PGIM QUANTITATIVE SOLUTIONS

A Unified Framework for Investing in Emerging Markets

May 2021

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ABOUT PGIM QUANTITATIVE SOLUTIONS

PGIM Quantitative Solutions began managing multi-asset portfolios for institutional investors in 1975. Today, we manage systematic quantitative equity and global multi-asset strategies as part of PGIM, the global investment management businesses of Prudential Financial, Inc. (PFI). Our investment processes, based on academic, economic and behavioral foundations, serve a global client base with $118.8 billion in assets under management as of 3/31/2021.

FOR MORE INFORMATION

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.

Emerging Markets - Diverse Return & Risk Drivers

Emerging markets (EM) are an alluring section of the global equity markets. While access to EM has improved, market inefficiencies persist. Access to reliable company information and data, while improving, still trails the developed world. For information that is available, liquidity and trading limitations can introduce challenges for its exploitation. This contributes to ongoing investment opportunities for skilled active investors. Another dimension which adds to the appeal of emerging markets are the opportunities across different countries and industries, which can vary significantly. Effectively, there are multiple sources of significant return that can be pursued, spanning securities, industries and countries.

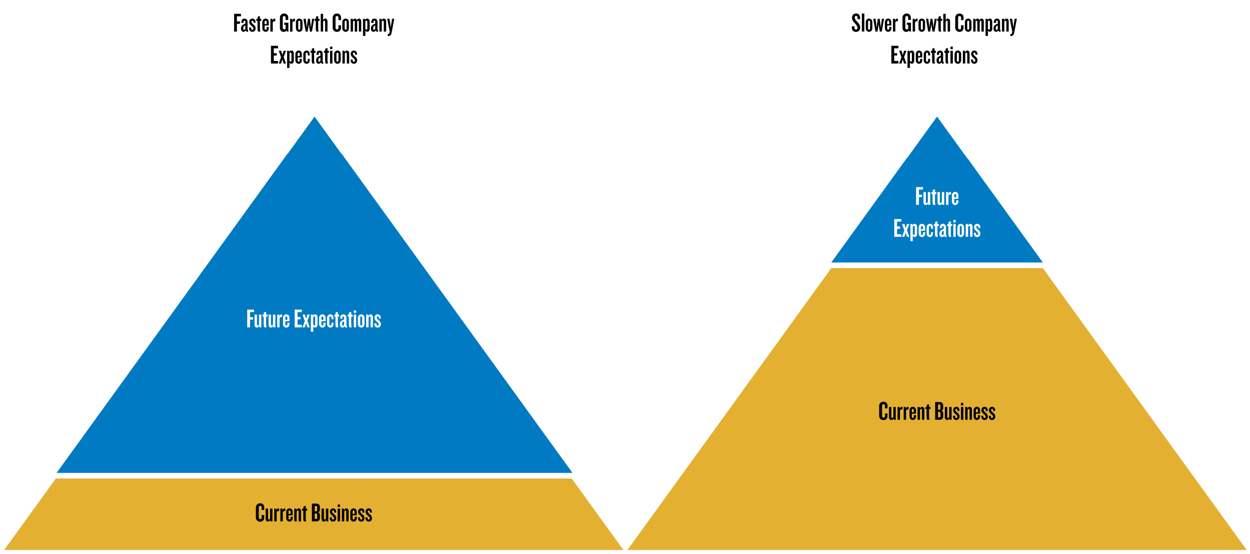
However, the capture of this alpha is by no means trivial. Multiple sources of risk exist which can degrade return potential. For individual companies, bankruptcy, fraud, and significant financial loss are events with higher likelihoods in emerging markets. Trading halts and bad data also prove headaches for quantitative oriented investors. Compounding these stock level risks are various macro level issues - currency crises, war or conflict, trade disputes; political elections; oil shocks – all of which can yield dramatic market outcomes.

At PGIM Quantitative Solutions, we've carefully designed a framework that allows us to capture alpha opportunities across securities, industries and countries, while balancing against adverse risk outcomes.

