Capital IQ
A Standard & Poor's Business

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The Banking Industry
New Bank Specific Data as an Alpha Source

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. We test these new factors under different economic conditions and find that:

- **Over our entire test period, a majority of the factors we test yield statistically significant long-short returns and information coefficients**.

- **In a rising interest rate regime, factors with a value tilt are the most successful strategies to adopt**. Conversely, factors that look at the "health" of a bank's balance sheet, funding mix and capital adequacy are the most attractive to follow in periods where interest rates are falling.

- **In periods where the banking system is stressed, investors fixate on bank specific attributes**. Accordingly, strategies that are successful during this period are those that measure loan quality and the capacity of a bank to absorb credit losses.

- **Loan Loss Indicator, a signal based off loans & leases that have recently been classified as problematic, is the only indicator with statistically significant results in all the regimes we considered**.

- **Bank Specific Signals that we classify into Asset Quality, Capital Adequacy and Liquidity themes are generally uncorrelated with popular traditional factors.**

1 Introduction

In this report, we examine the dynamics and main drivers of performance in the banking industry using newly acquired FFIEC data. This unique data set was recently made available on Capital IQ's ("CIQ") research platform and offers a rich alternative to the common CIQ/Compustat bank data sets currently used by most researchers. Given the granularity of this new FFIEC data items, we hope to discover new and complimentary stock selection signals.

The banking industry is unique and characterized by:

- High level of regulation at the federal and state levels. These regulations have a direct impact on business lines that banks can engage in and their overall profitability levels.
- Some of the most common and effective stock selection signals, such as cashflow yield and accruals, cannot be applied directly in the banking industry due to the nature of a bank assets and liabilities. This difference in banks' assets and liabilities compared to those of other industries is a major reason for academia frequently excluding banks from empirical anomaly studies.
- The industry is one of the largest by market capitalization within the U.S equity market. Figure 1 shows the market capitalization of bank stocks in the Russell 3000 as a percentage of total market capitalization of the index. Bank industry weight peaked at 11.67% in October 2003 and has averaged 7.75% over the last 25 years. Given its importance in the Russell index, separating winners from losers has a meaningful impact on a portfolio's return and relative over/under performance.

**Figure 1: Bank Market Capitalization as a Proportion of Total Capitalization of Russell 3000
December 1987 – August 2011**
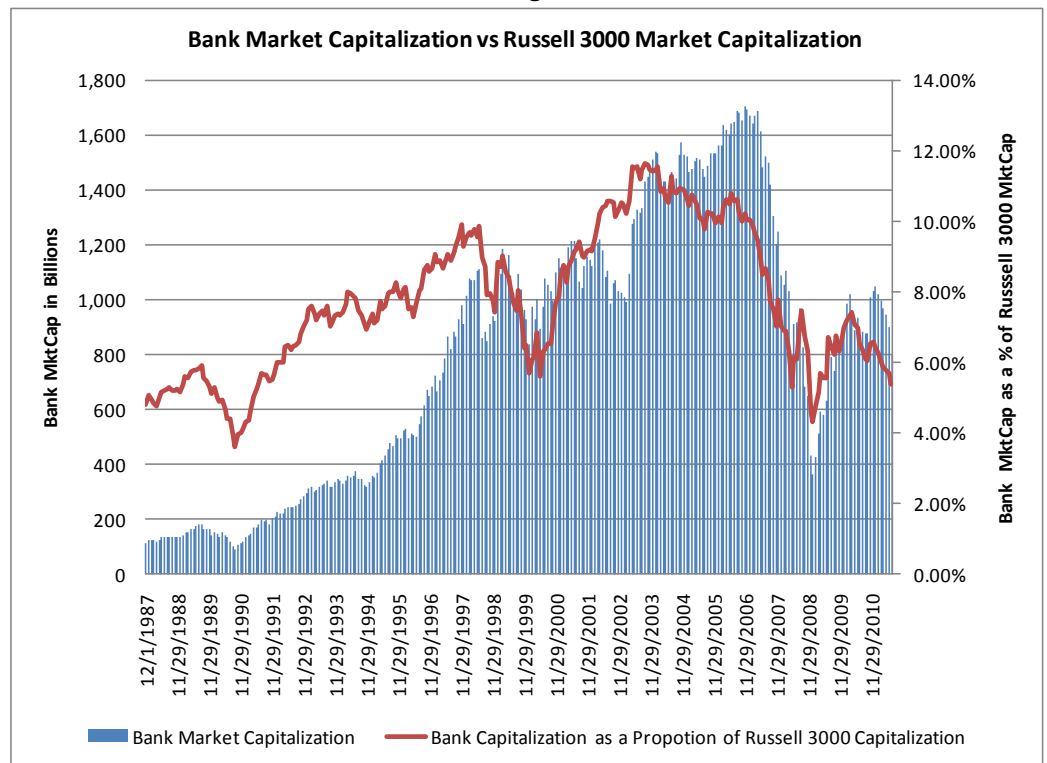
2 Factor Formulation and Testing

Table 2 lists 16 newly tested factors and their descriptions. We also included the order of ranking factors ascending or descending, "A" and "D" respectively.

