local markets are involved with different daily market closing times, synchronization of market returns is very important. We fitted a Vector Auto Regressive (VAR) model that corrects daily returns of all markets based on markets that close later in the day. Essentially, we apply a correction to local returns to adjust for how later closing markets moved across the world. This involves estimating the returns if all the markets closed at the same time as the US market. Also, since we use daily currency returns for the currency model, which tend to be noisy, we use a Principal Component Analysis (PCA) based currency returns noise suppression method that models currency returns using a factor model. The factors are estimated from the return covariance of the major currencies which leads to more robust currency correlation estimates (see sections 2 and 3 in the global risk model publication, Balachander et al (2011) for further details.)

We estimate the stock exposures to each of the factors using the following stepwise procedure[1]. In the first step, the dependent variable is stock returns, and in each subsequent step, it is the residual of stock returns from the previous step.

1. Regional Market and FX (jointly)
2. Local Market
3. Style Factors
4. Industry Factors

In the first step, the independent effects of the regional market and currency factor are jointly estimated and regressed out of the stock returns measured in local currency. We have a total of 34 currency factors, but for each stock we only apply the currency factor corresponding to the currency in which the stock is traded. Second, the residual returns series from the previous step are regressed against the returns of the local country of domicile returns. Finally, the residual returns from step 3 are regressed against the Style and then Industry factor returns.

In the order of estimation, it is of note that we compute the market neutral style factor exposures before we proceed to compute the market and style neutral industry exposures. This ordering ensures that the loadings on our comprehensive style factors take precedence in the interpretation of portfolio exposures. Nevertheless, the desired order of imposing independence among the factor groups may be different for different managers. In practice, industry loadings can be measured independent of style loadings by aggregating up issue level industry exposures and associated contributions to risk and return. Additionally, the order of independence does not affect the quality of the risk forecast.

A global portfolio manager will typically forecast risk and evaluate performance from a home currency perspective. Our Pan-European and Pan-Asian models are currently constructed from a Euro and USD currency investor perspective respectively. However the models can be easily converted into any currency perspective of choice by transformations of the matrices. These transformations are already implemented natively in the Capital IQ Portfolio Analytics platform.

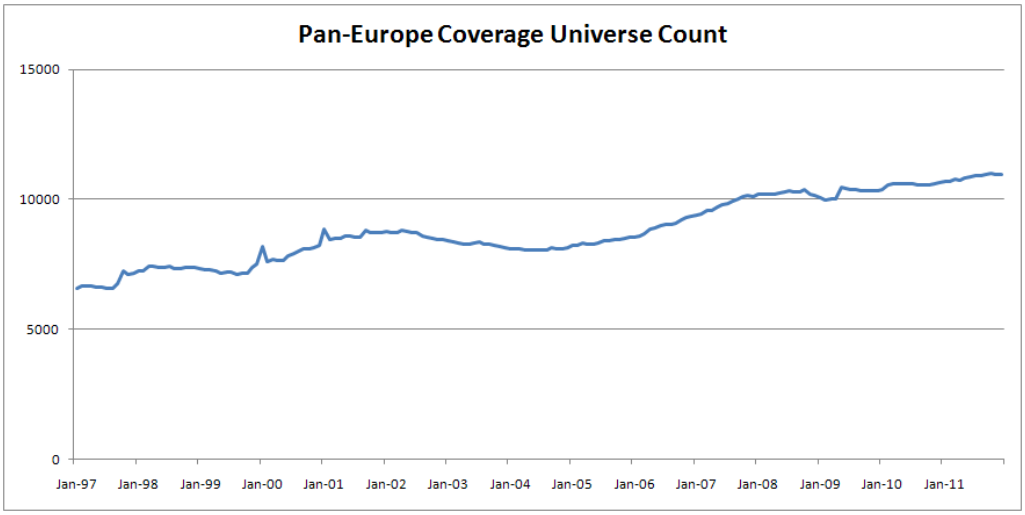
Note that the estimation universe for our Regional models comprises the full BMI for the relevant regions. Thus all the factor returns are estimated based on stocks within this set.

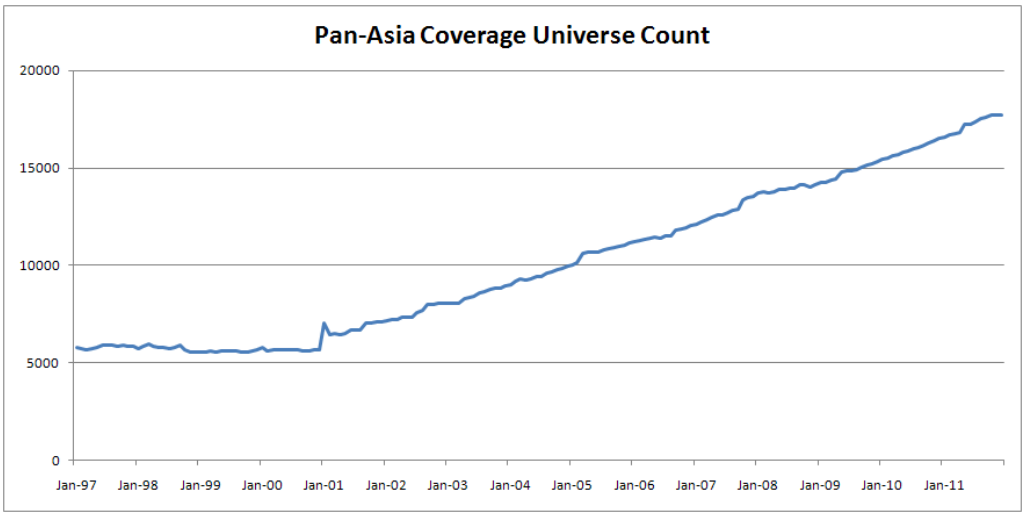
[1] See Table 14 and Table 15 in Appendix A for order in which market factors are applied depending on domicile of stock

However the coverage universe, i.e. the set of stocks for which we estimate risk factor exposures, is a much broader set of stocks and includes countries other than those covered by the BMI index (Table 14 & Table 15 in Appendix A).

