

## Research Brief: Airline Industry Factors

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In this brief, we examine S&P Capital IQ's industry-specific factors for the airline industry. The seven airline industry factors contained in S&P Capital IQ's Alpha Factor Library address airline profitability in terms of growth, capacity utilization, and operating efficiency and consist of industry-specific financial ratios widely used by financial analysts.

The factors can be used for qualitative analysis, as well as in industry quantitative models. Results of our regime studies show that:

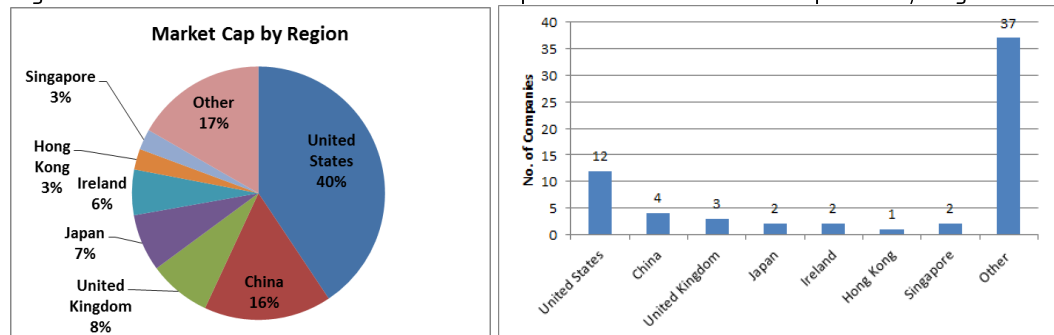
- During periods of low fuel price increases industry growth factors are most effective.
- During periods of high fuel price growth, efficiency factors stand out.
- During periods of high revenue passenger growth our studies show that both growth and fuel efficiency factors performed well.

Analysts and investors have long used industry-specific data and ratios to better understand companies in specialized areas such as banking, pharmaceuticals, and homebuilding. S&P Capital IQ's Alpha Factor Library [a web-based tool for factor analysis] now covers over 115 industry-specific alpha factors, spanning 14 different industries, and is available for download in Xpressfeed. These stock-selection factors provide practitioners with an efficient way to screen industry-specific companies, explore industry-specific signals, and integrate the signals as an overlay into existing systematic processes.

### The Global Airline Industry

As of June 2015, the global airlines BMI [Broad Market Index] contained 63 companies, from 31 different countries, truly a global industry. The total market cap of these companies was \$350 billion [U.S.], with 40% of that market cap in the U.S. and 16% in China.

Figure 1. Global Airlines BMI Index – Market Cap USD and Number of Companies by Region



Source: Capital IQ Quantamental Research. Data as of June 30, 2015.

## Airline Industry Factors

S&P Capital IQ's Alpha Factor Library contains seven specialized factors for the airline industry. The factors are built around supplemental data items from quarterly and annual reports, including revenue passengers carried, revenue passenger miles, available seat miles, fuel consumption, and average aircraft age.

Figure 2. Global Airline Factors

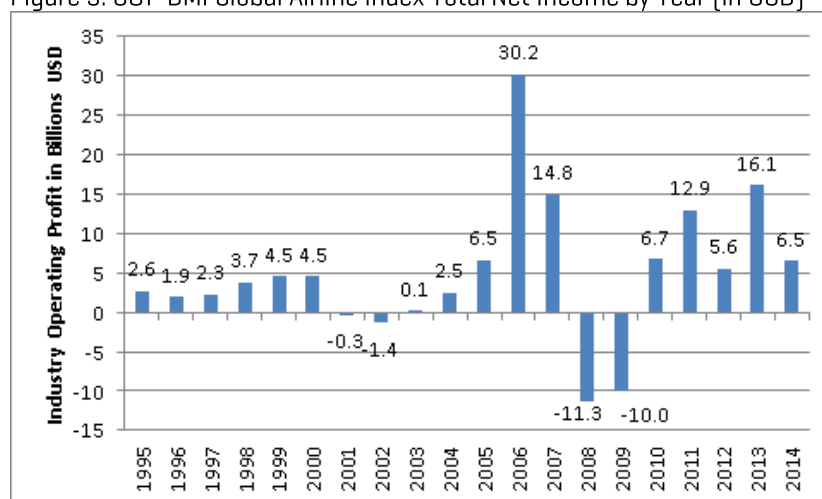
Factor Name	Factor Definition	Coverage as of June 2015	Avg Count 1999 - 2015
Total Profit per Available Seat Mile	A measure of airline profitability. Available seat miles is the total number of seats available for passenger use.	43	35.1
Operating Exp per Available Seat Mile	A measure of airline operating efficiency.	43	35.1
Passenger Load Factor	A measure of airline capacity utilization. Revenue passenger miles divided by available seat miles.	40	34.4
1 Yr Grw Revenue Passengers Carried	Growth in the number of paying passengers carried by an airline.	39	29.8
1 Yr Grw Revenue Passenger Miles	Growth in the number of miles flown by paying passengers.	39	32.9
Average Age of Aircraft	The average age of an airline's fleet, as reported by the airline.	34	23.5
Fuel Consumed per Available Seat Mile	A measure of airline fuel efficiency.	21	16.5

