Q4 2017

EQUITY MARKET STRESS MONITOR

A Perspective on the Current Stability of Global Equity Markets

The Intech Equity Market Stress Monitor is a collection of five metrics we believe are reliable indicators of equity market stress based on Intech's 30-year history of studying volatility. You can use the monitor to gain insight to market risk regimes, contextualize beta risk management and complement your conventional risk metrics.

Executive Summary

- Intech's risk measures of volatility point to increasing signs of suppressed global-equity risk that intensify the likelihood of a large negative shock in equity markets when volatility levels increase in the future.
- Today, the way forward is likely asymmetric: the likelihood of a tail event is greater than it used to be, but the probability of incremental gains of a smaller magnitude are the likely outcome. This implies that investors should prepare for the less likely but more significant move lower in equity markets.
- Non-U.S. developed equity markets, in particular European equity markets, appear to have the risk measures at the most extreme levels, whereas emerging markets appears to have the lowest level of market strain.
- Over the past year, Intech observed across markets a substantial decrease in correlation of returns and increase in index efficiency. This would seem to imply that there is a higher likelihood for active management to outperform with similar levels of risk as equity markets.
- Intech also observed that dispersion of returns across stocks as well as the correlation of returns across equity markets are at substantially low levels. It seems that the idiosyncratic component of stock returns is explaining more of the returns between stocks while the overall magnitude of excess return dispersion across stocks is extremely low.

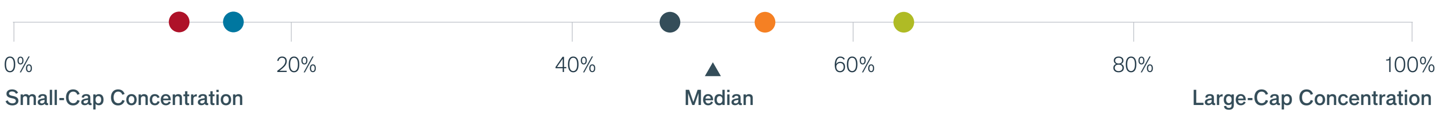
Janus Henderson
INVESTORS

Intech Equity Market Stress Monitor Data as of 12/31/2017

Intech identified a collection of risk metrics that we believe are reliable indicators of equity market stress. For each of these metrics, Intech's observations have shown that when markets deviate substantially from typical levels, they eventually return to it. Moreover, the greater the deviation and persistency of extreme values across a larger collection of metrics, the more likely it is that the return to the mean will be abrupt, and accompanied by substantial volatility.

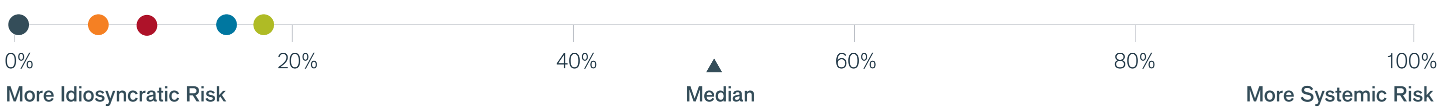
Capital Concentration

Do winners take all? Capital concentration measures how the capital is distributed among stocks within an index. An increase means that more capital is allocated to larger-cap stocks. A decrease indicates that capital is moving to smaller-cap stocks. Intech's research has shown that the capital distribution among stocks is remarkably stable over the long term and tends to revert to median levels.



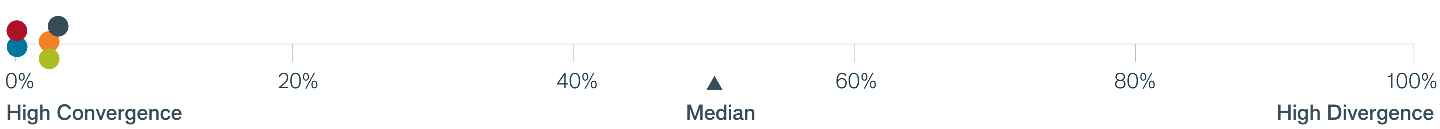
Correlation of Returns

How similar are stocks' absolute returns? Correlation measures the market-weighted average pair-wise correlation of stocks in the index. It quantifies the similarity of stocks' returns, as a fraction of their volatility. As correlations rise, stocks' returns tends to move in tandem with each other as the common component of return – the market – begins to dominate. As correlations decline, stocks' returns exhibit less similarity between stocks because idiosyncratic factors dominate the market component.



