



PGIM QUANTITATIVE SOLUTIONS

REFINING THE GROWTH FACTOR: CAN “LOCALIZING” ANALYST INSIGHTS ENHANCE PERFORMANCE?

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At PGIM Quantitative Solutions, we believe fundamentals are the most reliable driver of stock prices. Consequently, we construct factors to capture fundamental insights that can inform about future stock performance. Our fundamental factors fall into three categories — value, growth and quality. When constructing these factors, we are always looking for ways to differentiate their construction or refine their measurement.

To illustrate, think of one growth factor — analyst revisions — which we think of as an information momentum signal (Information Momentum Refined: Less Volatility, More Diversification). Analyst revisions reflect the changes analysts make to their forecasts when they have processed newly available information.

We could refine this factor in various ways. We could evaluate differences in diffusion signals versus rate of change signals.¹ We could also vary the look-back period for revision, weight each analyst differently and so forth.

However, another question pertains to which analyst estimates are used to construct the factor. Common sources for sell-side analyst insights are IBES, FactSet, Bloomberg and Standard & Poor's. But these analysts, who may be influenced by certain issues (e.g., corporate access), are neither complete nor always the best processors of new information. One alternative has been to use “crowd-sourced” estimates, which come from independent groups not subject to these pressures.

Another option is to use insights from “local” analysts — those based in, and specific to, the countries in which their covered companies are domiciled. We distinguish them from “global” analysts from major brokers.

These local analysts can access different information, may be better-informed and better able to process the implications of new corporate developments. We believe “localizing” analyst insights can meaningfully enhance our growth factors.

¹ Diffusion signals give an indication of the direction of the change in analyst estimates but not the magnitude. Rate of change signals capture the magnitude of the change.

Local Analysts Add Breadth, Depth and Frequency of Revisions

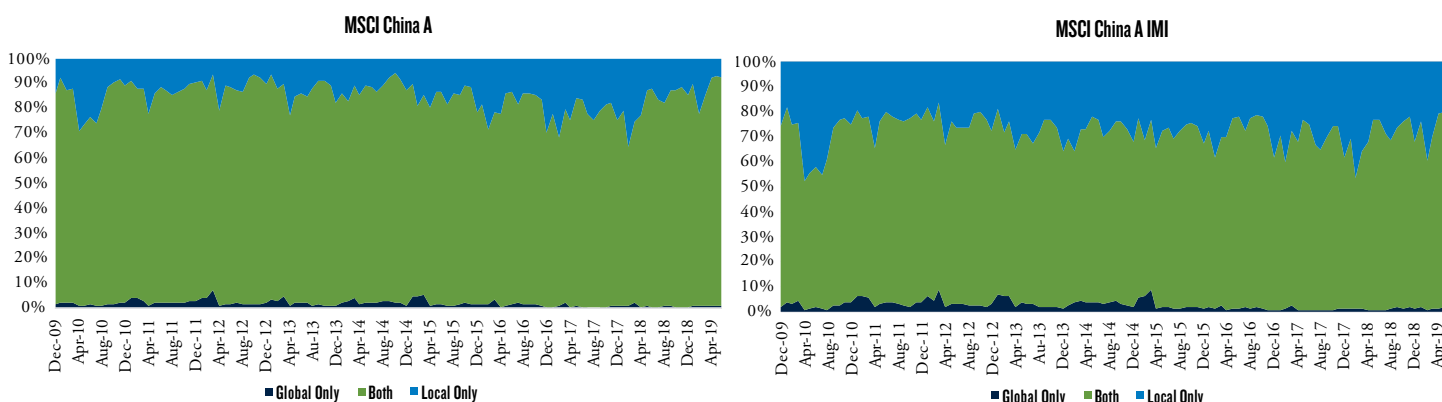
To test this proposition, we looked at the China A-share market, the hottest local market in the world. By local market, we mean companies that are focused on the local economy of China rather than the global economy.