Source: S&P Capital IQ Quantamental Research. Data as of June 30, 2015.

## How to Interpret the Factors

A well-known investor, whose name escapes us, was once quoted as saying, "never buy anything with wings or wheels." With respect to the wings part, he appears to be correct if he was thinking about lack of stability of profits. Figure 3 shows total net income (excluding extraordinary items) for the S&P BMI Global Airlines Index. Note the extreme high profitability in 2006, followed by the crash in 2008-2009.

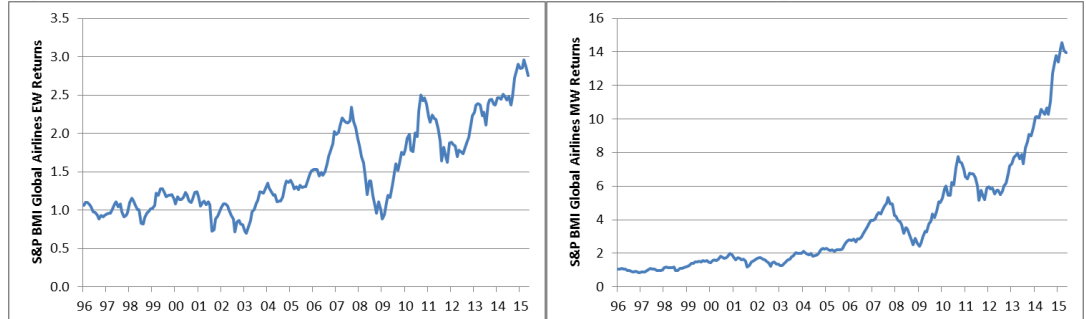
Figure 3. S&P BMI Global Airline Index Total Net Income by Year [in USD]



Source: S&P Capital IQ Quantamental Research, company reports. Data as of June 30, 2015.

Global airline stocks follow these profitability trends. Figure 3 shows the equal and market-weighted returns for the S&P BMI Global Airlines Index. Note that stocks tend to move in medium to long-term trends, with sharp ups and downs [e.g., 2003 – 2007, 2007 – 2009].

Figure 4. S&P BMI Global Airline Index Equal Weighted and Market Weighted Returns



Source: S&P Capital IQ Quantamental Research. Data as of June 30, 2015. Indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results.

**What drives airline company profitability?** One major factor, of course, is growth in business and leisure travel [cargo traffic is a lesser driver for passenger airlines]. Business fares are typically higher than leisure fares, since business travelers are much less price sensitive and tend to book flights at the last minute for higher fares.

**One-year growth in revenue passengers carried** captures overall growth in an airline's business. **One-year growth in revenue passenger miles (RPMs)** is an even more relevant metric, as it captures not only growth in enplanements [total passengers that boarded an airline's planes] but also in the average number of miles traveled per passenger, which is closely related to revenue.<sup>1</sup>

Airline capacity growth – growth in the number of airplanes and seats in service – also affects profitability. The airline industry goes through periodic cycles of high capacity addition, which eventually result in extended periods of overcapacity. **Passenger load factor** looks at revenues generated as a percentage of available seats [RPMs / available seat miles]. Thus, load factor provides an important measure of how well an airline is managing its capacity.

