PGIM QUANTITATIVE SOLUTIONS

Information Momentum Refined: Less Volatility, More Diversification

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To learn more about our capabilities, please contact PGIM Quantitative Solutions by email at contactus@pgim.com or by phone in the US at +1 (866) 748-0643 or in the UK at +44 (0) 20-7663-3400.

To offset the underperformance of value stocks, which has persisted for some time, and to smooth out the returns to our portfolios, we have attempted to strengthen our factor models. In particular, we have refined our growth-related factor category. We believe this will reduce volatility and provide greater diversification[1] benefits versus the Value factor.

To do this, we moved beyond the conventional means of measuring information momentum, which is among the factors in our growth category. We believe that by expanding the information set to include data that extends beyond what is normally supplied and/or interpreted by sell-side analysts, we have created a refined Information Momentum factor that is 1) more robust, 2) less volatile and 3) more predictive than conventional growth and price momentum factors.

[1] Diversification does not protect against a loss in a particular market; however, it allows you to spread that risk across various asset classes.

A Richer Information Set

Typically, information momentum is normally measured by earnings revisions and price target revisions as well as information and sentiment gleaned from earnings conference calls. In addition, conventional indicators of information momentum are typically focused on short-term events. But the incomplete explanatory power of all these indicators suggests that something else lies behind stock price performance that has not been fully measured.

At PGIM Quantitative Solutions, we believe a fuller explanation for stock performance may lie in a richer set of information, information found outside of conference calls and sell-side analysts' interpretations of revisions to earnings and price targets. By extending beyond earnings-related information, near-term fundamentals and measures that rely on sell-side analysts, this refined Information Momentum factor has improved our growth factor category, enabling it to provide better diversification benefits versus the Value factor.

To begin, we distinguish "information" from "news." While information relates to fundamentals that produce durable effects on stock prices, "news" produces price movements that are transitory. To create a more refined Information Momentum factor, we collected not only conventional analyst information (earnings estimates, revisions, target prices), but also a wide range of non-earnings data, including industry-specific metrics and data such as product launches, which have longer-term implications.

A Wider Net: Examples of Data Captured by PGIM Quantitative Solutions Information Momentum Factor

Additional offerings	Bankruptcy filings	Trademarks, Copyrights, Patents
Adverse drug events	Reorganization plans	Joint Ventures
Buyback reductions, eliminations, guidance	CEO, CFO Changes	Spinoffs
New buyback programs	Store, plant closings	New products, product recalls
Dividend guidance	Data Breaches	Drug pricing
Dividend cuts, suspensions, eliminations, increases	Government contract awards	HY Corporate bond new issues
Special dividends	Job cuts, firings, layoffs	IG Corporate bond new issues
Clinical trial results	Restructuring, Turnaround	Drug pipeline, patents, patent expirations
Project delays, loss	Licensing agreement	Same-store sales
Store, plant openings	Litigation	Strikes and pay disputes
	Contract or order losses and wins	Supply disruptions

Constructing the Signal

To construct our new Information Momentum factor, over a given time frame we specified certain days as "information days" in which an information event or shock occurred, and we captured the market's reaction. To gauge this reaction, we measured a stock's performance on days around the information event. We did this recognizing that information may leak prior to an event and the market's reaction may occur on days after. We then took returns that occurred during the information day windows and aggregated them over the given time frame giving us a simple measure of the market's reaction to many different information types across all sectors.

But this methodology raised a question in the minds of some investors. If this measure already reflects the market's reaction to new information, can it be exploited? Doesn't it mean the market has already reacted to the new information, eliminating the opportunity?

Two characteristics of information events make it possible to exploit them. First, behavioral finance has shown that markets don't always react completely to new information. While the reaction may be immediate, it is not always complete. So, investors are able to take advantage of the remaining price movement.

Second, information is often autocorrelated. That is, good information often begets more good information. The same is true for bad information. Thus, investors who respond early may benefit later as prices react to additional information released later.

Information Momentum Captures What Price Momentum and Growth Miss

To assess whether our Information Momentum factor truly captures an effect that differs from Price Momentum, we compared monthly scores on the Information Momentum factor with those a Price Momentum factor. We conducted this comparison on the Russell 1000® and Russell 2000® Indexes, and we obtained similar results on both.