Table 2: Factor Definitions

Theme	Factor	Description	Direction
Asset Quality	Problem Loan Ratio (Non-Accrual Loans + Loans Past Due / Total Assets)	A high ratio is an indication of poor underwriting standards and/or deteriorating economic environment. Banks with high ratios will witness reduced profitability and capital ratios will be pressured.	A
	Provision Rate (Provision for Loan & Lease Losses divided by total assets)	Banks are required to regularly evaluate their loan & lease books and make provisions for potential credit losses based on reugatory standards and management's judgement. A high ratio might be an indication of a deteriorating loan book.	A
	Non Performing Assets / Earning Assets ("NonPerAstEA")	Earning Assets are a bank's principal source of revenue; banks with high factor values are not operating at optimal levels and will see compressed revenue/earnings compared to banks with low factor values.	A
	Loan Diversity $$\sum_{i=1}^{n}\left(LoanType/GrossLoan\right)^{2}$$	This ratio is a variation of the herfindahl index and is used to determine a bank's concentration risk. Low values indicate a bank has a balanced portfolio mix and is not concentrated in one or two product lines.	A
	Loan Loss Indicator (30-89 days Loans & Leases Past Due + 90 days Loans & Leases Past Due) / Total Loans & Leases	Commercial loans that go unserviced for 90-days might have to be restructured, while consumer loans may be written off. Both actions impact profits and capital levels.	A
	Year-on-Year Change in 30-89 Days Loans & Leases Past Due / Total Loans & Leases ("YoYChg30DLTL")	Loans and leases 30-89 days past due are the first signs of a deterioration in a bank's loan book. A rapid growth in this ratio might lead to future write downs.	A
Capital Adequacy	Tier 1 Capital Ratio (Tier 1 Capital / Total Risk Weighted Assets)	A measure of a bank's ability to absorb losses arising from its credit portfolio; banks with higher ratios are in a better position to absorb losses due to adverse macro-economic conditions.	D
	Texas Ratio ((Non Performing Loans + Other Real Estate Loans) /(Tangible Common Equity + Loan Loss Reserves))	The Texas Ratio is a measure used to determine the likelihood of a bank failing. Ratios above 1 indicate that a bank is at risk of failing. Other Real Estate Loans are non-performing loans, typically foreclosed real estate loans	A
	Loss Absorption Power (Non Accrual Loans + Loans Past due / (Tangible Common Equity + Loan Loss Reserves))	This factor examines a bank's ability to absorb all the problem loans on its books. Loan Loss Reserves are added to tangible book value since these reserves form part of a bank's "buffer" for loan write-downs.	A
Liquidity / Funding Mix	Core Deposit Mix (Core Deposit / Total Deposit)	Core deposits provide a stable cost of funding and are less interest rate sensitive than most other types of funding.	D
	Deposit Cost	This ratio is calculated by dividing the total interest paid on all deposits by the average balance of interest bearing deposits. A high ratio suggests that a bank can't attract cheap sources of funding (checking accounts)	A
	Loan Funding (Loans and Leases / Core Deposits)	The factor measures the level of a bank's loans that is funded by stable deposits. Banks with low factor values are funding a higher proportion of their assets with cheap liabilities compared to banks with high values.	A
Profitability	Adjusted Operating Income / Total Assets ("OpIncAssets")	Adjusted operating income is net interest income (adjusted for tax benefit associated with income exempt from state/federal taxes) plus non-interest income. This ratio is a measure of how efficiently a bank is using its assets to generate income.	D
	Cost Efficiency (Non Interest Expense / Non Interest Income)	This ratio is an important measure of efficiency, especially in periods where net-interest margins are being squeezed.	A
Valuation	Tangible Book Value / Price ("TBVP")	A valuation metric that measures how "cheap" a bank is trading relative to its tangible book value.	D
	Pre-Provision Profit / Price ("PPPP")	One of the popular metrics that analysts use, as it makes earnings comparable across banks, given the discretion banks have in loan loss provisioning.	D

We grouped the factors we tested into five broad themes:

- Asset Quality – The quality of a bank's assets has a direct impact on both profitability and ultimately, capital levels. A rapid deterioration in asset quality leads to increased provisioning for loan losses and lower capital levels if the provisions are large and/or re-occurring.
- Capital Adequacy – Factors in this group look at the ability of banks to absorb losses. The cost of under-capitalization is significant, as under-capitalized banks will have to raise capital levels

by raising new equity, which is dilutive to existing equity holders; restrict loan growth, which impacts profitability negatively; or sell assets.

- Liquidity/Funding Mix – Liquidity measures the ability of a bank to fund new assets and meet its obligations as they fall due. Factors in this bucket examine the sources of a bank's liabilities and their associated cost. Banks with access to cheap and stable deposits should outperform their counterparts that are dependent on expensive and volatile sources of funding in the long run.
- Profitability: This theme captures how efficiently banks are deploying capital, cost-to-income ratios and earnings volatility. Banks that are efficiently managed should provide superior risk-adjusted returns to investors.
- Valuation: This theme is composed of factors that examine how "cheap" stocks are trading based on fundamentals, such as tangible book value. Stocks trading at attractive valuation multiples have historically out-performed those trading at rich multiples.

2.1 Factor Test Results

We provide test results for banks within the Russell 3000, including t-statistics, information ratios (IR), test start dates and average data counts in Table 3. 1-month returns are based on the returns to a long-short, equal-weighted portfolio using quartiles. Start date is the earliest date data is available for each factor and signifies the date we commenced our back-test. The majority of our factor tests begin in December 1987, with the latest start date being May 2002. We show our results by factor theme, ordered by absolute 1-month information coefficient.

Table 3: Bank Factors Performance Summary
Bank Universe (Start-Date to August 2011)

Factor	Start Date	Count	1M-IC	1M-IC-IR	1M-IC-Tstat	1M-Return	1M-Return-IR	1M-Return-Tstat
Asset Quality								
YoYChg30DLTL	May-02	207	0.037	0.44	4.60	0.97%	0.37	3.89
Loan Loss Indicator	Dec-87	188	0.035	0.34	5.31	0.65%	0.22	3.44
Problem Loan Ratio	Nov-90	189	0.025	0.17	2.70	0.49%	0.11	1.81
Loan Diversity	Dec-87	190	0.025	0.20	3.29	0.48%	0.16	2.68
NonPerAstEA	Dec-87	186	0.024	0.16	2.77	0.43%	0.10	1.77
Provision Rate	Dec-87	186	0.015	0.10	1.62	0.38%	0.09	1.49
Capital Adequacy								
Texas Ratio	Dec-87	189	0.023	0.15	2.60	0.47%	0.10	1.76
Loss Absorption Power	Nov-90	189	0.022	0.14	2.17	0.48%	0.10	1.59
Tier One Capital	May-91	170	-0.005	-0.03	-0.44	0.12%	0.03	0.54
Liquidity / Funding Mix								
Loan Funding	Dec-87	189	0.026	0.19	3.23	0.75%	0.25	4.24
Deposit cost	Dec-87	189	0.020	0.18	3.08	0.36%	0.13	2.23
Core Deposit Mix	Dec-87	189	0.015	0.14	2.37	0.38%	0.15	2.50
Profitability								
Cost Efficiency	Dec-87	189	0.017	0.10	1.69	0.29%	0.08	1.32
OpIncAssets	Dec-87	189	0.015	0.13	2.16	0.27%	0.09	1.52
Valuation								
PPPP	Dec-87	189	0.059	0.38	6.38	1.10%	0.27	4.59
TBVP	Dec-87	188	0.034	0.20	3.38	0.85%	0.17	2.92

Pre-Provision Profit to Price ("PPPP") is the strongest factor from both an absolute IC (0.059) and return (1.10%) perspective. On the other hand, Tier One Capital, one of the most widely used metrics to judge the "soundness" of banks, is the worst signal (absolute IC/return and IR) out of our entire factor set. Investors that used this signal for stock-selection over the 20-year period we conducted our test have not been rewarded for picking the most capitalized banks as determined by Tier One Capital. It is possible that

banks with Tier-One Capitals higher than the industry norm have portfolios tilted towards low yielding/safe assets. This asset mix may be a drag on profitability, especially during periods of sustained economic growth when risk-taking is rewarded.