Thus for Dec 2011, the Pan-European model covers about 11,000 equities and the Pan-Asia ex. Japan model about 17,500 equities. Figure 3 below shows the coverage count through time for the Pan-European and Pan-Asian models.

Figure 3: Number of assets covered by the Regional Models





Source: S&P Capital IQ.

2.2 Data

The data used is again similar to that used in developing the Global Risk Model. Table 4 gives a summary of the style factor part of the data wherein we used 120+ factors from the S&P CIQ Alpha Factor Library grouped down into 8 style buckets. Each style factor is constructed from a long/short cash neutral signal portfolio. These portfolios are derived from a univariate sort that determines the top 33% of stocks (longs) according to the chosen characteristic and the bottom 33% (shorts).

Table 4: Style Factor Descriptions from the S&P Capital IQ Alpha Factor Library

Style	# of signal factors	Sample Components
Analyst Expectation	11	- Earnings & Sales Forecast - Earnings Surprise - Analyst Diffusion - Analyst Revision
Capital Efficiency	10	- Return on Equity & Capital - Leverage & Interest Coverage - Issuance & Buybacks
Earnings Quality	25	- Balance Sheet Accruals - Working Capital & Asset Turnover - Capital Expenditure and R&D Intensity - Margins, Payout Ratio
Historical Growth	31	- 1 & 3-year growth of - Operating & Free Cash Flow - Earnings - Margins
Price Momentum	17	- 1, 6, 9 & 12-Month Price Momentum - Technical indicators over various time frames, including MACD, RSI, Slope, 52 Week High/Low
Size	2	- Log of Market Cap. & Sales
Valuation	25	- Reported & Forward Earnings Yield - Dividend Yield - Book to Price - Sales, EBITDA & Cash Flow to Enterprise Value - Inverse PEGY
Volatility	7	- Realized volatility - CAPM Beta - Distance from High to Low (1 & 12 months) - Trading Volume

Source: S&P Capital IQ. Signal Factors used in Model Construction as of May 31, 2012.

3 Risk Model Testing

We evaluate the performance of our regional risk models on a set of benchmark portfolios.

The benchmarks were carefully chosen to include regionally focused portfolios. In Table 5 and Table 6 the "MSCI" Group consists of MSCI® portfolios which have start dates in early 2004. To include test portfolios over which we can evaluate our risk models which start in 1997, we specially constructed an additional "Test" portfolio which has history from 1997 through 2011.

Also we constructed two additional broad equal weighted ("BMI") portfolios of stocks in the BMI within each region – the large cap and small cap portfolios were constructed by taking the top and bottom half of the stocks arranged by market capitalization. The portfolios constructed for testing in the Pan-European case were additionally rebalanced yearly. For the purposes of testing, all portfolios have history through Dec 2011.

Table 5: European Test Portfolios

	PORTFOLIO	Group
1	AC EU	MSCI
2	AC Europe	MSCI
3	DM Europe	MSCI
4	DM Nordic Countries	MSCI
5	EM Europe	MSCI
6	Equal Weighted Portf – Europe	Test
7	BMI Pan-Europe Small Cap	BMI
8	BMI Pan-Europe Large Cap	BMI

Table 6: Asia Ex-Japan Test Portfolios

	PORTFOLIO	Group
1	EM Asia	MSCI
2	EM Far East	MSCI
3	Equal Weighted Portf – Asia Ex Japan	Test
4	BMI Pan-Asia ex-Japan SmallCap	BMI
5	BMI Pan-Asia ex-Japan LargeCap	BMI

To test the performance of the regional models, the results are compared against the risk prediction from our revised Global Risk Model. For the Pan-Europe models we use the time series of returns of the test portfolios expressed in local currencies to test the performance. For the Pan-Asian model comparison we use the risk calculated from returns expressed in USD.

The Diebold-Mariano (DM) test in Table 7 measures the average t-stat of the accuracy improvement in the mean standard error (MSE) of the risk forecasts generated by the regional versus global models when compared to the actual realized risk of the test portfolios over the test period. The results (avg t-stat around 0) show about equal performance in predicting risk by the Pan-European and global models when using our European test portfolios. The results for the Pan-Asian model show improved performance when using our Asian test portfolios, although not statistically significant at the 95% confidence level.

The models are constructed using 2 years of rolling historical daily data. We used medium term models that have a Factor Correlation Half Life and a Factor Variance Half Life of 240 and 60 business days respectively.

Table 7: Test Results for Regional Model

(Avg t-stat of DM MSE Test)

	All	MSCI	Test	BMI
Pan-European Model	-0.15	-0.24	0.38	-0.19
Pan-Asian Model	1.02	0.79	0.62	1.45

Source: S&P Capital IQ. Table provided for illustrative purposes only.

The average bias statistic reported in Table 8 also shows slightly improved performance using the Regional models over the Global model with an overall bias statistic closer to 1.0.

Table 8: Model Bias Statistics averaged across Test Portfolios

	Pan-European Portfolios		Pan-Asian Portfolios	
	Global Model	Pan-European Model	Global	Pan-Asian Model
Bias	1.20	1.18	1.19	1.15

Source: S&P Capital IQ. Table provided for illustrative purposes only.

However, risk models have another important function, which is to allow for intuitive interpretation of risk and performance attribution. In the next section we focus on providing insight on how Regional risk models are more relevant for professionals managing regional portfolios in terms of understanding and attributing their risk and return characteristics.