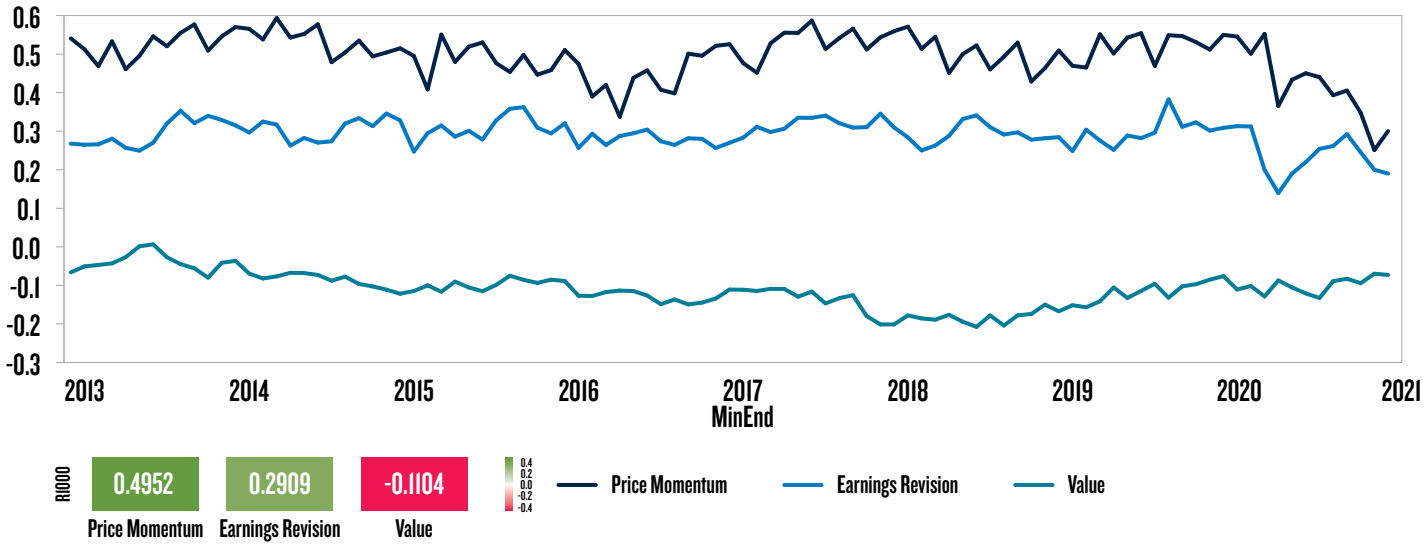
For the Russell 1000, the Information Momentum factor is correlated with Price Momentum at nearly 50% (0.4952), though that fluctuates somewhat over time. Although high, this was expected because Price Momentum reflects information events as well as news events. That the correlation is not even higher indicates that Information Momentum is capturing an effect that differs from that of Price Momentum. We believe it's capturing price movement that results only from fundamentals-based information.

It is interesting that the chart below shows that this correlation declined sharply in 2020. Not surprisingly, this reflects the effect of the pandemic on stock prices, which overwhelmed the effect of company-specific information.

We also compared Information Momentum to various other growth factors. As the chart shows, Information Momentum is correlated less strongly with the Earnings Revisions factor, at 0.29. Again, this was expected because Information Momentum reflects both earnings and non-earnings information.

More importantly, the Information Factor is negatively correlated with our Value factor (-0.1104). This reinforces the idea that the Information Factor is capturing the effect of fundamentals-based information. The correlation between Price Momentum and Value is more negative (-0.19). This is expected because with Price Momentum, a stock price can be driven by investor sentiment, untethered from fundamentals. That the relationship between Information Momentum and Value is not more negative suggests that this factor is picking up the effect of fundamentals. But the fact that it is negative also indicates that it provides diversification benefits.

Information Momentum Is Correlated with Other Growth Factors but Provides Diversification Benefits



Date range: 1/1/2012 to 12/31/2020.
Source: PGIM Quantitative Solutions
Shown for illustrative purposes only. Please see 'Notes to Disclosure' page for important information including risk factors and disclosures.

Information Momentum Outperforms on Volatility, Drawdowns, Turnover

To compare the performance of the Information Momentum, Price Momentum and Earnings Revision factors, we divided the universes (Russell 1000, Russell 2000) into quintiles each month over the period from 2013 to 2020, putting stocks with the highest scores on Information Momentum into the top quintile and those with the lowest scores into the lowest quintile. We then constructed a long/short portfolio, with the top quintile being "Buys" and the bottom quintile being "Sells." Returns were equal-weighted, and a spread return was calculated by subtracting the return to the lowest quintile from the return to the highest quintile.

The nearby chart shows that for the Russell 1000, the average spread return was only slightly higher for Information Momentum (0.23%) than for Price Momentum (0.20%). In fact, for the Russell 2000, Price Momentum (0.41%) significantly outperformed Information Momentum (0.25%).

In both universes, however, the volatility and maximum drawdowns were much smaller for the Information Momentum portfolio. In the Russell 1000, the standard deviation was just 2.45% versus 5.12%. Similarly, the maximum drawdown was just -13.22% versus -29.24%. Again, this is not unexpected. Stock prices driven by Price Momentum include those rising or falling due to investor sentiment, not just fundamentals-based information. Price performance due to fundamentals-based information, on the other hand, should be less volatile.