Only two factors (Tier One Capital and Provision Rate), do not have either statistically significant IC or return spreads at the 10% level (two-tailed test). The two other metrics that we use to measure the ability of a bank to withstand losses (Texas Ratio and Loss Absorption Power), yield decent and similar performance profiles (IC/return spread/IR). Within the Asset Quality Theme, the two best signals are those that serve as early warning indicators of a potential deterioration in a bank's loan portfolio. This suggests that investors who quickly adjust their portfolios at the outset of trouble can potentially avoid future losses. Loan diversity, which measures how diversified a bank's loan portfolio is, has provided a respectable pay-off over the last two decades, with both ICs and return spreads statistically significant at the 1% level.

All three factors that look at funding costs and bank liquidity show statistically significant ICs and return spreads at the 5% level, indicating that banks with access to cheap sources of funding will outperform their peers who rely on more expensive sources of funding. TBVP is a relatively strong predictor of stock outperformance and it ranks in the top 5 of our factor set in terms of absolute IC and return.

2.2 Rising vs Falling Interest Rate Environment

With interest rates at historic lows, a topical issue is the impact of rising interest rates on bank profit and stock performance. Extant academic literature is inconclusive on the impact of changes in interest rates on bank returns. Lloyd and Shick (1977) found that less than 10% of the banks in their sample showed any significant response to changes in interest rates. Chance and Lane (1990) confirmed this result using changes in short-term, medium-term and long-term interest rate instruments as explanatory variables. On the other hand, Lynge and Zumwalt (1980) found that 74% and 61% of the banks in their sample have significant exposures to monthly changes in long-term and short-term debt instruments respectively. Using a pooled cross-section, time series approach, Booth and Officer (1985) found that commercial banks show extra-market sensitivity to actual, anticipated and unanticipated changes in short-term interest rates.

For our analysis, we compared the performance of our factors in rising vs falling interest rate regimes. Figure 2 indicates how we grouped our regime into falling or rising periods, based on prevailing federal funds rate. Our classification methodology results in approximately the same number of rising interest rate periods (67 months) and falling interest rate periods (68 months).

Figure 2: Interest Rate Regimes
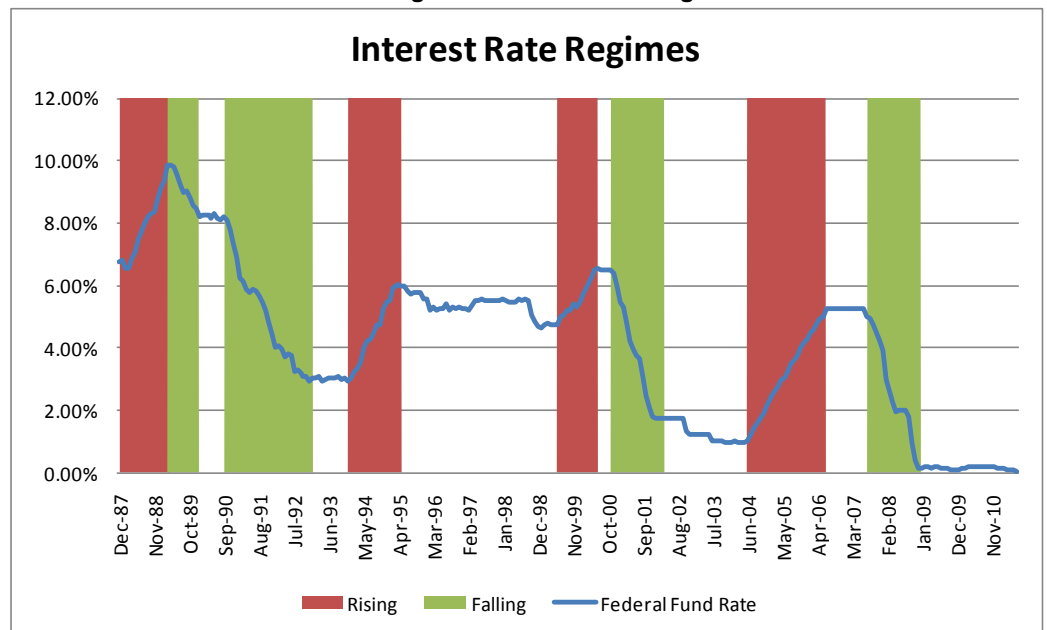
Factor performance statistics in the two regimes are detailed in Table 4 (we excluded YoYChg30DLTL as it had only a few data points in each regime).

Table 4: Bank Factors Performance Summary
In Rising / Falling Interest Rate Regimes

Factor	1M-IC		1M-Return	
	Rising Interest Rate	Falling Interest Rate	Rising Interest Rate	Falling Interest Rate
Asset Quality				
Loan Loss Indicator	0.034***	0.051***	0.43%**	1.28%**
Loan Diversity	0.020	0.036**	0.31%	0.79%*
Problem Loan Ratio	0.008	0.054**	0.05%	1.14%
NonPerAstEA	0.011	0.047*	-0.17%	0.96%
Provision Rate	-0.010	0.040*	-0.05%	0.81%
Capital Adequacy				
Loss Absorption Power	0.012	0.057**	0.13%	1.28%
Texas Ratio	0.011	0.051**	-0.12%	1.04%
Tier One Capital	-0.002	0.034	-0.06%	0.82%
Liquidity / Funding Mix				
Deposit Cost	0.007	0.032**	0.48%	0.45%
Loan Funding	0.001	0.073***	0.33%	1.50%***
Core Deposit Mix	-0.009	0.043***	0.14%	0.85%**
Profitability				
OpIncAssets	0.017	0.013	0.45%	0.27%
Cost Efficiency	-0.001	0.027	0.08%	0.59%
Valuation				
PPPP	0.074***	0.022	1.54%***	0.61%
TBVP	0.066***	0.014	1.19%***	0.45%

*** significant at 1% level; ** significant at 5% level and * significant at 10% level.

We observe an interesting pattern in factor performance across the two regimes. Valuation type ideas are the most effective in a rising interest rate environment; PPPP and TBVP are the best factors from an IC standpoint in this type of regime, and both have ICs and spreads that are significant at the 1% level. In a falling interest rate environment, factors that shine are those that measure the health of a bank's loan book (Asset Quality), capacity to absorb losses (Capital Adequacy) and stability of its funding base (Funding Mix/Liquidity). The performance of profitability factors is disappointing and not statistically significant in any regime considered.

Periods of rising interest rates are normally associated with economic growth, as the central bank attempts to head off inflation and prevent the economy from over-heating. In this environment, strategies that work are those that reflect investors' increased appetite for risk. Conversely, central banks ratchet down rates during periods of economic downturn as they try to ward off recessions and stimulate economic growth. In such periods, investors' are concerned about the impact of the economic downturn on bank profitability and depletion of capital due to degradation of loan portfolios. Accordingly, stocks that outperform during this period are those deemed "healthy" and sufficiently capitalized to weather the weak economic environment.

Loan Loss Indicator is the only signal with statistically significant IC and spread in both interest rate regimes. This factor provides an early warning signal of a possible degradation in the quality of a bank's risk assets and an indication of how profits and capital levels would be impacted in the immediate future.