4 Regional Model Relevance

We consider sample portfolios that consist of concentrated industry portfolios constructed by equally weighing stocks from the Pan-European region grouped according to their GICS 2 classification. We picked a few of the top names (by market cap) within the corresponding industries for each sample portfolio. Table 9 gives details on these sample portfolios.

Table 9: Sample European Industry Portfolios

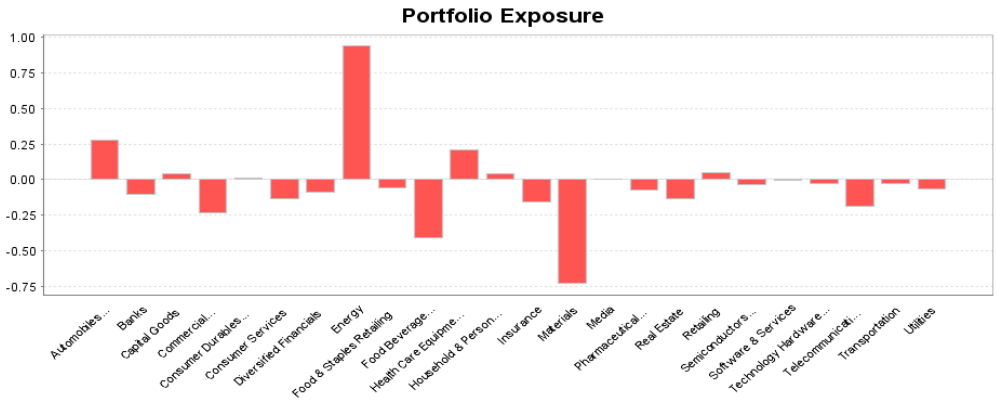
Portfolio	Equal Weighted Constituents
British Energy	BP
Danish Banks	JYSKE BANK
	SYDBANK AS
	SPAR NORD BANK A/S
	RINGKJOBING
	LANDBOBANK A/S
	DANSKE BANK AS
German Automobiles	DAIMLER AG
	VOLKSWAGEN AG
	BMW-BAYER
	MOTOREN WERKE AG
Swiss Pharmaceuticals	ACTELION LTD
	NOVARTIS AG
	ROCHE HOLDING AG

Source: S&P Capital IQ

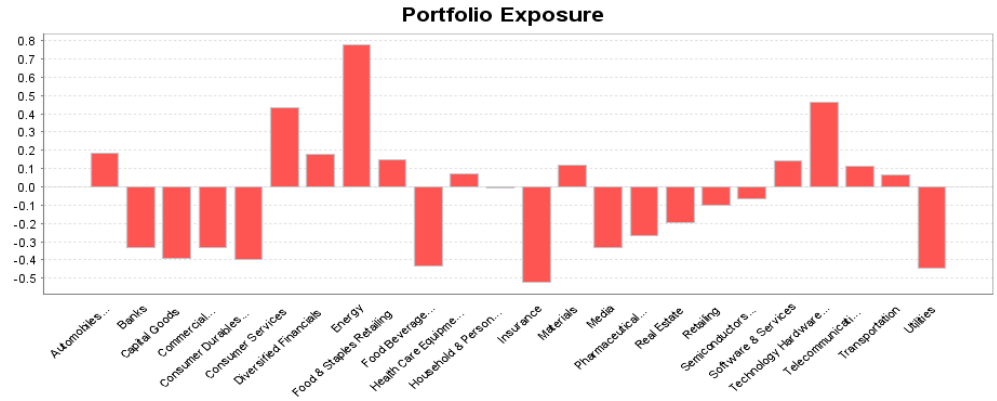
Figure 4 below shows the industry exposures of the British Energy portfolio. The top sub-panel and bottom sub-panel are industry exposures using the Pan-European and global models respectively (The charts for the other portfolios specified in Table 9 are included in Appendix A: Figure 7, Figure 8 and Figure 9) for Dec 2011.

Figure 4: Industry Exposures[2] of British Energy Portfolio (BP)

(a) Industry exposures using the Pan-European model



(b) Industry exposures using the Global model



Source: S&P Capital IQ. Dec 2011. Charts provided for illustrative purposes only.

In both cases, the Energy industry exposure is consistent with what one would associate with BP, i.e. both the Pan-European and global models show the highest exposure to Energy. The Pan-European model shows only slightly more pronounced exposures to the Energy industry, but importantly, much more muted exposures to the other industries when compared to the global model. Thus the regional model produces more accurate and intuitive overall industry exposures in this case.

We capture this effect through a normalized concentration value $\mathrm{CV} = (x_{own}^2 / \sum_{i \in \text{sectors}} x_i^2)$ where x represents the exposure to an industry. A value closer to 1 would indicate that the model produced attribution has higher exposures to the expected industry relative to others.

2 Exposures represent the Beta of the portfolio to the corresponding market, sector or style. Thus a portfolio with an Automobile exposure of 0.25 means that the portfolio will capture 25% of the returns experienced by the Automobile sector over the same time period.

Table 10: Industry Exposure Concentration values for different Pan-European portfolios using the Pan-European and Global model respectively

Sample Portfolio	Exposure Concentration Value	
	Pan-European	Global
British Energy	46.7%	23.3%
Denmark Banks	16.9%	5.8%
German Automobiles	68.7%	25.3%
Swiss Pharmaceuticals	74.5%	57.6%

Source: S&P Capital IQ. Dec 2011.

As can be seen from Table 10 above, the concentration values are higher for the Pan-European model vis-à-vis the Global model which shows that the former model produces more relevant exposures.

We performed a similar analysis using the Pan-Asian model and Table 11 details the concentrated industry portfolios constructed for the Pan-Asian Region.