Another major factor for airline profitability, particularly in recent years, has been the price level of jet fuel. S&P Capital IQ airlines analyst Jim Corridore estimates that fuel expense for U.S. airlines grew at a compound annual rate of 10.7% from 2009 to 2013, and that in 2014 fuel costs accounted for about 29% of total revenues for the nation's top 10 carriers.

This means that controlling operating expenses is critical to profitability. Two industry factors look at operating efficiency: **fuel consumed per available seat mile<sup>2</sup>** and **operating expense per available seat mile**. In addition, the **average age of** [an airline's] **aircraft** tells the investor a lot about sensitivity to increases in fuel prices, as newer aircraft are significantly more fuel efficient than older models. Finally, **total operating profit per available seat mile** provides a summary measure of both growth and operating efficiency.

<sup>1</sup> Revenue passenger miles equals paying passengers carried multiplied by average miles flown.

<sup>2</sup> Available seat miles [ASMs] represent the number of seats in the active fleet multiplied by the average number of miles flown.

## How to Use the Factors

### Qualitative Analysis – Ranking the Factors

Airline industry analysts and investors use factors such as revenue passenger miles, passenger load factor, and average age of fleet when comparing airline companies and evaluating the global airline industry. Several of the industry factors relate to airline operating efficiency. These factors, shown below, provide a broad view of relative efficiency across different airlines.

Average Age of Aircraft, Fuel Consumption to ASMs, and Operating Expense per ASM are ranked in ascending order [a lower value is better than a higher value], while Passenger Load Factor and Total Profit per ASM are ranked in descending order [a higher value is better].

Note that so-called low cost carriers, such as Spirit Airlines and Ryanair, show up on top of the efficiency list. These are no-frills airlines that offer lower fares but provide fewer amenities, charging for “extras” such as food, seat allocation, and baggage. Also notable, in our view, are China’s three largest airlines, ranked either number 11 or 12 on the list, just below the low cost carriers, as a group. The big three U.S. airlines score low on overall efficiency score e.g., Delta at 18, American at 22].

Figure 5. Airline Efficiency Factors for Global Airlines<sup>1</sup>

Ticker	Company Name	Composite Ranking	Avg Age of Aircraft	Fuel Cons to ASM	Oper Exp to ASM	Passenger Load Factor	Total Profit to ASM
SAVE	SPIRIT AIRLINES INC	1	1	3	2	1	2
	RYANAIR HOLDINGS PLC	2	3	2	1	1	3
ALK	ALASKA AIR GROUP INC	3	6	4	4	2	1
RJET	REPUBLIC AIRWAYS HLDGS INC	4	4	1	1	9	3
	CONTROLADORA VUELA COMPANIA	4	1	3	2	4	8
ALGT	ALLEGiant TRAVEL CO	6	10	6	3	1	1
JBLU	JETBLUE AIRWAYS CORP	6	5	6	3	3	4
LUV	SOUTHWEST AIRLINES	8	9	5	4	5	2
SKYW	SKYWEST INC	9	8	2	2	5	9
HA	HAWAIIAN HOLDINGS INC	9	6	5	4	6	5
	AIR CHINA LTD	11	3	NM	5	7	6
	CHINA SOUTHERN AIRLINES	12	2	NM	5	8	7
	JET AIRWAYS INDIA	12	2	NM	5	5	10
	CHINA EASTERN AIRLINES CORP	12	3	NM	6	8	5
	AIR NEW ZEALAND LTD	12	7	NM	10	2	3
	AEROFLOT-RUSSIAN AIRLINES	16	4	NM	1	9	9
UAL	UNITED CONTINENTAL HLDGS INC	16	NM	8	8	3	4
	GOL LINHAS AEREAS INTELIGENT	18	5	4	3	10	7
DAL	DELTA AIR LINES INC	18	10	8	8	2	1
	LATAM AIRLINES GROUP SA	20	NM	7	6	4	7
	AIR BERLIN PLC	20	4	NM	7	3	10
AAL	AMERICAN AIRLINES GROUP INC	22	9	9	6	6	2
	INTL CONSOL AIRLINES GROUP	22	7	7	7	6	5
	CATHAY PACIFIC AIRWAYS LTD	24	6	10	9	4	6
	FINNAIR OY	25	7	NM	7	7	9
	SINGAPORE AIRLINES LTD	25	5	NM	8	9	8
	AVIANCA HOLDINGS SA	25	NM	9	9	8	4
	DEUTSCHE LUFTHANSA AG	28	8	NM	10	7	6
	SAS AB	29	8	NM	9	10	8

Source: S&P Capital IQ Alpha Factor Library. Date as of June 30, 2015.