2.3 High-Low Stress Periods

Next, we look at the performance of our factors in "high" or "low" stress periods. During periods of normalcy, we hypothesize that investors will ignore bank-specific attributes in favor of risk and return chasing strategies, such as momentum and valuation. However, as the industry becomes "stressed", we expect investors to fixate on those same bank-specific attributes (asset quality/loss absorption capacity etc), that they previously ignored.

Figure 4 shows the monthly number of financial institution failures, overlaid with a Bank Stress Index ("BSI"). Regular readers of our research will be familiar with the stress index, which we introduced in our November 2010 publication, "Is Your Bank Under Stress? Introducing Our Dynamic Bank Model". The BSI is a standardized measure, ranging from 0 to 1, which we used to quantify the level of stress in the banking system (See Appendix C for the list of factors in BSI). BSI starts in January 1994 due to data limitations; the closer the number is to 1, the higher the stress level in the industry. We see a gradual rise in the index from July 2007 and then a spike in February 2008, just before the collapse of Bear Stearns in March 2008. The index peaked at 0.95 in February 2009, and is recently hovering around 0.5.

The number of failed financial institutions also points to periods of elevated stress in the industry. We see a concentration of banks failures around two time frames: the late eighties/early nineties (Savings & Loans Crisis) and since the middle of 2008 (the recent financial meltdown). For our regime analysis, we used the periods December 1987 – December 1993 and July 2007 – August 2011 to define high stress periods.

Figure 4: Bank Failures and Bank Stress Index: December 1987 - August 2011
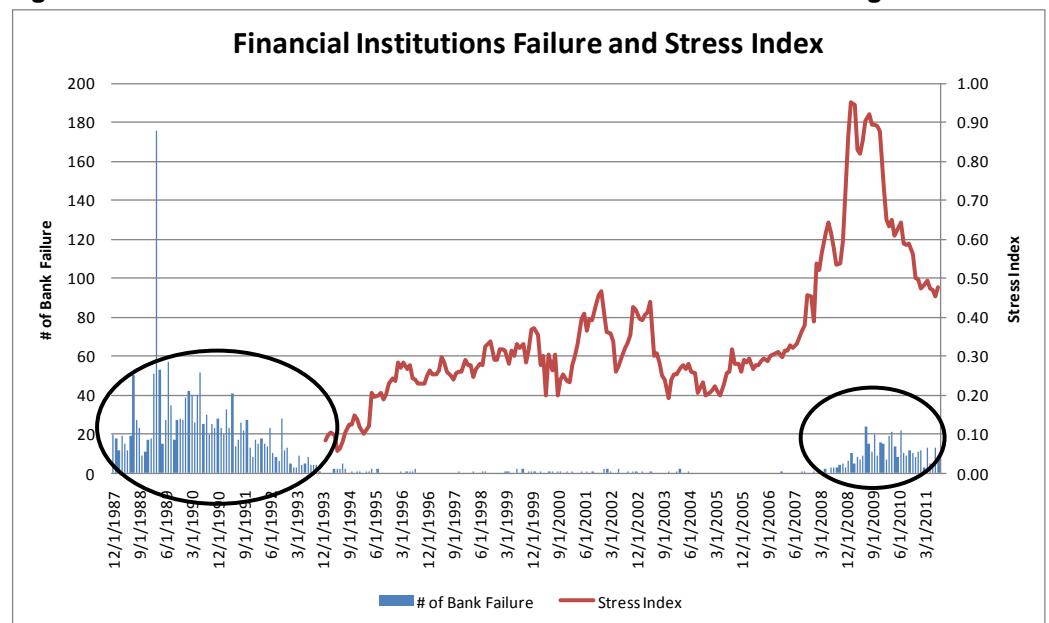
*Number of bank failures sourced from FDIC website: http://www2.fdic.gov/hsob/hsobRpt.asp

Factor results are displayed in Table 5. The pattern in Table 5 appears to mirror what we saw in the previous section; themes that measure bank "health", are superior (inferior) to "risk" chasing strategies during high (low) stress periods. However, this outperformance during periods of high stress is more pronounced than what we observed during the rising/falling interest rate regime. Every factor in the Asset Quality/Capital Adequacy/Liquidity buckets is statistically significant, with a majority being significant at the 1% level (IC basis). Seven out of the eleven factors also have return spreads that are statistically significant, compared to only four in the rising interest rate regime.

Valuation chasing strategies struggle during periods of high stress (PPPP and TBVP are the worst factors from an absolute IC standpoint), but both signals dominate the others during low stress periods. During low stress periods, the monthly return to a strategy based on PPPP (1.52%) is almost 4 times larger than that of the best strategy based off bank health, which is Loan Loss Indicator (0.40%).

Loan Loss Indicator and Tier One Capital are the only two strategies with statistically significant ICs in both high and low stress periods. Whilst the former works in the expected direction in both periods (ascending), that of the latter is as expected during high stress periods (descending), but inverted during low stress periods (ascending). This inverted performance suggests that investors are only fixated on a bank's Tier One during high stress periods, when the risk of bank failure is high, but ignore this risk metric during episodes of low stress, when bank failures are rare.

Table 5: Bank Factors Performance Summary
In High / Low Stress Regimes

Factor	1M-IC		1M-Return	
	High Stress	Low Stress	High Stress	Low Stress
Asset Quality				
Problem Loan Ratio	0.061***	0.006	1.09%	0.16%
NonPerAstEA	0.051***	0.003	0.93%*	0.06%
Loan Loss Indicator	0.049***	0.027***	1.11%**	0.40%***
Loan Diversity	0.044***	0.010	1.03%***	0.07%
Provision Rate	0.032*	0.002	0.77%	0.08%
Capital Adequacy				
Loss Absorption Power	0.064***	0.000	1.22%	0.08%
Texas Ratio	0.055***	-0.001	1.11%*	-0.01%
Tier One Capital	0.042**	-0.028**	0.88%**	-0.27%
Liquidity / Funding Mix				
Loan Funding	0.060***	0.000	1.58%***	0.13%
Core Deposit Mix	0.035***	0.000	0.85%***	0.03%
Deposit Cost	0.020*	0.020**	0.56%*	0.21%
Profitability				
Cost Efficiency	0.030**	0.007	0.75%**	-0.06%
OpIncAssets	0.018*	0.013	0.50%	0.10%
Valuation				
PPPP	0.015	0.091***	0.55%	1.52%***
TBVP	0.009	0.053***	0.43%	1.17%***

3 Risk Attribution and Factor Correlation

Rather than use all 16 factors in our attribution study, we based our analysis on the five themes we used to group our factors. Each theme composite was constructed as the equal-weighted combination of all factors in that theme. We used CIQ's US Medium Term Risk Model, which we introduced in July 2010, for risk decomposition.