Information Momentum: Less Volatile, Less Turnover

Returns, Volatility, Drawdown, Turnover (2013 – 2020)

R1000	Average Spread of Return	Standard Deviation of Spread Return	Max Drawdown	Average Turnover
Price Momentum	0.20%	5.12%	-29.24%	22.73%
Information Momentum	0.23%	2.45%	-13.22%	18.14%
Earnings Revision	0.26%	2.12%	-13.15%	51.95%

R2000	Average Spread of Return	Standard Deviation of Spread Return	Max Drawdown	Average Turnover
Price Momentum	0.41%	4.94%	-30.19%	23.03%
Information Momentum	0.25%	2.71%	-19.55%	16.78%
Earnings Revision	0.26%	2.08%	-12.06%	54.57%

Source: Bloomberg, Refinitiv, Russell, PGIM Quantitative Solutions. For illustrative purposes only.

Similarly, in the Information Momentum portfolio, turnover was also much less. For the Russell 1000, while long/short spread returns were stronger for the Earnings Revision factor, and the volatility was less, the holdings in this portfolio changed by an average more than 51% every month. In contrast, with Information Momentum, the portfolio changed by just a little more than 18% per month. For the Russell 2000, the results were even more dramatic. This low turnover indicates that with Information Momentum, portfolio holdings that are attractive are more likely to remain attractive.

Information Momentum: A Clean, Stable Signal

To assess the quality of the signal coming from our refined Information Momentum factor, we looked at returns to each quintile. We excluded returns in 2020 because of the influence of the pandemic on returns, noted earlier.

Looking at the quintile returns reveals the stability of the Information Momentum signal. Monthly returns increase monotonically across the quintiles. That is, the returns increase steadily from low to high from the quintile scoring lowest on Information Momentum to the quintile scoring the highest.

In contrast, with Price Momentum, returns across the quintiles are uneven. While the lowest quintile generates the lowest return, the highest return (14.65 bps) comes in the middle quintile and the second-lowest return comes in the fourth quintile, indicating a significant amount of noise in the signal.

The Earnings Revisions factors perform much like our refined Information Momentum factor, but as we noted above, those portfolios involve much higher levels of turnover.

Returns Increase as Information Momentum Increases

R1000 – Quintile Returns Excluding 2020					
Factor	Q1	Q2	Q3	Q4	Q5
Price Momentum	-26.29	-0.10	14.65	-1.36	13.73
Information Momentum	-15.08	-6.85	-0.83	6.58	16.99
Earnings Revision	-13.05	-5.53	-4.57	0.84	21.81

Date range: 1/1/2012 to 12/31/2020
Source: Bloomberg, Refinitiv, Russell, PGIM Quantitative Solutions. For illustrative purposes only.

The Information Momentum Signal Is More Predictive Over the Long Term

While Price Momentum can signal future returns, it may not be as predictive over the long term because it reflects the transitory effects of investor sentiment. On the other hand, because our refined Information Momentum factor is based on fundamentals, it appears to be somewhat more predictive of future returns.

The chart below shows that for the Russell 1000, returns that are attributable to Information Momentum are stronger over subsequent months than those attributable to Price Momentum. In addition, they persist somewhat longer, reaching to Month 8 versus Month 7 for Price Momentum. Returns attributable to Earnings Revisions also decay more rapidly in subsequent months than those attributable to Information Momentum. Results for the Russell 2000 were similar, with subsequent monthly returns being strongest for the Information Momentum factor.

Information Momentum Signals Drive Returns for Several Months

R1000												
	0	1	2	3	4	5	6	7	8	9	10	11
Price Momentum	0.20%	0.12%	0.03%	0.06%	-0.02%	0.08%	0.10%	0.10%	-0.06%	0.00%	0.02%	0.08%
Information Momentum	0.23%	0.20%	0.10%	0.14%	0.04%	0.00%	-0.01%	0.05%	0.02%	-0.10%	-0.03%	0.04%
Earnings Revision	0.26%	0.02%	0.01%	0.09%	-0.01%	0.06%	0.08%	0.10%	0.11%	0.12%	0.10%	-0.02%

Date range: 1/1/2012 to 12/31/2020
Source: Bloomberg, Refinitiv, Russell, PGIM Quantitative Solutions. For illustrative purposes only.

Conclusion

Our research shows that an Information Momentum factor that casts a wider net and goes beyond what is normally supplied by and interpreted by sell-side analysts can be a more robust, more stable and more powerful predictor of stock prices than other growth factors.

Further refinement is possible, however. For example, the predictive power varies somewhat by sector. Although the number of data items is roughly equal across sectors, adding more industry-specific metrics may improve the signal.

Because our Information Momentum factor is based on information related to fundamentals, it exhibits less volatility and more predictive power than Price Momentum. It also requires less portfolio turnover than a portfolio based on an Earnings Revision factor. We believe our refined Information Momentum factor will translate into better performance and diversification benefits, providing smoother returns when the Value factor is underperforming.

PURSUIT OF OUTPERFORMANCE

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