We started by looking at coverage by local analysts versus global analysts over the period from 2009 through 2019. We did so by looking at the MSCI China A and MSCI China A IMI universes.²

Looking at monthly earnings per share (EPS) estimates, we determined whether a stock was covered by global analysts only, local analysts only or by both. Coverage was determined by provision of an EPS FY1 estimate.

We found that, on average, 1.6–2.2% of stocks in the MSCI China A and IMI universes are covered only by global analysts. In contrast, between 70–82% of stocks are covered by both global and local analysts — a solid overlap. The portion of stocks that are covered only by local analysts ranges from 15% in MSCI China A and 27% in China A IMI. So, local analysts add significantly to the breadth of coverage.

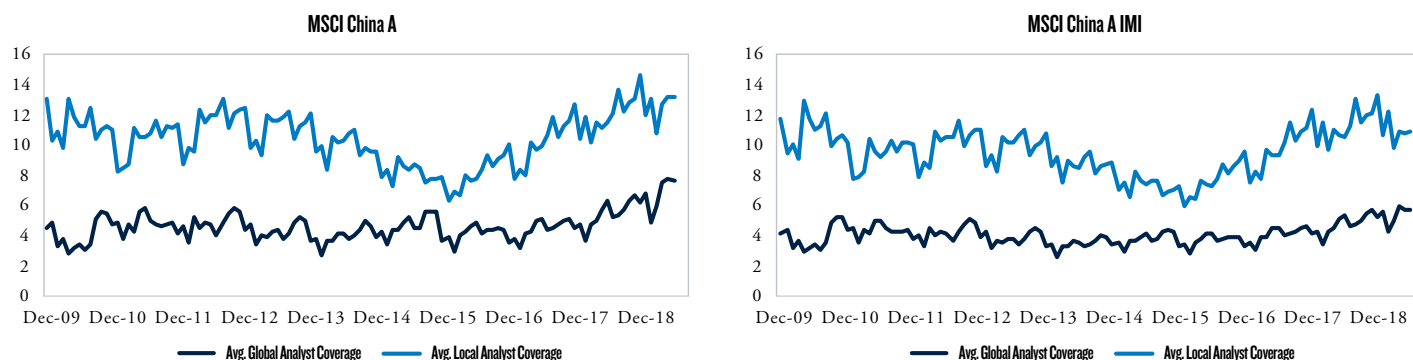
Figure 1. Local Analysts Add Noticeably to Breadth of Coverage



Sources: WIND, IBES, MSCI, Datastream and PGIM Quantitative Solutions. Time period: December 2009 – June 2019.

In addition to improved breadth, local analysts provide greater depth. The chart below shows that, on average, each stock in the MSCI China A universe is covered by 10.4 local analysts but only 4.6 global analysts. In the MSCI China A IMI universe, those figures are 8.3 versus 3.5. While improved depth can be viewed as increased attention, we view it as also helping to reduce noise in estimates in a somewhat opaque investment universe.