3.1 Risk Attribution Using CIQ Fundamental Risk Models

The attribution analysis of the resulting five strategies (constructed as quintile 1, equal-weighted) is given in Table 6. The Value strategy is significantly more risky than the other strategies which drags down the risk adjusted return. Most of the additional risk of the Value strategy comes from relatively large market exposure as well as ill-timed earnings quality exposure and stock specific risk.

Table 6: Risk Contribution and Performance by Strategy, Quantile 1 Equal Weighted (Jan 1992 - Aug 2011)

	Contribution to Total Realized Portfolio Risk by Factor								
Strategy	Market	Earnings Quality	Value	Size	Stock Specific	Other	Total Risk	Total Return	Return/ Risk
Asset Quality	10.2%	1.8%	4.4%	7.0%	6.3%	5.3%	15.6%	13.7%	0.88
Cap Adequacy	10.1%	1.8%	4.1%	7.8%	7.0%	5.2%	16.1%	11.7%	0.73
Liquidity / Fund Mix	11.1%	1.2%	5.1%	7.6%	6.4%	6.3%	17.0%	14.2%	0.84
Profitability	13.1%	-1.8%	7.6%	5.6%	4.5%	7.3%	18.2%	10.7%	0.59
Valuation	14.6%	6.5%	8.0%	7.8%	13.4%	8.7%	25.2%	16.8%	0.67

Although all of the five strategies have very different risk model factor exposures (Table 7), they all have similar risk profiles except for the Value strategy. In all cases, the excess return (relative to the equal weighted Banks universe) comes from stock specific sources (not shown), which is to be expected as the risk model doesn't capture the bank specific factors used in the construction of the strategies.

Table 7: Selected Average Exposures, Quantile 1 Equal Weighted Jan 1992 - Aug 2011

	Active Factor Exposures*			
Strategy	Market	Earnings Quality	Value	Size
Asset Quality	-0.18	0.71	-0.34	-0.09
Capital Adequacy	-0.26	0.93	-0.40	-0.16
Liquidity / Fund Mix	-0.04	0.45	-1.81	-0.12
Profitability	0.28	-0.92	0.23	0.30
Valuation	0.01	-0.06	0.04	-0.02

*Benchmark is the Bank Universe, Equal-Weighted

Note: The exposures in Table 7 are calculated as the weighted stock exposure to the CIQ US Risk Model factors. Each stock exposure is measured as the linear coefficient of the stock return against the risk model factor return. Risk model factors returns are constructed as follows: a) the market factor is the S&P 1500 total returns, b) the style factors are the spread between the log cap. Weighted performance of the top 500 and bottom 500 stocks in the S&P 1500 ranked by fundamental factor score and aggregated for each style, c) the industry factors are the log cap-weighted performance of GICS level 2 sectors. For further information on the S&P Capital IQ Equity Risk models, please see our white papers.

3.2   Factor Correlation

The 1-month IC correlation matrix of a few of our bank specific and traditional signals are shown in Table 8 (See Appendix D for a correlation matrix with all the bank factors discussed in this paper). The factors we chose to represent "traditional" are:

- Book Value-to-Price ("BVP)" - Valuation
- Return on Assets ("ROA") – Capital Efficiency
- 1-Year EPS Growth ("ChgEPS") - Growth
- Book Leverage (BookLev), which is defined as Common Equity / Total Assets - Leverage
- Year-on-Year Change in EPS Scaled by Standard Devation of Changes Over Last 8 Quarters ("EPSStab") – Earnings Quality.
- Number of EPS FY1 Revision ("EPSNumRevFY1"). This is the number of positive revisions minus negative revisions scaled by total number of revisions – Street Sentiment.

Table 8: 1-Month IC Correlation Matrix (December 1987 to August 2011)

	Tier One Capital	Loan Diversity	Core Deposit Mix	OpIncAssets	TBVP	BVP	ROA	EPSNum RevY1	ChgEPS	EPSG	BookLev
Tier One Capital	1										
Loan Diversity	0.34	1									
Core Deposit Mix	0.19	-0.29	1								
OpIncAssets	-0.08	-0.54	0.35	1							
TBVP	-0.03	0.32	-0.41	-0.60	1						
BVP	-0.32	0.22	-0.42	-0.52	0.86	1					
ROA	0.14	-0.11	0.27	0.53	-0.69	-0.71	1				
EPSNumRevY1	0.00	-0.06	0.09	0.17	-0.39	-0.43	0.18	1			
ChgEPS	0.36	0.07	0.19	0.33	-0.61	-0.67	0.72	0.29	1		
EPSStab	0.35	0.08	0.19	0.33	-0.55	-0.65	0.47	0.39	0.75	1	
BookLev	-0.37	0.16	-0.54	-0.46	0.49	0.50	-0.48	0.02	-0.41	-0.30	1

Correlation cells greater than 0.5, or less than -0.5 are shaded in yellow. Focusing on the cells in the bottom left corner of the table (enclosed within thick border lines), we notice that bank specific factors that are least correlated with traditional factors are those that belong to our Asset Quality, Capital Adequacy or Liquidity/Funding Mix buckets. Investors looking for orthogonal factors to those in their existing models, should most likely focus on these themes for ideas and new alpha signals.

4 Data and Universe Definition

Data for this study comes directly from the various regulatory bodies that supervise financial institutions in the U.S, including the Federal Reserve and Federal Deposit Insurance Corporation. This data is collected in a uniform reporting format prescribed by the Federal Financial Institutions Examination Council, ("FFIEC"). FFIEC is an agency charged with the responsibility of setting uniform principles, standards and reports for examination of financial institutions and making recommendations to promote uniformity in the supervision of those institutions

The Federal Regulatory data is quite comprehensive in terms of breadth (number of available data items) and depth (granularity). There are approximately 1,088 quarterly FFIEC data items and pre-calculated ratios, compared to Capital IQ's 218 and Compustat's 295. We include a table of some of the data items that are unique to FFIEC in Appendix A.

Data is available for a few items in 1985, but extensive coverage is not available for a majority of FFIEC items until the late eighties/early nineties. Compared to other industry-specific data sets we have worked with, this history is quite deep and provides sufficient data points to conduct our back-tests. Although banks are required to file their reports within 40/45 calendar days for the March/June/September and December quarters respectively, we use 60/90 day lags for quarterly/annual data items in our tests. This should provide sufficient time for the reports to be collated by the respective supervisory body and made available to the general public.

The Bank Universe consists of stocks in the Russell 3000 with GICS industry group code 4010, plus several securities (See Appendix B for list) classified under Industry group code 4020 -Diversified Financials. Figure 3 (blue legend) shows the number of banks in our universe from December 1986 through August 2011. The universe count peaked at 377 securities in June 2003 and averaged 240 securities over this time period. The red legend indicates the proportion of large cap banks (defined as banks in the Russell 1000) to the total number of banks in our universe. This ratio was as high as 66% at the beginning of 1987, but currently stands at around 20%. The sharp drop in June 1991 was due to the increase in the number of bank stocks in the Russell 2000 during the annual reconstitution of the index.