Table 11: Sample Pan-Asian Industry Portfolios

Sample Portfolio	Equal Weighted Constituents
Indian Energy	OIL & NATURAL GAS CORP LTD
	RELIANCE INDUSTRIES LTD
	COAL INDIA LTD
Chinese Banks	CHINA CONSTR BANK CORP
	AGRICULTURAL BANK OF CHINA
	INDUSTRIAL & COMM BANKCHINA
Korean Automobiles	KIA MOTORS CORP
	HANKOOK TIRE CO LTD
	HYUNDAI MOTOR CO LTD
Australian Retailing	HARVEY NORMAN HLDGS LTD
	MYER HOLDINGS LTD
	SUPER RETAIL GROUP LTD

Source: S&P Capital IQ

As can be seen from Figure 5, the portfolio exposure shows that the industry exposures are more relevant using the Pan-Asian risk model. (Appendix A shows the charts for the other 3 portfolios tested in Figure 10, Figure 11 and Figure 12)

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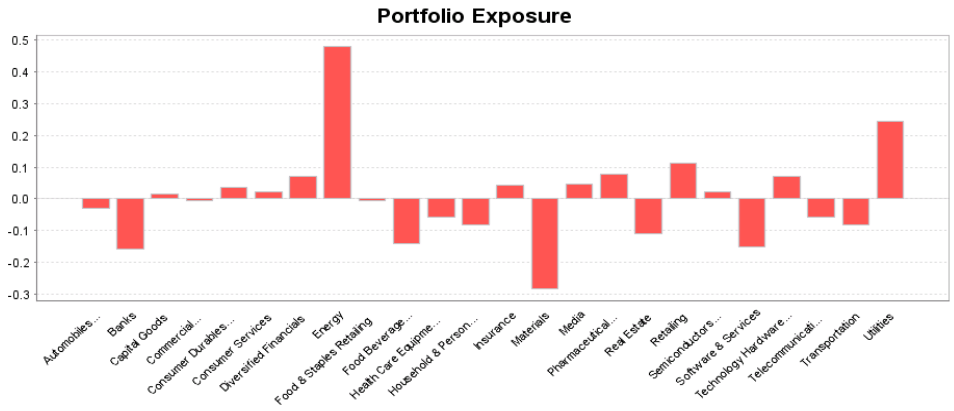
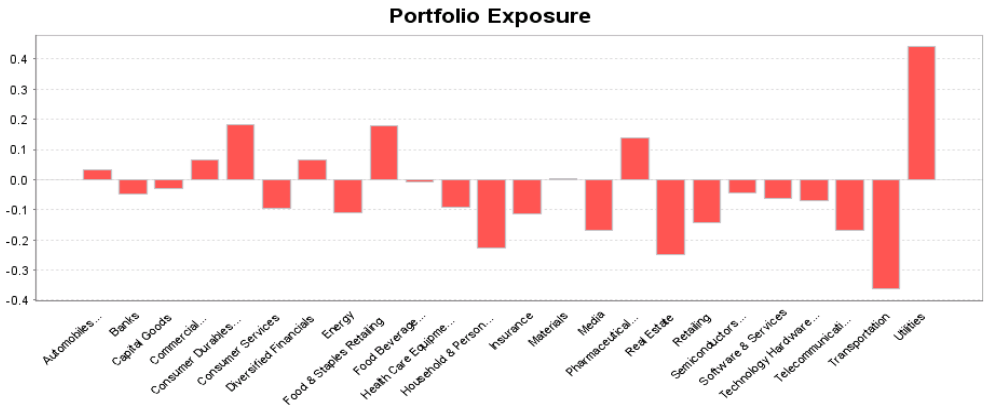
Figure 5: Industry Exposures of Indian Energy Portfolio (ONGC, Reliance Industries, Coal India)

(a) Industry exposures using the Pan-Asian model



(b) Industry exposures using the Global model



Source: S&P Capital IQ. Dec 2011. Charts provided for illustrative purposes only.

The corresponding industry exposure concentration values presented in Table 12 have larger values for the Pan-Asian model compared to the Global model, reinforcing that regional models provide more relevant industry exposures for regional portfolios.

Table 12: Industry Exposure Concentration values for the different Pan-Asian portfolios

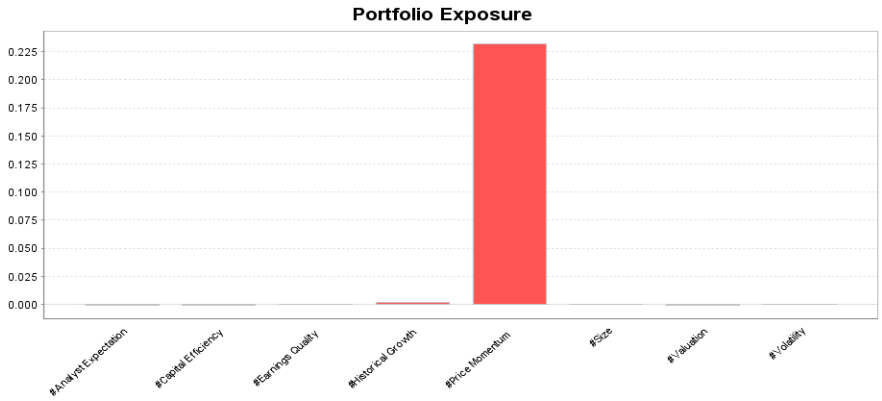
	Exposure Concentration Value	
	Pan-Asian	Global
Indian Energy	45.9%	1.9%
Singapore Banks	14.8%	0.2%
Korean Automobiles	63.9%	31.9%
Australian Retailing	39.9%	12.7%

Source: S&P Capital IQ. Dec 2011

Finally, we constructed a Market Neutral Long/Short Minimum Variance portfolio of stocks in the Pan-European region using the ClariFI Portfolio Optimizer and the Pan-European risk model. We constrain the portfolio to impose a 20% Price Momentum exposure and neutrality to the other style factors. From
Figure 6, which compares the resulting style exposures using the two risk models, we can see that the regional model produces the expected exposures. While the global model also shows the intended Price Momentum exposure, it also shows exposure to other styles which the Pan-European model (by construction) does not.