Figure 2. Local Analysts Provide Greater Depth of Coverage

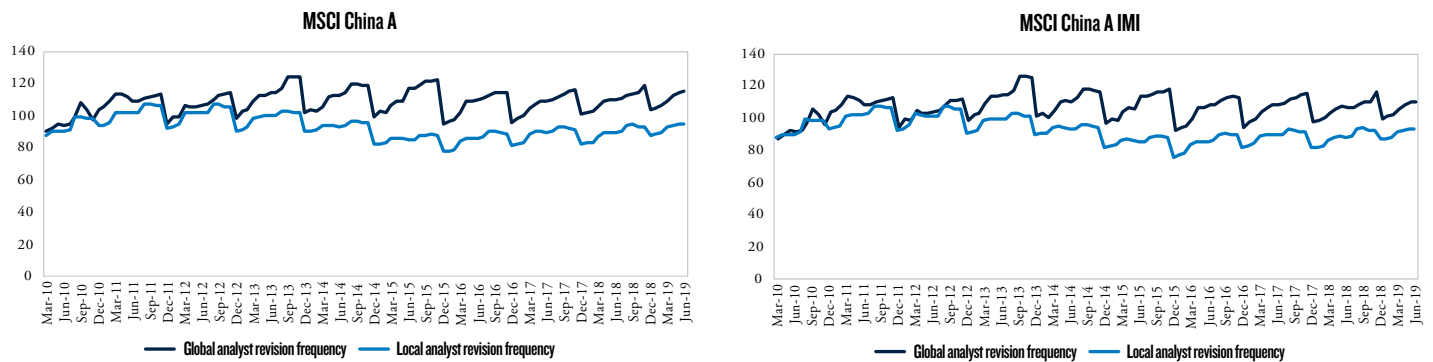


Sources: WIND, IBES, MSCI, Datastream and PGIM Quantitative Solutions. Time period: December 2009 – June 2019.

Another important dimension of local analyst insights is the access to information. If local analysts are better connected to the information flow, we would expect more frequent estimate revisions to reflect their new insights. The charts below show that local analysts' revisions are indeed more frequent. In the MSCI China A universe, they make revisions every 93.3 days versus every 107.5 days for global analysts. In the MSCI China A IMI universe, local revisions occur every 92.9 days and global revisions occur every 108.6 days.

² China A shares have historically been available only to residents of mainland China. The MSCI China A Index includes only large-cap stocks. The MSCI China A IMI Index includes both large caps and small caps. China H shares trade on the Hong Kong exchange and have historically been available to foreign investors.

Figure 3. Local Analysts Offer More Frequent EPS Revisions



Sources: WIND, IBES, MSCI, Datastream and PGIM Quantitative Solutions. Time period: March 2010 – June 2019.

Local Analyst Coverage Offers an Information Advantage

Does greater breadth and depth of coverage and frequency of revisions translate into a real information advantage for investors? We constructed two EPS estimate revision factors, one using only global estimates and one using only local analyst estimates, and we tested them across the MSCI China A and IMI universes.

The results are clear. For both universes, information coefficients,³ spread returns and information ratios for the local analyst factor are superior to those for the global analyst factor. In both universes, the information coefficient exceeds that of the global analyst factor, indicating local analyst estimate revisions had a stronger correlation with the cross-section of future stock returns. Similarly, the spread return confirmed that the insights of local analysts were more associated with companies that would outperform in the future. Even after adjusting for the volatility of spread returns via the information ratio, the insights from local analysts continue to demonstrate their superiority.⁴

Figure 4. Local Analysts Provide an Advantage in China

MSCI China A				MSCI China A IMI			
Factor	IC	Spread Return	Spread IR	Factor	IC	Spread Return	Spread IR
Local	4.30%	13.90%	2.1	Local	3.80%	11.60%	2.2
Global	3.30%	10.60%	1.5	Global	3.30%	10.00%	1.8

Sources: WIND, IBES, MSCI, Datastream and PGIM Quantitative Solutions. Time period: October 2010 – June 2019.

China H Shares: With More Global Visibility, Does Local Information Still Matter?

China A shares represent only a small portion of China exposure in emerging market indexes. China H-share companies, on the other hand, are more visible and available to global investors. Does local analyst coverage offer a similar informational edge for these stocks as well?

As we did with the China A share and IMI universes, we examined the performance of a local and global estimate revision factor on China H-share stocks in MSCI Emerging Markets indexes. The result is very interesting. The chart below shows the cumulative performance of separate local and global EPS estimate revision factors.