Figure 3: Bank Universe Count and Proportion of Large Cap Banks to Total # of Banks
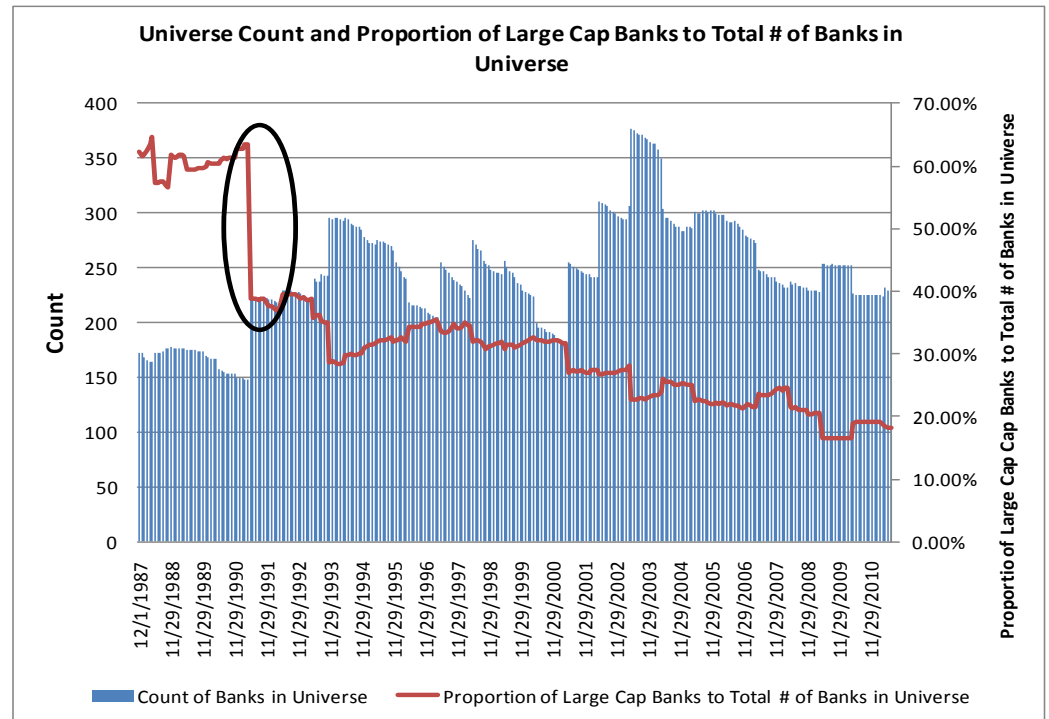
5 Conclusion

We confirm that bank specific data provided by various financial institutions regulatory bodies (FFIEC standardized data) is valuable in constructing signals that yield statistically significant long-short returns. Our tests suggest that these bank specific factors, especially those that are focused on bank health and funding mix, are uncorrelated to traditional signals and can potentially be used to enhance existing stock selection models.

Our research also supports the adoption of some form of dynamic modeling in the industry given the wide disparity in factor performance across opposing regimes. Readers of our research would be aware that we used such an approach when we released our Bank Model in November 2010.

The 16 factors discussed in this paper will be available on Alphaworks ("AW"), in the coming months, giving subscribers the advantage of the full breath of analytics available on the platform in viewing the performance of these bank signals. One exciting feature on AW is the regime monitor, which provides users with the functionality of viewing the performance of factors under 40+ pre-defined economic and market conditions. AW users also have the flexibility of viewing performance results using their own custom regime definitions.

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APPENDIX A: Unique FFIEC Data Items

FFIEC Data Items	Description from FFIEC
1-4 Family Construction Loans to Gross Loans	Sum of construction loans to developers secured by tracts of land, construction loans secured individual parcels of land, construction loans secured by single-family dwelling units, construction loans secured by duplex units and townhouses, combination land & construction loans, combination construction-permanent loans, and bridge loans all used on 1-4 family residential properties
Accounting and Auditing Expenses	Non-Interest Expenses related to any account or auditing activities
Agricultural Loans to Gross Loans	Interest and fees on domestic office loans to finance agricultural production divided by average domestic loans to finance agricultural production over gross loans
Asset-Backed Securities	Sum of the amortized cost and fair value of all asset-backed securities (other than mortgage-backed securities) collateralized by credit cards, home equity lines, automobile loans, other consumer loans, commercial and industrial loans, and others
Closed-End Loans to Gross Loans	Closed-end loans secured by 1-4 family residential properties over gross loans
Collateralized Mortgage-Backed Securities Issued or Guaranteed by FNMA, FHLMC, or GNMA	The amortized cost and fair value of all classes of CMOs, REMICs, CMO and REMIC residuals, and stripped mortgage-backed securities issued by non-U.S. Government issuers for which the collateral consists of GNMA residential pass-through securities, FNMA residential pass-through securities, FHLMC residential participation certificates, or other residential mortgage-backed securities issued or guaranteed by FNMA, FHLMC, GNMA, or VA
Interest Rate Exposures	Net gains (losses) from trading cash instruments and derivative contracts that the reporting bank holding company manages as interest rate exposures. They may arise from cash debt instruments and interest rate contracts
Loans To Foreign Governments - Non-Accrual	All loans (other than those secured by real estate), including planned and unplanned overdrafts, to governments in foreign countries. Include bankers acceptances accepted by the subsidiary banks of the reporting bank holding company and held in their portfolio when the account party is a foreign government, including such acceptances for the purpose of financing dollar exchange. Exclude acceptances that are held in trading accounts. Include loans to foreign governments, including planned and unplanned overdrafts. Exclude the following from loans to foreign governments: (1) Loans to nationalized banks and other banking institutions owned by foreign governments and not functioning as central banks, banks of issue, or development banks. (2) Loans to U.S. branches and agencies of foreign official banking institutions. (3) Loans to foreign-government-owned nonbank corporations and enterprises.
Net Noncore Funding Dependence	Sum of time deposits of $100M or more, foreign office deposits, securities sold under agreements to repurchase, insured brokered deposits issued in denominations less than $100K, and demand notes issued to the U.S. Treasury less short term investments divided by long term assets
Net Unrealized Gains on Available For Sale Securities	Report the amount of net unrealized holding gains (losses) on available-for-sale securities, net of applicable taxes. Also include any other-than-temporary impairment losses on both held-to-maturity and available-for-sale debt securities related to factors other than credit loss, net of applicable taxes
Nonfarm Nonresidential Loans to Gross Loans	Loans secured by real estate as evidenced by mortgages or other liens on nonfarm nonresidential properties, including business and industrial properties, hotels, motels, churches, hospitals, educational and charitable institutions, dormitories, clubs, lodges, association buildings, "homes" for aged persons and orphans, golf courses, recreational facilities, and similar properties. Exclude loans for nonfarm nonresidential property construction and land development purposes. All over gross loans.