<sup>1</sup> For convenience, we only include companies with scores on at least four of the five factors. When one factor is missing, the remaining factors are re-weighted by multiplying by 1.25.

## Tracking the Airline Cycle

We've established that fuel costs and growth in business and leisure travel are major factors in determining airline profitability. Each of these factors move in cycles and by examining these cycles we can determine which quantitative factors perform best in upcycles and which perform best in down-cycles.

We used S&P Capital IQ's Alpha Factor Library to perform regime studies on the annual percentage change in jet fuel prices and the annual percentage change in revenue passengers carried.<sup>1</sup> Results for each macro factor follow.

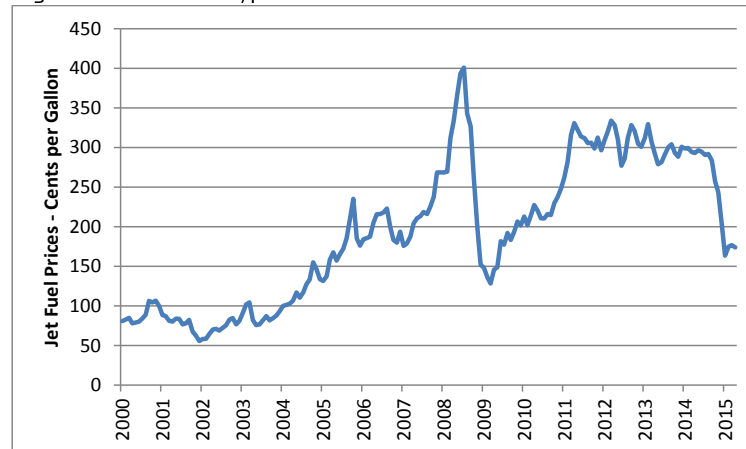
### Jet Fuel Prices

Figure 6 shows jet fuel price levels over the past 15 years. In general this period has seen rising prices; however, some periods of price increases have been sharper than others. Figure 7 shows generic and industry quantitative factors that outperform during periods of high fuel price increases [above median] and low price increases/decreases [below median].

As might be expected, **fuel per available seat mile** has significantly outperformed during periods of sharply rising fuel prices [the median year-to-year change in jet fuel prices since 2000 has been 11.8%]. **Passenger load factor** also performed well in high price change regimes, as airlines with higher load factors spread fuel costs across a greater number of paying passengers.

Less intuitively perhaps, **one year growth in revenue passenger miles** and **revenue passengers carried** show a marked difference in performance depending on the price change regime. High growth companies are favored when price changes are low, but historically underperformed when fuel prices rise.

Figure 6. Kerosene-type Jet Fuel Prices, Cents Per Gallon



Source: S&P Capital IQ Quantamental Research, U.S. Department of Energy. Data from January 2000 to April 2015.

<sup>1</sup> Results use the S&P BMI Global Airlines Index as the universe.

Figure 7. Select Factor Performance from Jet Fuel Price Growth Regime Study (Jan '00 - Apr '15)

High Price Change Regime		Low Price Change Regime	
Generic Factors	% Q1 Mthly Excess Return	Generic Factors	% Q1 Mthly Excess Return
Earnings Quality	0.89	Num FY1 EPS Rev	1.07
Net Income Stability	0.89	SUE	1.04
Industry Factors	% Q1 Mthly Excess Return	Industry Factors	% Q1 Mthly Excess Return
Airln: Fuel/Avail Seat Mile	0.67	Airln: Fuel/Avail Seat Mile	0.08
Airln: Pssngr Load Factor	0.64	Airln: Pssngr Load Factor	0.10
Airln: 1Y Gr RevPassMiles	-0.40	Airln: 1Y Gr RevPassMiles	1.41
Airln: 1Y Gr RevPassCarry	-0.59	Airln: 1Y Gr RevPassCarry	1.49

Source: S&P Capital IQ Alpha Factor Library. Data from January 2000 to April 2015.