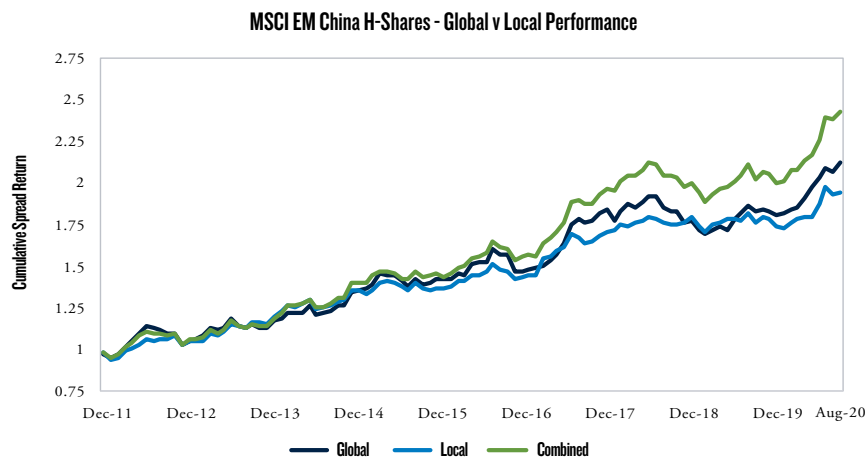
On average, the two estimate revisions factors performed similarly. However, combining the global and local insights together provided a superior outcome. This benefit is most apparent from approximately 2017 onwards.

This is not surprising. Over this timeframe we have seen significant issues, such as the US-China trade conflict and the COVID-19 crisis. These issues have had both global and local implications. We believe the global and local analysts are each better placed to better evaluate the global and local effects of each issue. The combination of insights therefore proves to be complimentary.

³The information coefficient is a correlation between factor values and one-month forward stock returns.

⁴We segmented the universe into quintiles, based on their factor scores. The spread return is the difference in the returns between the top-scoring and bottom-scoring quintiles. Similarly, the spread IR is the difference in the information ratios between the top-scoring and bottom-scoring quintiles. The IR is a measure of risk-adjusted returns versus a benchmark, which is used to measure manager skill.

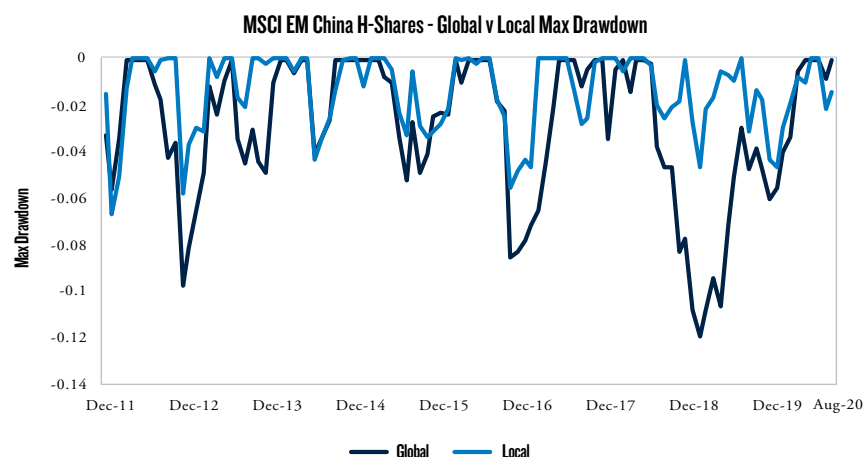
Figure 5. Local and Global Insights Combined Provide an Advantage



Sources: WIND, IBES, MSCI, Datastream and PGIM Quantitative Solutions. Time period: December 2011 – August 2020. Past performance is not a guarantee or reliable indicator of future results

The chart below shows the drawdown profile of the global and local analyst estimate revision factors. It is clear, particularly in the last five years, that local analysts have been better able to adapt to changes in the macro/market environment. We believe that with the possibility of increased local regulatory shocks (e.g., education providers in China), local insights will continue to be valuable.

Figure 6. Recently, Local Analyst Insights Have Helped Limit Drawdowns



Sources: WIND, IBES, MSCI, Datastream and PGIM Quantitative Solutions. Time period: December 2011 – August 2020.