APPENDIX A: Unique FFIEC Data Items (Continued)

FFIEC Data Items	Description from FFIEC
Revolving, Open-End Loans Secured by 1–4 Family - Past Due 30-89 days	The amount outstanding under revolving, open end lines of credit secured by 1 to 4 family residential properties all past due 30-89 days. These lines of credit, commonly known as home equity lines, are typically secured by a junior lien and are usually accessible by check or credit card.
Risk-Weighted Assets by Weight Category	Risk-weighted assets assigned to each of the weight categories (0%, 20%, 50% and 100%)
Time Deposits of $100,000 or more	Time certificates of deposit and open count time deposits with balances of $100,000 or more, regardless of negotiability or transferability that are held in the commercial bank subsidiaries of the reporting bank holding company. Include the following: (1) Time deposits, which are deposits with original maturities of seven days or more, that are not classified as transaction accounts and that have balances of $100,000 or more. (2) Interest paid by crediting nontransaction time deposit accounts with balances of $100,000 or more. Exclude the following: (1) All time deposits issued to deposit brokers in the form of large ($100,000 or more) certificates of deposit that have been participated out by the broker in shares of less than $100,000. (2) All time deposits with balances of less than $100,000
Total Return Swaps- Credit Derivatives - Beneficiary	Notional amount of all total return swaps where the bank is the beneficiary. A total return swap transfers the total economic performance of a reference asset, which includes all associated cash flows, as well as capital appreciation or depreciation. The protection purchaser (beneficiary) receives a floating rate of interest and any depreciation on the reference asset from the protection seller. The protection seller (guarantor) has the opposite profile. A total return swap may terminate upon a default of the reference asset.
Total Risk-Based Capital Ratio	Sum of tier 1 capital, allowable tier 2 capital, and tier 3 capital allocated for market risk less deductions for total risk-based capital all over total-risk weighted assets
Trading Revenue	Include as trading revenue: (1) Revaluation adjustments to the carrying value of cash instruments resulting from the periodic marking to market of such instruments. (2) Revaluation adjustments from the periodic marking to market of interest rate, foreign exchange rate, commodity, and equity derivative contracts and credit derivative contracts that are held for trading purposes. The effect of the periodic net settlements on derivative contracts held for trading purposes should be included as part of the revaluation adjustments from the periodic marking to market of these contracts. (3) Incidental income and expense related to the purchase and sale of assets and liabilities and off-balance-sheet derivative contracts and credit derivatives contracts that are held for trading purposes.
Unused Loan Commitments	Sum of commercial loans, credit card lines, revolving home equity lines, securities underwriting, and other unused loan commitments

APPENDIX B: List of Securities Classified as GICS Industry Group Code 4020 Added to Bank Universe

Bank of America
Bank of New York Mellon
Capital One Financial Corp
Citigroup
J.P. Morgan Chase

APPENDIX C: Factors in Bank Stress Index

The Bank Stress Index combines four indicators to measure the overall health of the banking sector. These indicators were selected to cover a range of different attributes of the banking industry.
:
- Aggregate level of loans 90-days or more delinquent (both level and change)
- Fraction of aggregate nonperforming assets that are sufficiently reserved against (both level and change)
- Trailing 3-month outperformance/underperformance of banking sector relative to the market
- Trailing 12-month assets at failed banks

The Bank Stress Index is computed by first standardizing (between 0 and 1 with an expanding window) the historical raw values of the each of the components. The index value is then set equal to the simple average of the standardized component scores where a high (low) value of the index indicates a period of high (low) stress.

APPENDIX D: Correlation Matrix of All Factors

	BF1	BF2	BF3	BF4	BF5	BF6	BF7	BF8	BF9	BF10	BF11	BF12	BF13	BF14	BF15	BF16	TF1	TF2	TF3	TF4	TF5	TF6	TF7
BF1	1.00																						
BF2	0.97	1.00																					
BF3	-0.52	-0.43	1.00																				
BF4	0.89	0.87	-0.51	1.00																			
BF5	0.26	0.28	-0.21	0.19	1.00																		
BF6	0.98	0.97	-0.41	0.88	0.24	1.00																	
BF7	0.93	0.98	-0.34	0.85	0.25	0.96	1.00																
BF8	-0.07	0.07	0.34	-0.19	0.18	-0.05	0.07	1.00															
BF9	0.78	0.73	-0.40	0.69	0.40	0.77	0.70	-0.19	1.00														
BF10	-0.45	-0.48	0.19	-0.39	-0.25	-0.41	-0.44	-0.29	-0.29	1.00													
BF11	0.33	0.42	0.07	0.18	0.37	0.34	0.42	0.64	0.20	-0.58	1.00												
BF12	0.76	0.73	-0.61	0.73	0.30	0.71	0.68	0.01	0.54	-0.67	0.43	1.00											
BF13	-0.34	-0.41	-0.08	-0.22	-0.17	-0.34	-0.37	-0.54	-0.13	0.35	-0.66	-0.29	1.00										
BF14	0.01	0.15	0.33	-0.05	0.25	0.06	0.18	0.72	-0.15	-0.18	0.56	-0.04	-0.64	1.00									
BF15	0.66	0.74	-0.03	0.59	0.15	0.72	0.76	0.32	0.45	-0.41	0.59	0.45	-0.60	0.49	1.00								
BF16	0.71	0.71	-0.51	0.69	0.21	0.69	0.69	0.04	0.54	-0.47	0.40	0.74	-0.16	0.02	0.65	1.00							
TF1	-0.09	-0.07	-0.09	-0.19	0.13	-0.10	-0.07	0.22	-0.05	-0.21	0.31	0.18	0.03	0.06	0.04	0.43	1.00						
TF2	0.77	0.80	-0.32	0.67	0.23	0.78	0.79	0.22	0.54	-0.42	0.51	0.65	-0.52	0.31	0.86	0.74	0.09	1.00					
TF3	-0.70	-0.72	0.14	-0.66	-0.08	-0.71	-0.70	-0.11	-0.44	0.27	-0.27	-0.40	0.53	-0.29	-0.69	-0.31	0.54	-0.71	1.00				
TF4	-0.23	-0.28	0.00	-0.23	-0.25	-0.28	-0.30	-0.06	-0.17	0.09	-0.19	-0.20	0.17	-0.20	-0.39	-0.33	-0.16	-0.43	0.18	1.00			
TF5	-0.67	-0.67	0.36	-0.66	-0.12	-0.66	-0.64	0.07	-0.53	0.19	-0.20	-0.36	0.33	-0.11	-0.61	-0.43	0.32	-0.67	0.72	0.29	1.00		
TF6	-0.53	-0.53	0.35	-0.47	-0.10	-0.53	-0.50	0.08	-0.43	0.19	-0.20	-0.36	0.33	-0.06	-0.55	-0.47	-0.05	-0.65	0.47	0.39	0.75	1.00	
TF7	0.68	0.68	-0.37	0.62	0.26	0.63	0.61	0.16	0.48	-0.54	0.41	0.61	-0.46	0.15	0.49	0.52	0.06	0.50	-0.48	0.02	-0.41	-0.30	1.00