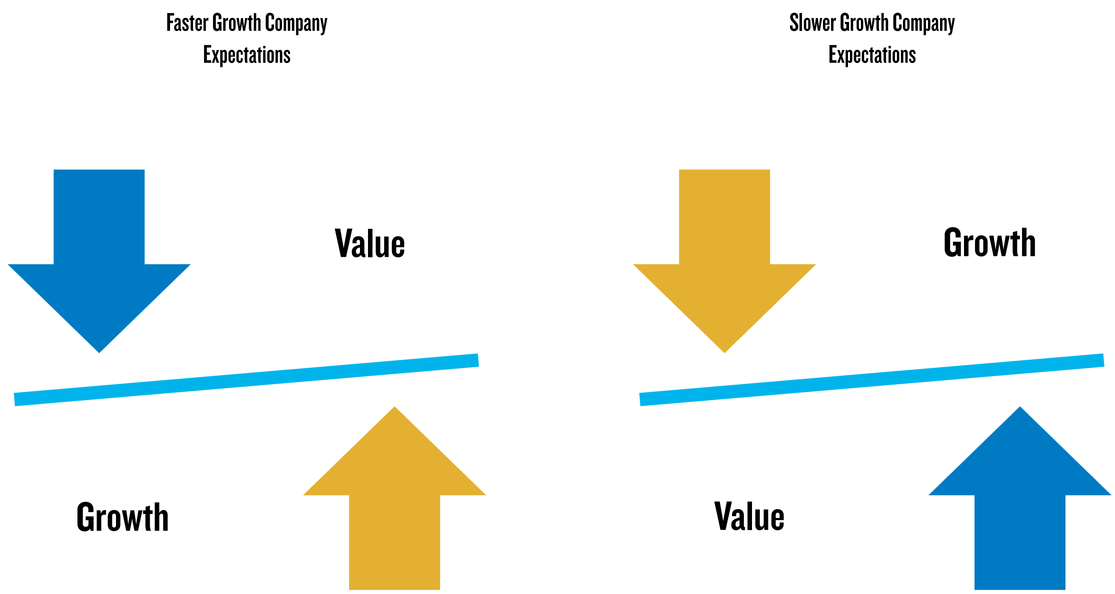
Adapting to Company Fundamentals

The starting point for PGIM Quantitative Solutions framework is to recognize that fundamentals matter. Prices don't always reflect those fundamentals throughout time, however, thus opening up investment opportunities. As markets move, different fundamentals become more significant measures for different types of companies. Consequently, we have found that different types of signals will be more effective at detecting those mispricings. The challenge is to determine which fundamentals are the most important for which types of companies. We turn to valuation theory to guide us in this task.

The value of a company is made up of two parts: the value of its existing operations and expectations about its future growth prospects. To demonstrate how this helps us select the most important information for specific company types, consider two companies: one slow growth and one fast growth.



Source: PGIM Quantitative Solutions. For illustrative purposes only.



Source: PGIM Quantitative Solutions. For illustrative purposes only.

For a slow-growth company, expectations about future growth prospects play a minor role in valuing the firm, as slower-growth companies have limited growth prospects. The value of the firm is driven by earnings generated from existing operations. Investors are sensitive to the price they pay for an earnings stream. Consequently, valuation-oriented signals are more effective at evaluating the future performance prospects of slower-growth companies.

For a faster-growth company, expectations about future growth prospects are the main driver of valuation. We focus on information that gives us insights into future growth prospects. As a result, we find that growth signals are more effective at evaluating the future performance prospects of fast-growth companies. This framework allows for a more refined evaluation of each stock. It helps increase the likelihood that we are evaluating a stock's performance potential through the correct lens. It allows us to unify both value and growth stock selection approaches within a single stock selection model, which produces a balanced core portfolio.

Adaptive stock selections models are especially important for investing in emerging markets, where growth rates by country, sector, and security have changed dramatically over the last decade. PGIM Quantitative Solutions research and investment experience have shown that this adaptive bottom-up stock selection framework is essential to capturing inefficiencies within equities, and to driving consistent performance over the long term.

Introducing Top-Down Dynamics

Within emerging markets, a top-down investment approach can complement bottom-up stock selection. In fact, a major allure of EM has long been the return opportunities arising between countries and industries. The opportunities created by this dispersion can be significant.

In recent years, top-down effects have had more pronounced influences on market behavior. Recent examples are being seen in the impact of the 2019 China/US trade war and the COVID-19 crisis, which brought about cascading consequences on countries and industries.

To reflect this changing dynamic, PGIM Quantitative Solutions recently introduced a top-down element to our investing framework. Advances in modeling techniques have also increased our confidence that top-down opportunities can be a source of added return rather than risk.

In the past, we have been skeptical about the effectiveness of top-down investment approaches. A common approach to modeling top-down dynamics utilized separate country and industry selection models. Such models suffer from a lack of breadth. Currently, there are 27 countries in the MSCI Emerging Markets Index, with representation from 24 industry groups. This lack of breadth results in highly concentrated active views. In such a framework, any incorrect views can prove particularly painful to portfolio performance.

A second issue that had previously limited the effectiveness of top-down approaches is inefficient allocation of capital. In this case, a country selection model could identify China as a desirable country based on attractive valuations and strong growth. However, not all industries within China have the same attractive value and growth attributes. A naïve country selection model would allocate to all industries within China, rather than to specific opportunities within China. Such inefficient allocation of capital further weakens the return potential from separate country and industry top-down models.

Last, a challenge with using separate country and industry models for top-down investing is the method of combining insights into a single signal. Which is more heavily weighted: country or industry insights? Does the importance of these insights vary through time?