Figure 6: Market Neutral Long-Short Minimum Variance European Portfolio

(a) Style exposures using the Pan-European model



(b) Style exposures using the Global model

Source: S&P Capital IQ. Dec 2011. Charts provided for illustrative purposes only.

Table 13 summarizes this result by showing the risk breakdown along the intended (Price Momentum) and unintended (other 7) style factors. Granted, this result is not surprising, but it shows that style exposures and hence risk are highly dependent on using the relevant regional model for risk attribution purposes.

Table 13: Style Risk breakdown for the Market Neutral Long/Short Minimum Variance Style tilted portfolio using the two different Risk Models

% Contribution to Style Risk			
Pan-European		Global	
PriceMom	Other Styles	PriceMom	Other Styles
100%	0%	66%	34%

Source: S&P Capital IQ. Dec 2011

5 Summary

In this paper we have outlined the changes to our US and global equity risk model construction methodology. Following a similar methodology, we have produced our regional equity risk models (Pan-Europe and Pan-Asia), and we have summarized the salient aspects of constructing these models. We have presented the results of testing the resulting regional model out of sample and highlighted the advantage of using a region specific model for portfolios that are limited to specific geographies.

For more information on the Capital IQ Equity Risk Models please contact Ruben Falk at rfalk@spcapitaliq.com

References

B. Scherer, B. Balachander, R. Falk and B. Yen, “Introducing Capital IQ’s Fundamental US Equity Risk Models”, July 2010

B. Balachander, R. Falk, V. Liu and B. Scherer, “Introducing Capital IQ’s Global Fundamental Equity Risk Models”, May 2011

Appendix A

Table 14: Order in which region/country exposures are determined on domicile of stock (Country) for Pan-European model.

Country	First	Second
Albania	Region European	
Austria	Region European	Country Austria
Belgium	Region European	Country Belgium
Bosnia and Herzegovina	Region European	
Bulgaria	Region European	
Croatia	Region European	
Cyprus	Region European	
Czech Republic	Region European	Country Czech Republic
Denmark	Region European	Country Denmark
Estonia	Region European	
Falkland Islands	Region European	
Faroe Islands	Region European	
Finland	Region European	Country Finland
France	Region European	Country France
Georgia	Region European	
Germany	Region European	Country Germany
Gibraltar	Region European	
Greece	Region European	Country Greece
Greenland	Region European	
Hungary	Region European	Country Hungary
Iceland	Region European	
Ireland	Region European	Country Ireland
Italy	Region European	Country Italy
Jersey	Region European	
Kazakhstan	Region European	
Latvia	Region European	
Liechtenstein	Region European	
Lithuania	Region European	
Luxembourg	Region European	Country Luxembourg
Macedonia	Region European	
Malta	Region European	
Monaco	Region European	
Netherlands	Region European	Country Netherlands
Netherlands Antilles	Region European	
Norway	Region European	Country Norway
Poland	Region European	Country Poland
Portugal	Region European	Country Portugal
Romania	Region European	
Russian Federation	Region European	Country Russian
Serbia	Region European	
Slovakia	Region European	
Slovenia	Region European	
Spain	Region European	Country Spain
Sweden	Region European	Country Sweden
Switzerland	Region European	Country Switzerland
Turkey	Region European	Country Turkey
Ukraine	Region European	
United Kingdom	Region European	Country United Kingdom
Virgin Islands, British	Region European	

Source: S&P Capital IQ

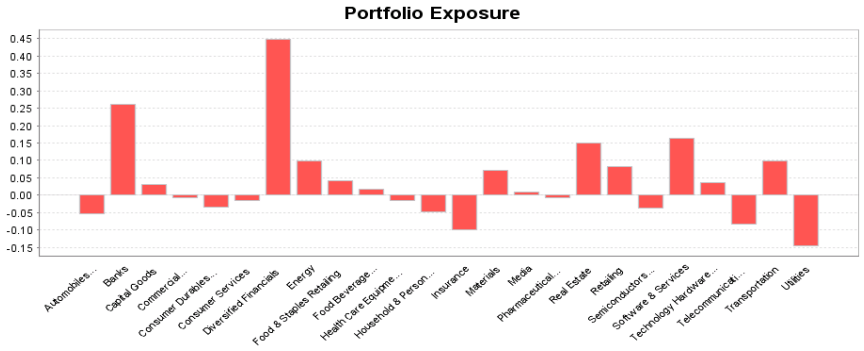
Table 15: Order in which region/country exposures are determined on domicile of stock (Country) for Pan-Asian model.