Local Insights Provide an Advantage in Developed Markets

We believed that local insights are also important in markets beyond China and the emerging world. To test this, we analyzed local and global analyst coverage in Japan. Among developed markets, Japan is distinct in terms of the ability of investors to access corporate meetings, investor relations, etc. This proves to be a limitation on the information flow to analysts and on the overall coverage of the Japanese market.

Toyo Keizai, Inc. is a highly respected news media publishing company in Japan. It provides earnings and sales forecasts based on independent analyst research. Forecasts provided by Toyo Keizai analysts are generally accepted as the standard source for analysts' forecasts in the Japanese securities market (Mande, 1996).

Academic studies have found these earnings forecasts to be more accurate than those from IBES. Among the research findings regarding Toyo Keizai estimates:

- **Access:** Toyo Keizai has access to management information that typically would not be available to US analysts (Conroy, R. M., Harris, R. S., & Park, Y. S., 1994).
- **Accuracy:** Forecasts from sell-side analysts (IBES) are more optimistic and less accurate than estimates from an information provider, Toyo Keizai (Conroy, R. M., & Harris, R. S., 1995).
- **Optimism:** Toyo Keizai forecasts are more conservative than management's, while sell-side analysts' forecasts are more optimistic than management's (Kondo & Ota, 2010).
- **Timeliness:** When Toyo Keizai forecasts become public, the IBES mean estimate still contains old estimates that are subsequently revised in later months. It is plausible to assume that, in fact, many analysts use the Toyo Keizai forecasts as part of the information they incorporate into their revisions (Conroy, R. M., Harris, R. S., & Park, Y. S., 1994).

Our research looked at the efficacy of a simple estimate revision factor using these local insights versus typical sell-side sources. For both large-cap and small-cap Japan stocks in the MSCI EAFE universes, information coefficients, spread returns and Information ratios are superior for the Toyo Keizai revision factor.

While the advantage of the Toyo Keizai revision factor is present in large caps, it is even more evident in small caps. Spread returns between 2004 and 2021 were 8.26% with local estimates versus just 2.53% with global estimates. For the period between 2016 and 2021, the figures are 6.87% and -1.40%.

Figure 7. Local Insights Provide an Advantage in Developed Markets, Especially in Small Caps

MSCI EAFE (Japan) - 2004 to 2021				MSCI EAFE SC (Japan) - 2004 to 2021			
Factor	IC	Spread Return	Spread IR	Factor	IC	Spread Return	Spread IR
Toyo Keizai	2.79%	4.80%	0.88	Toyo Keizai	3.74%	8.26%	1.37
IBES	2.03%	3.39%	0.44	IBES	2.44%	2.53%	0.37

MSCI EAFE (Japan) - 2016 to 2021				MSCI EAFE SC (Japan) - 2016 to 2021			
Factor	IC	Spread Return	Spread IR	Factor	IC	Spread Return	Spread IR
Toyo Keizai	3.23%	7.33%	1.43	Toyo Keizai	2.26%	6.87%	1.49
IBES	2.60%	4.24%	0.53	IBES	-1.37%	-1.40%	-0.21

Sources: Toyo Keizai, IBES, MSCI, Datastream and PGIM Quantitative Solutions. Time period: December 2003 – May 2021.

Improving the Implementation of Our Philosophy

At PGIM Quantitative Solutions, we believe in the role of fundamentals and the long-term reliability of value, growth and quality factors. This research has improved on the implementation of this philosophy by refining one of our growth factors, analyst revisions.

Opportunities exist for further refining. For example, many sources of locally generated information exist, including analyst insights in other countries (where sufficient breadth exists) and natural language processing sources specific to certain countries (e.g., Google search versus Baidu).

Other opportunities to refine fundamental inputs are present within market sectors. Sector- or industry-specific metrics are one possibility. In the energy sector, for example, metrics such as the ratio of enterprise value to proved and probable reserves could be incorporated into a value, growth or quality factor.

This sharpening of a model's fundamental inputs is a natural evolution in quantitative investing, and we believe this ongoing improvement will enhance the ability of our strategies to generate attractive returns and navigate changing market conditions in the future.

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