Top-Down Framework

A unified approach of incorporating global and local dynamics

A country is a collection of local industries

	Industry	Consumer Services	Materials	Banks	Insurance	Software & Services	Media	Utilities
Country	**P/E**	24.5x	13.9x	**10.0x**	14.3x	33.3x	23.8x	17.8x
China	19.8x							
Taiwan	16.2x							
Korea	15.1x							
India	10.7x							
Brazil	**13.2x**	**50.5x**	**9.6x**	7.7x	**10.7x**	**20.5x**	**22.5x**	**10.1x**
South Africa	16.1x							
Russia	7.4x							

Build forecasting models at the country/industry level:

- Consistent framework for both country AND industry decisions
- Increased breadth and opportunity at the top-down level
- Efficient use of capital with targeted top-down allocations

Source: PGIM Quantitative Solutions. P/E data is not actual and is based on example data. For illustrative purposes only.

To counter these challenges, PGIM Quantitative Solutions leveraged a more refined, direct approach. We model top-down insights at the combined country-industry group level. By taking this approach, we generate a much broader set of top-down insights, affording us diversification across our investment bets. We can then access insights across a maximum of 648 country-industry groups (=27 countries x 24 industry groups).[1] This approach further allows us to more efficiently target attractive opportunities. If Software & Services, for example, was the most attractive industry group within China, we could effectively target those companies.

Modeling at the country-industry group level also helps us avoid having to combine separate country and industry group models. Our approach unifies country and industry top-down approaches, while increasing the viability of exploiting return dispersion between countries and industries.

Next, we need to evaluate the attractiveness of each country-industry group. To accomplish this task, we stay true to our philosophy and focus on fundamentals, utilizing valuation and growth-related insights. Encouragingly, while valuation insights are typically more useful for country insights, and growth for industry insights, both value and growth insights are effective at the country-industry group level!

Incorporating explicit top-down insights also reduces noise-to-signal issues. We construct fundamental inputs along sector dimensions, measuring valuation insights differently across these sectors. We find that earnings and dividends are effective fundamentals for valuation ratios within Utilities, whereas sales inputs are more effective in Information Technology. Therefore, through the introduction of explicit top-down factors, our unified framework provides consistent insights across all country-industry dimensions. This adds to our confidence that top-down insights will translate into viable sources of return.

[1] In practice we require a certain number of stocks within a country-industry group, or a certain index weight representation for a country-industry view to be computed. Diversification does not protect against a loss in a particular market; however, it allows you to spread that risk across various asset classes.

Putting It All Together

Within our overall investment approach, we maintain the belief that bottom-up stock selection is of primary importance in exploiting inefficiencies within EM equities and in driving consistent performance over the long term. So as we introduce top-down insights into our alpha model we maintain a dominant weight towards bottom-up insights.We also expect that as we extend the implementation of top-down insights across our global strategies, the weight assigned will vary. This is intuitive as developed markets are more integrated, with certain regions even exhibiting greater homogeneity (e.g. Europe).

Top-down insights, however, help diversify the return drivers utilized within our alpha model. We now have more uncorrelated factors to provide an offset when one factor category is out of favor. Indeed, that benefit has been born out by our analysis. In recent years, bottom-up fundamental factor insights have been challenged globally, not just within emerging markets. However, analysis that integrated top-down insights show a significantly reduced performance drawdown over this same time period. Improved diversification of return drivers used in the model, plus the fact that macro drivers such as COVID-19 had an unusually large impact on recent markets means that top-down insights were that much more effective. This benefit was reinforced by our International Equity Opportunities strategy in 2020. This higher active risk-strategy has a strong focus on top-down considerations. In 2020, bottom-up valuation factors were challenged for well-documented reasons. Yet our top-down valuation insights were positive contributors to performance for that strategy.

In the longer term, regardless of the macro environment, we expect the added diversification of top-down insights to be beneficial. We find that noisy stock-level data, particularly in emerging markets, can be improved by the incorporation of top-down insights (which benefit from reduced noise in aggregation). The resulting signal-to-noise dynamic of our alpha signals is therefore improved. To illustrate this point, a stock in a country-industry group could look highly undesirable, resulting in an underweight position. However, the overall country-industry segment could look more attractive. The incorporation of top-down insights would temper the size of our underweight position.

As we blend top-down insights with our bottom-up stock selection model, we recognize that implementation is still key to success. The most consistent way to deliver alpha in emerging markets is within a well-diversified, style-pure portfolio with risk controls. Our portfolios maintain strict limits on security active exposures, and controls on industry and country exposures. The final portfolios have a high level of diversification. These controls are calibrated to balance alpha opportunities with protection against adverse security, industry and country outcomes.

We believe this enhancement positions our emerging markets strategies to better navigate even more varied market conditions in the future.

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PURSUIT OF OUTPERFORMANCE