Country	First	Second
Australia	Region PanAsiaExJapan	Country Australia
Bangladesh	Region PanAsiaExJapan	
China	Region PanAsiaExJapan	Country China
Hong Kong	Region PanAsiaExJapan	Country Hong Kong
India	Region PanAsiaExJapan	Country India
Indonesia	Region PanAsiaExJapan	Country Indonesia
Korea, Republic of	Region PanAsiaExJapan	Country Korea
Macao	Region PanAsiaExJapan	
Malaysia	Region PanAsiaExJapan	Country Malaysia
New Zealand	Region PanAsiaExJapan	Country New Zealand
Pakistan	Region PanAsiaExJapan	
Papua New Guinea	Region PanAsiaExJapan	
Philippines	Region PanAsiaExJapan	Country Philippines
Singapore	Region PanAsiaExJapan	Country Singapore
Solomon Islands	Region PanAsiaExJapan	
Sri Lanka	Region PanAsiaExJapan	
Taiwan, Province of	Region PanAsiaExJapan	Country Taiwan
Thailand	Region PanAsiaExJapan	Country Thailand
Viet Nam	Region PanAsiaExJapan	

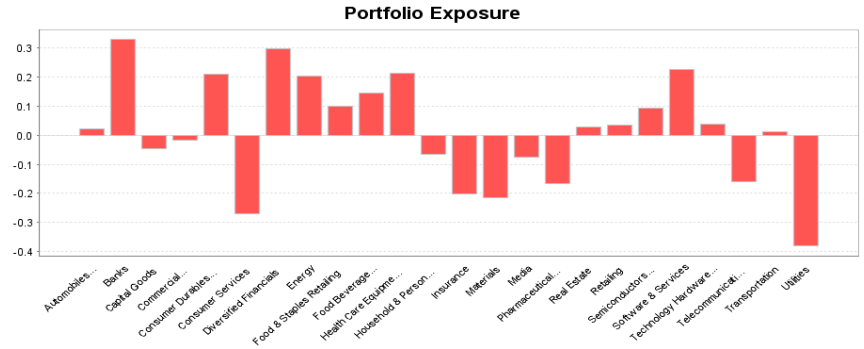
Source: S&P Capital IQ

Figure 7: Danish Bank Portfolio (Danske, Jyske, Sydbank, Spar Nord and Ringkjobing Landbobank)

(a) Industry exposures using the Pan-European model



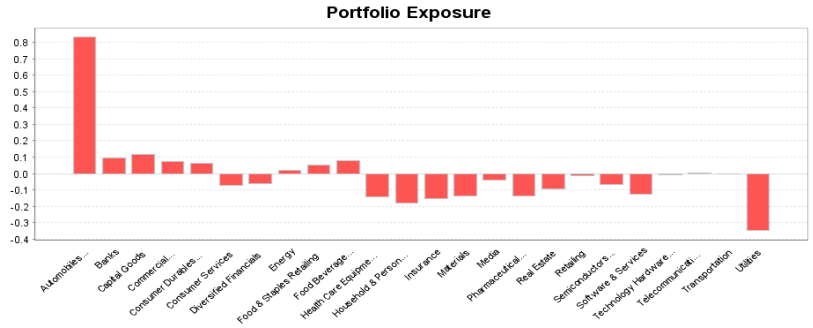
(b) Industry exposures using the Global model



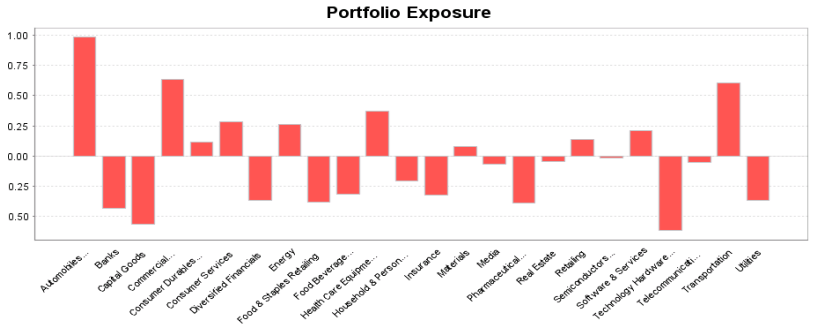
Source: S&P Capital IQ. Dec 2011. Charts provided for illustrative purposes only.

Figure 8: German Automobile Portfolio (Daimler, BMW and Volkswagen)

(a) Industry exposures using the Pan-European model



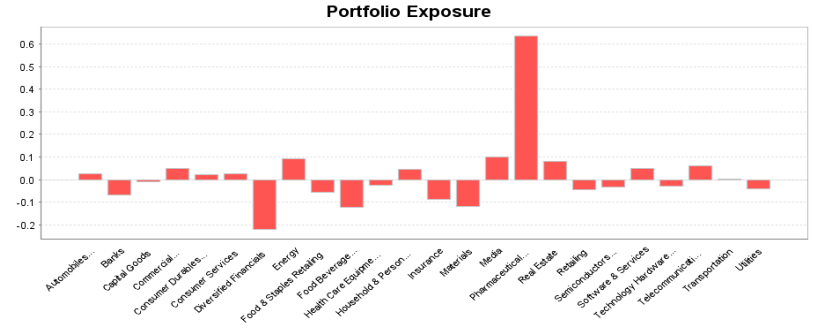
(b) Industry exposures using the Global model



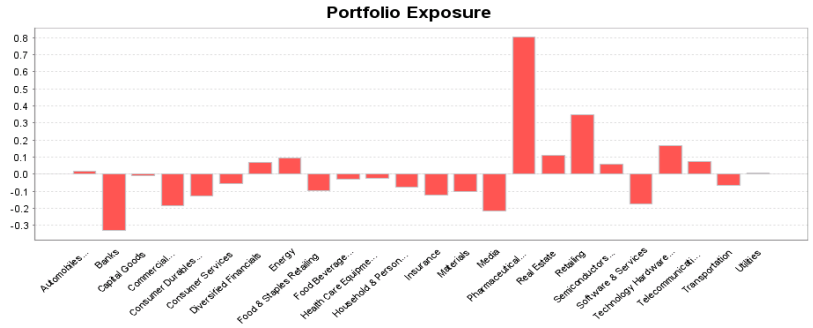
Source: S&P Capital IQ. Dec 2011. Charts provided for illustrative purposes only.