Excess returns are defined as returns above or below the equal-weighted S&P Global Airlines benchmark.

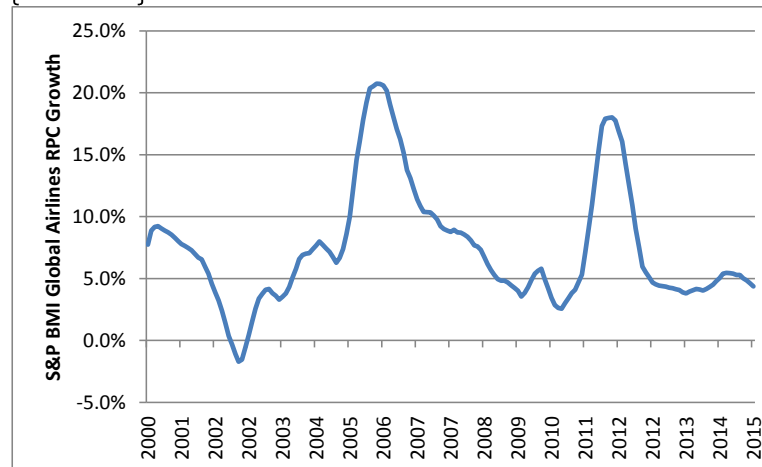
### Revenue Passengers Carried

The revenue passenger growth cycle since 2000 is shown in Figure 8. Over this period, when revenue passenger growth is high [above the median] earnings estimate revision factors have tended to outperform.

In addition, a variety of industry factors outperform during periods of high revenue passenger growth: **1-year growth in revenue passengers carried, fuel/available seat mile, and average age of aircraft**. Note that this combination of industry factors includes both growth [RPCs] and efficiency factors. As previously mentioned, average age of aircraft relates to fuel efficiency since a newer fleet of aircraft is more fuel efficient.

During periods of low passenger growth two generic factors that work are EBITDA to enterprise value [a valuation factor] and 1-year change in EPS [growth]. Airline industry factors do not tend to work during low passenger growth regimes.

Figure 8. Revenue Passenger Growth Percent Change for S&P BMI Global Airlines Index [Smoothed]



Source: S&P Capital IQ Quantamental Research, company reports. Data from January 2000 to June 2015.

Figure 9. Top Factors from Revenue Passenger Growth Regime Study (Jan '00 to Jun '15)

High Passenger Growth Regime		Low Passenger Growth Regime	
Generic Factors	% Q1 Mthly Excess Return	Generic Factors	% Q1 Mthly Excess Return
Analyst Diffusion	1.84	Analyst Diffusion	0.84
EBITDA / EV	0.20	EBITDA / EV	0.81
1Y Chg EPS	-0.04	1Y Chg EPS	0.61
Industry Factors	% Q1 Mthly Excess Return	Industry Factors	% Q1 Mthly Excess Return
Airln: 1Y Gr RevPassCarry	1.11	Airln: 1Y Gr RevPassCarry	-0.07
Airln: Fuel/AvailSeatMile	1.07	Airln: Fuel/AvailSeatMile	-0.29
Airln: Avg Aircraft Age	0.45	Airln: Avg Aircraft Age	-0.41

Source: S&P Capital IQ Alpha Factor Library. Data from January 2000 to June 2015.

Excess returns are defined as returns above or below the equal-weighted S&P Global Airlines benchmark.

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## Our Recent Research

### August 2015: [Point-In-Time vs. Lagged Fundamentals – This time if\[t'\]s different?](#)

The common starting point for alpha discovery and risk analysis is the backtesting of historical company financials using a research database. Whether internally constructed or licensed, research databases can be distinguished by two primary formats – Point in Time and Non-Point in Time. This paper focuses on the major practical differences between Point in Time (PIT) and Non-Point in Time (Non PIT) data for both backtesting and historical research. PIT data is defined by its ability to answer two questions: When was the information known? and What information was known at the time?.

### August 2015: [S&P Capital IQ's Stock Selection Model for the Japanese Market](#)

Since the launch S&P Capital IQ's four U.S. stock selection models ["US Stock Selection Models Introduction"] in January 2011, we released a suite of global stock selection models targeting both developed ["Introducing S&P Capital IQ Global Stock Selection Models for Developed Markets"] and emerging markets ["Obtaining an Edge in Emerging Markets"]. In this report, we introduce a stock selection model for the Japanese equity market that completes our global model offering.