BF1	Loss Absorption Power	BF9	Loan Loss Indicator	TF1	EP
BF2	Texas Ratio	BF10	Core Deposit Mix	TF2	BV
BF3	Tier One Capital	BF11	Deposit Cost	TF3	ROA
BF4	Provision Rate	BF12	Loan Funding	TF4	EPSNumRevY1
BF5	YoYChg30DLTL	BF13	OpIncAssets	TF5	ChgEPS
BF6	Problem Loan Ratio	BF14	Cost Efficiency	TF6	EPSG
BF7	NonPerAstEA	BF15	TBVP	TF7	BookLev
BF8	Loan Diversity	BF16	PPPP		

RECENT RESEARCH

September 2011: CQA Fall 2011 Conference Notes
Several of our team's members attended the Chicago Quantitative Alliance (CQA) Fall Seminar in Chicago. We present our collective notes from the conference in this report

September 2011: Research Brief – High Return Correlation and Low Return Dispersion

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.

July 2011: Introducing Research Briefs
Investors must sort through a constant stream of information in order to identify opportunities, structural changes, and market risks. Wading through information quickly and efficiently is critical as investors must understand how their strategy and exposures are impacted. Typical classes of questions include: What strategy should I use in response to a regime shift? How do I invest in a specific industry? Do other markets behave differently than the US market?

June 2011: Our Retail Industry Strategy
Does Industry Specific Data tell a Different Story? Investors are on a constant quest for new investment insights. A more complete understanding of the dynamics that shape an industry is integral to this search. As Capital IQ's Quantitative Research begins a more thorough examination of industry specific sources of alpha, we turn our attention first to the retail industry utilizing the Compustat database. Many of the strategies validate common investor best practice when looking at the retail space. In this paper we develop several new retail specific factors and use them to construct a 6-factor retail specific model. We then blend our retail model with our Value and Growth Composite Models.

May 2011: Introducing Capital IQ's Global Fundamental Equity Risk Models
Global investors invest in assets across multiple countries. In order to characterize the overall risk they need the ability to compute the total risk of their entire holdings. Using a global risk model summarizes the risk across multiple geographies into a more easily consumed single number rather than looking at the risk characteristics in isolation for separate geographies. A single global model also captures inter-country correlations so as to not miss important contagion effects.

May 2011: Topical Papers That Caught Our Interest
Favorite Papers on a Few Favorite Topics – Regime Switching and Minimum Variance
Two current topics of significant interest and frequent discussion to investors are regime switching, or a strategy's sensitivity to the current environment, and minimum variance portfolios.

April 2011: Can Dividend Policy Changes Yield Alpha?
Investors are acutely sensitive to changes in dividend policy. Literature suggests that dividend change announcements provide information about management's assessment of companies' prospects, and therefore are predictive of future stock returns. The implication for investors is worth noting. In the first quarter of 2011 alone, 105 of the 384 dividend paying S&P 500 companies (27.3%) increased their dividends, while only 1 (0.26%) decreased dividends.

In this paper, we analyze the market reaction to different types of dividend policy changes, specifically initiation, increase, decrease and suspension of dividends.

April 2011: CQA Spring 2011 Conference Notes
Several of our team's members attended the Chicago Quantitative Alliance (CQA) Spring Seminar in Las Vegas. We present our collective notes from the conference in this report.

March 2011: How Much Alpha is in Preliminary Data?
Companies often report financials twice: first, through a preliminary press release and again in their official, i.e., final, SEC filings. In theory, there should be no difference between the numbers reported in a company's preliminary financial filings and their final filings with the SEC. In practice, often significant difference can occur between the preliminary and final filings. In this month's research report, we focus on

these observed differences within the Capital IQ Point-In-Time database in order to ascertain the nature and exploitability of these differences.

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

Biotechnology is a challenging sector for investors due to the binary nature of the product cycle. Indeed many biotechnology firms' futures rest upon the success of a single product. A critical stage in the product life-cycle is the FDA approval process. In this report we look at the exploitability of a strategy centered on FDA filings.

January 2011: US Stock Selection Models Introduction

In this report, we launch our four US Stock Selection models -- Value, Growth, Quality, and Price Momentum. Built using Capital IQ's robust data and analytics, these four models are the culmination of over two years of research and development. Each model is intended to be employed as the basis for a stand-alone stock selection strategy or integrated into an existing systematic process as an overlay or new component.

January 2011: Variations on Minimum Variance

Various explanations for why risk is mispriced have been offered; the most common one is that leverage restrictions incite some investors to chase volatility at the individual issue level. In this paper, we explore various methodologies for construction of minimum variance portfolios of US listed equities and analyze the features of these portfolios.

January 2011: Interesting and Influential Papers We Read in 2010

As researchers, we spend a large amount of time trying to generate new ideas. In order to discover and refine these ideas, we find ourselves in a continuous quest for innovative and interesting articles and papers from academics, analysts, and other researchers. There is such a large body of information out there that it can be difficult to wade through all the material to find what is truly of value and interest to us. To assist in sifting through all this information, our group recently took the time to find and discuss articles that recently struck us.

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

Leveraging Capital IQ's Bank industry data, we have built a stock selection model that encompasses three themes -- Momentum, Value, and Balance Sheet Quality -- and includes a proprietary Markov-regime switching component which dynamically changes the model's weights depending on whether or not banks are in a "stressful" (or crisis) environment. This month, we will review how we built our model and its switching component.

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

In this paper, we will examine PIT data's origins, structure, variations, and proper use in implementations from Compustat and Capital IQ. Misusing PIT data, or applying it haphazardly, can discard valuable information and obscure otherwise clear signals.

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

In 2009, investors witnessed the cataclysmic failure of Price Momentum strategies. Now that accounts of this failure have been on the books for some time, it is appropriate to place the events in a historical context and further analyze the fundamental relationships that affect this strategy. We look at a number of questions from practitioners interested in the strategy. Within a historical context, how pronounced has this recent failure been? When Price Momentum fails, what is the strategy's subsequent performance? And, what factors are concurrent or predictive of the performance of Price Momentum?

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

In this paper we document the process of building and testing of our fundamental US Equity risk model across a number of short to medium term forecast horizons. The paper reviews typical risk model applications; discusses the relative merits of alternative forms of multifactor risk models; documents our data and methodology; 4 describes the chosen test metrics; and presents our results.