Figure 9: Swiss Pharmaceuticals Portfolio (Roche, Novartis and Actelion)

(a) Industry exposures using the Pan-European model



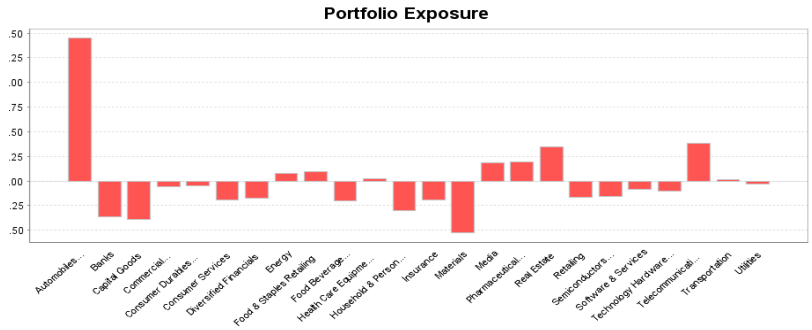
(b) Industry exposures using the Global model



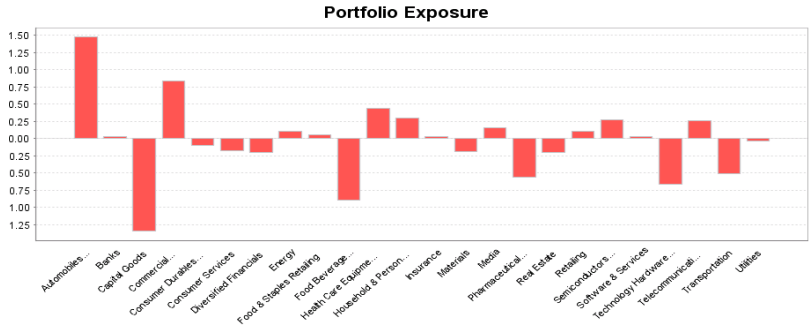
Source: S&P Capital IQ. Dec 2011. Charts provided for illustrative purposes only.

Figure 10: Korean Automobile Portfolio (Kia, Hyundai, Hankook Tire)

(a) Industry exposures using the Pan-Asian model



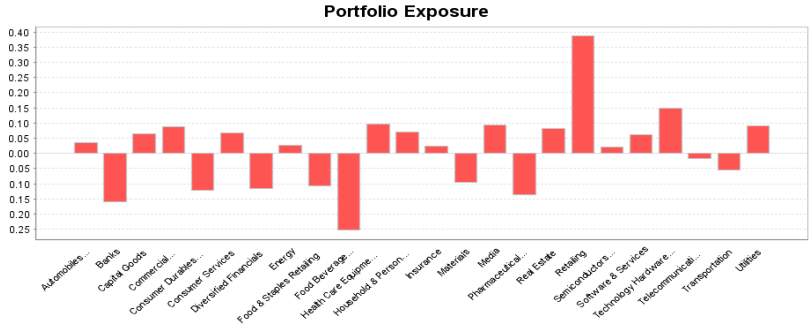
(b) Industry exposures using the Global model



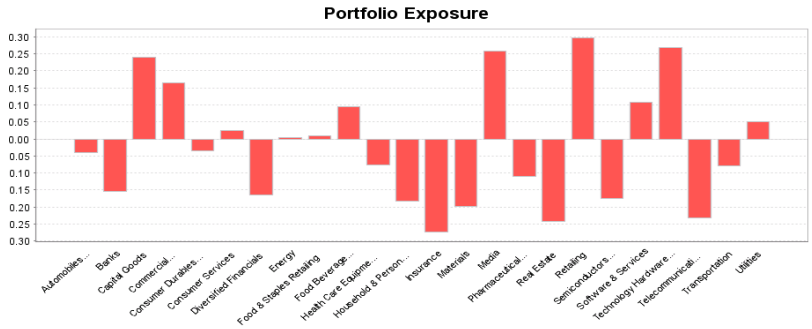
Source: S&P Capital IQ. Dec 2011. Charts provided for illustrative purposes only.

Figure 11: Australian Retailing Portfolio (Harvey Norman, Super Retail, Myer)

(a) Industry exposures using the Pan-Asian model



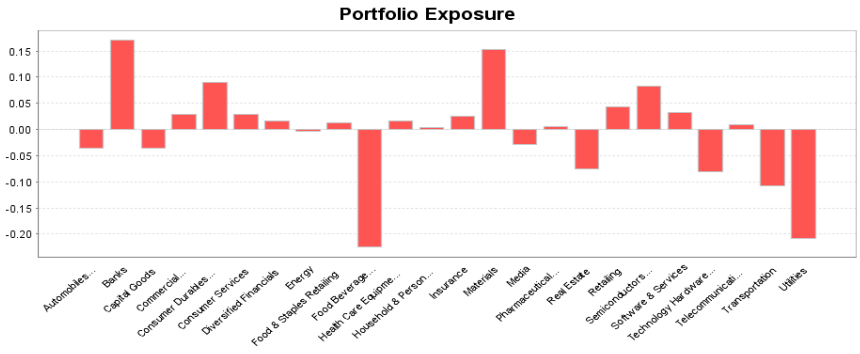
(b) Industry exposures using the Global model



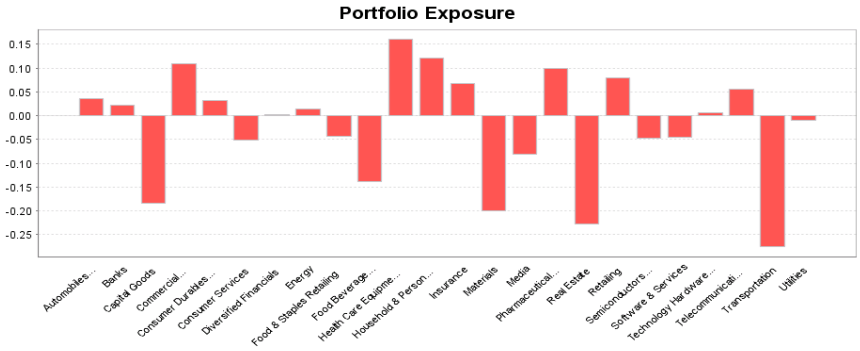
Source: S&P Capital IQ. Dec 2011. Charts provided for illustrative purposes only.