### July 2015: [Research Brief – Liquidity Fragility](#)

As liquidity in the bond market becomes increasingly constrained, there has been a growing chorus of concerns raised by Mohamed A. El-Erian, John Paulson, Jamie Dimon, Larry Summers and recently the Federal Reserve. As we learned in the Global Financial Crisis, when liquidity seizes in one market, margin calls are met by raising cash in one of the most liquid markets in the world: the US equity market. How should equity investors be thinking about liquidity in their market?

### June 2015: [Equity Market Pulse – Quarterly Equity Market Insights Issue 4](#)

The Q2 issue of Equity Market Pulse features a spotlight on developed Europe, which has the highest estimated growth rates and most attractive valuations among developed markets.

### May 2015: [Investing in a World with Increasing Investor Activism](#)

Investor activism has gained mainstream acceptance as activists with larger-than-life personas have waged a string of successful campaigns. Activist hedge funds' assets under management (AUM) have swelled to \$120 billion, an increase of \$30 billion in 2014 alone. It was among the best performing hedge fund strategies in 2014 as well as over the last three- and five-year periods. In this report, we explore an investment strategy that looks to ride the momentum surrounding the announcement of investor activism. We further explore what, if any, changes to targeted companies activists are able to influence.

### April 2015: [Drilling for Alpha in the Oil and Gas Industry – Insights from Industry Specific Data & Company Financials](#)

During the recent slide in oil prices, clients frequently asked us which strategies have historically been effective in selecting stocks in declining energy markets. This report answers this question, along with its corollary: which strategies work in rising energy markets? We also explore the value of oil & gas reserve data used by fundamental analysts/investors, but not used in a majority of systematic investment strategies. The analysis in this report should help both fundamental and quantitatively-oriented investors determine how to best use industry-specific and generic investment metrics when selecting securities from a pool of global oil & gas companies.



**March 2015:** [Equity Market Pulse – Quarterly Equity Market Insights Issue 3](#)

Driven by proprietary data and analytics from S&P Capital IQ™, Equity Market Pulse provides professional investors with insights into global equity market fundamentals and performance at a glance. Spanning developed and emerging markets in the Americas, Europe, and Asia, it provides perspective on fundamentals, valuations and investment strategy effectiveness.

**February 2015:** [U.S. Stock Selection Model Performance Review – The most effective investment strategies in 2014](#)

Since the launch of the four S&P Capital IQ™ U.S. stock selection models in January 2011, the performance of all four models [Growth Benchmark Model, Value Benchmark Model, Quality Model, and Price Momentum Model] has been positive and 2014 was no exception. Our models' key differentiators – distinct formulation for large cap and small cap stocks, special treatment for the financial sector, sector neutrality to target stock specific alpha, and factor diversity – enabled the models to outperform across various market environments. In this report, we review the underlying drivers of each model's performance over the 12 months ended December 31, 2014, document performance from January 2011 when the models went live, and provide full model performance history from January 1987.

**January 2015:** [Global Pension Plans: Are Fully Funded Plans a Relic of the Past?](#)

In this brief we leverage S&P Capital IQ's extensive collection of pension data to examine:

- Companies with the strongest and weakest pension funding status globally.
- Global trends in pension funding and accounting.
- Companies with the most aggressive versus conservative pension accounting assumptions.
- Underfunded plans with the least and most three-year improvement in funding.

**January 2015:** [Profitability: Growth-Like Strategy, Value-Like Returns](#)

Value-based strategies have been the favorite weapons in many investors' arsenals, historically yielding large returns and consistently outperforming. Most value investors focus on the price side of the equation – i.e., buying assets that are priced below their intrinsic values. Yet, there's another dimension to the value equation that has been complementary to value and just as critical in generating excess returns. Enter profitability. Profitability has historically worked as an investment strategy because instead of focusing on the cheapness of an asset it focuses on the productiveness of an asset – i.e., its ability to generate earnings for the investor. Our results from January 1996 to August 2014 show: The S&P 500® continues to be the preeminent regional performer in terms of both financial results and price appreciation. Risk and Return: Tracks the dynamics of equity market returns and volatility.

**November 2014:** [Equity Market Pulse – Quarterly Equity Market Insights Issue 2](#)

Driven by S&P Capital IQ's™ proprietary data and analytics, Equity Market Pulse provides professional investors with insights into global equity market fundamentals and performance at a glance. Spanning developed and emerging markets in the Americas, Europe, and Asia, it provides perspective on valuations, operating efficiency, and investment strategy effectiveness.

**October 2014:** [Lenders Lead, Owners Follow – The Relationship between Credit Indicators and Equity Returns](#)

This paper demonstrates a strong link exists between credit events and equity returns, suggesting a potential investment strategy. Whereas previous academic work focused on ratings changes

within the U.S., this analysis takes a global perspective and includes the post-financial crisis period. Shareholders should note that even in a benign credit environment Standard & Poor's Ratings Services ["S&P Ratings Services"] downgraded 68 U.S. speculative grade companies in the second quarter of 2014, and forecasts the rate of speculative grade defaults to increase next year to 2.2% from 1.6% in 2014. Year to date, there have been 303 instances where credit default swap spreads have widened by more than 50 basis points.

**August 2014: [Equity Market Pulse – Quarterly Equity Market Insights Issue 1](#)**

Equity Market Pulse provides professional investors with insights into global equity market fundamentals and performance at a glance. Spanning developed and emerging markets in the Americas, Europe, and Asia, it provides perspective on valuations, operating efficiency, and investment strategy effectiveness. The content of the Equity Market Pulse is driven by S&P Capital IQ's fundamental data and analytics including S&P Capital IQ Estimates, Global Point-in-Time Fundamentals, and the Alpha Factor Library. The analysis is broken into four themes:

**July 2014: [Factor Insight: Reducing the Downside of a Trend Following Strategy](#)**

In this report, we review an approach that reduces the downside risk of a trend following strategy. This new signal first separates a stock's return into its systematic and stock-specific components, and then picks stocks solely on the latter. We compare the performance of this new signal (alpha momentum) to a typical trend following strategy (total momentum) and report the following:

**May 2014: [Introducing S&P Capital IQ's Fundamental China A-Share Equity Risk Model](#)**

Factor risk models play an important role in equity portfolio management. Portfolio managers depend upon factor risk models to obtain portfolio risk prediction and risk attribution against a group of largely orthogonal factors each with meaningful econometric explanations. S&P Capital IQ is dedicated to providing a broad set of high-quality models and products to the global asset management community. Since 2010, we have released a series of single country risk models as well as global and regional equity risk models. We are now releasing single country risk model covering China A-Shares equities.

**April 2014: [Riding the Coattails of Activist Investors Yields Short and Long Term Outperformance](#)**

On August 13, 2013, Apple's stock price rose 4.75% on high volume after Carl Icahn, a renowned activist investor, tweeted that his firm had accumulated a large position in the company. In the ensuing 6 months, the stock rose an additional 9.33% as Icahn demanded that the company add another \$50 billion to its existing stock buyback plan. Icahn backed off from this demand on February 10, 2014, but not before Apple's stock price had risen to \$528.99 from \$461.88 where it was before he embarked on the campaign. By then, the company had already aggressively repurchased its stock, including \$14 billion in a two-week stretch. As high-profile campaigns have occurred with greater frequency and resulted in more successes, the AUM for investor activist funds has tripled to \$95 billion in 2013, 3 times the amount in 2008.

**March 2014: [Insights from Academic Literature: Corporate Character, Trading Insights, & New Data Sources](#)**

February 2014: [Obtaining an Edge in Emerging Markets](#)

February 2014: [U.S Stock Selection Model Performance Review](#)

January 2014: [Buying Outperformance: Do share repurchase announcements lead to higher returns?](#)

October 2013: [Informative Insider Trading – The Hidden Profits in Corporate Insider Filings](#)

September 2013: [Beggar Thy Neighbor – Research Brief: Exploring Pension Plans](#)

August 2013: [Introducing S&P Capital IQ Global Stock Selection Models for Developed Markets: The Foundations of Outperformance](#)

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October 2010: [Getting the Most from Point-in-Time Data](#)

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