Figure 12: Singapore Banks Portfolio (United Overseas, DBS Group, Oversea Chinese Banking)

(a) Industry exposures using the Pan-Asian model



(b) Industry exposures using the Global model



Source: S&P Capital IQ. Dec 2011. Charts provided for illustrative purposes only.

Our Recent Research

June 2012: Riding Industry Momentum – Enhancing the Residual Reversal Factor
Unlike individual stocks whose short-term returns tend to revert from one month to the next, industry portfolios exhibit return momentum even at a one-month horizon. We examine a strategy that takes advantage of both industry level momentum and stock level reversal. We combine our residual reversal factor with an industry momentum score, and find that the factor performance is greatly enhanced in the Russell 3000 universe between January 1987 and February 2012. The decile return spread is increased by 42 bps per month on average.

May 2012: The Oil & Gas Industry - Drilling for Alpha Using Global Point-in-Time Industry Data
In the oil & gas industry, a key determinant of value and future cash flow streams is the level of oil & gas reserves a firm holds. While most fundamental analysts/investors take into consideration a company's reserves in arriving at price targets, a majority of systematic driven processes do not. Using S&P Capital IQ's Global Point-in-Time database, we investigate the importance of reserve and production information provided by oil & gas companies.

May 2012: Case Study: S&P Capital IQ – The Platform for Investment Decisions
Ten years ago, AAPL traded just below $12 and closed at $583.98 on April 30, 2012. That is an average annual return of 48.1% over the period. During this same time the S&P 500 grew at an annual rate of only 2.65%. On April 2nd, Topeka Capital Markets initiated coverage of AAPL with a price target of $1001. If achieved, this would make AAPL the first company to ever reach a $1 trillion market cap. In this case study, we highlight some key S&P Capital IQ functionality in analyzing AAPL hypothetically reaching $1000:

March 2012: Exploring Alpha from the Securities Lending Marker – New Alpha Stemming from Improved Data
Numerous studies have examined the information content of short interest and found that heavily shorted stocks tend to underperform and liquid stocks with low levels of short interest subsequently outperform. Most studies relied on short interest data obtained directly from the exchanges available with a significant delay.

January 2012: S&P Capital IQ Stock Selection Model Review – Understanding the Drivers of Performance in 2011
In this report, we review the performance of S&P CIQ's four U.S stock selection models in 2011. These models were launched in January 2011, and this analysis will assess the underlying drivers of each model's performance over the last 12 months.

January 2012: Intelligent Estimates – A Superior Model of Earnings Surprise
As residual stakeholders, equity investors place enormous importance on a company's earnings. Analysts regularly forecast companies' future earnings. The prospects for a company's future earnings then become the basis for the price an investor will pay for a company's shares. Market participants follow sell side analysts' forecasts closely, identifying those analysts that demonstrate forecasting prowess and track those analysts' forecasts going forward.

December 2011: Factor Insight – Residual Reversal
Many investors employ price reversal strategies (strategies that buy "losers" and sell "winners" based on short-term price changes) in their stock selection decisions. One popular reversal strategy is constructed as the change in 1-month stock price over the most recent month. This report compares the performance of this factor to a "residual reversal" signal proposed by Blitz, Huij, Lansdorp and Verbeek in their 2011 paper, "Short-Term Residual Reversal".

November 2011: Research Brief: Return Correlation and Dispersion – All or Nothing

October 2011: The Banking Industry
Investors can improve model and portfolio risk adjusted returns using various approaches, including incorporating new alpha signals in an existing investment process. In this research piece, we build on our earlier work (See "Is your Bank Under Stress? Introducing our Dynamic Bank Model", November 2010), to determine if bank specific data provided by financial institutions regulatory bodies (FFIEC standardized data), can yield alpha signals orthogonal to those found in most stock selection models.

September 2011: Methods in Dynamic Weighting
In this report, we introduce a powerful discovery tool in Alphaworks and provide a pragmatic survey covering the identification and potential dynamic techniques to handle financial regimes and security level context. With increasingly volatile factor performance, the ability to implement adaptive strategies is paramount in maximizing factor efficacy.

September 2011: Research Brief: Return Correlation and Dispersion - Tough Times for Active Managers

July 2011: Research Briefs- A Topical Digest of Investment Strategy Insights

June 2011: A Retail Industry Strategy: Does Industry Specific Data tell a different story?

May 2011: Introducing S&P Capital IQ's Global Fundamental Equity Risk Models

May 2011: Topical Papers That Caught Our Interest

April 2011: Can Dividend Policy Changes Yield Alpha?

April 2011: CQA Spring 2011 Conference Notes

March 2011: How Much Alpha is in Preliminary Data?

February 2011: Industry Insights – Biotechnology: FDA Approval Catalyst Strategy

January 2011: US Stock Selection Models Introduction

January 2011: Variations on Minimum Variance

January 2011: Interesting and Influential Papers We Read in 2010

November 2010: Is your Bank Under Stress? Introducing our Dynamic Bank Model

October 2010: Getting the Most from Point-in-Time Data

October 2010: Another Brick in the Wall: The Historic Failure of Price Momentum

July 2010: Introducing S&P Capital IQ's Fundamental US Equity Risk Model