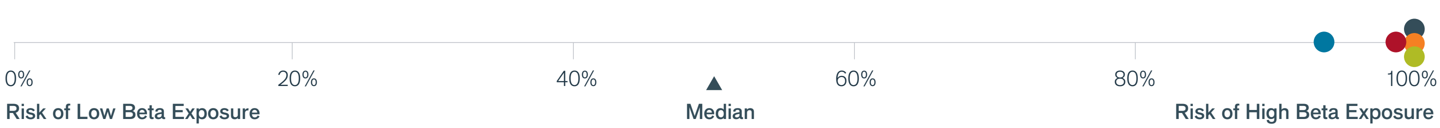
Dispersion of Returns

How different are stocks' relative returns? Also known as cross-sectional volatility, dispersion measures whether stocks' returns relative to their benchmark are converging (low dispersion) or diverging (high dispersion). As dispersion increases, underlying stock or portfolio returns begin to diverge from the overall benchmark. Intech finds that the market eventually reverts to long-term levels when return dispersion is substantially low or high, which is associated with strain on the market.



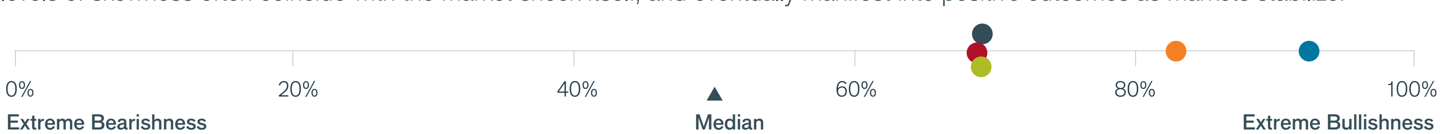
Index Efficiency

How much beta risk should you take? Index efficiency measures the level of index diversification versus the potential diversification available given the volatility characteristics of index constituents. Low market efficiency makes it possible for a skilled manager to achieve above-market outcomes with lower beta exposure, but the risk is lower upside capture potential. Conversely, high index efficiency means that reliably outperforming the index requires a manager to have similar beta risk, exposing a portfolio to higher downside capture.



Skewness of Returns

How fat are the tails? Skewness measures the asymmetry of index returns around the mean. Logarithmic returns tend to exhibit a left-skewed distribution, meaning the most extreme returns are below the mean, as investors tend to react more strongly to negative news. When there is irrational exuberance among investors, market returns tend to become less negatively or, even, positively skewed. Conversely, low levels of skewness often coincide with the market shock itself, and eventually manifest into positive outcomes as markets stabilize.



MSCI World | MSCI EAFE | S&P 500 | MSCI Europe | MSCI Emerging Markets

Regional Insight by Index

Global Equity Market – MSCI World Index

- Global developed equity markets continue to demonstrate some strain, with three indicators significantly deviating from normal ranges since the beginning of the year.
- Specifically, Intech observes that dispersion of returns, correlation of returns and index efficiency are reaching extreme levels when measured on the MSCI World Index while concentration of capital is moving closer to historical average levels.
- The last time that the index efficiency and dispersion of returns indicators were both at similar extremes in global developed equity markets was in 2007-08, prior to the global financial crisis period.

Non-U.S. Developed Equity Market – MSCI Eafe Index

- International equity markets demonstrate significant strain currently, with all risk indicators deviating from median ranges year over year, and four indicators now comfortably residing within extreme ranges.
- Index efficiency, correlation of returns and dispersion of returns have changed the most since the beginning of the year, with dispersion of returns and index efficiency now in the lower and upper deciles of all observations, respectively.
- Capital concentration remained on a consistent downward trend that began in 2013 and is approaching the lowest decile across all observations. This reflects a continuous shift of capital from the larger stocks to the smaller stocks within the universe.

U.S. Equity Market – S&P 500 Index

- With the exception of capital concentration, Intech's U.S. risk indicators continued to move further away from their normal ranges and have now reached extreme levels.
- Index efficiency has increased sharply since the end of last year and is now at its highest level in history. Similar levels were last seen in mid-2014 and leading up to the global financial crisis and tech wreck periods.
- Dispersion of returns is moving downward, confirming that stocks' relative volatility in the market remains low. This trend likely reflects a market driven by sentiment and macroeconomic dynamics rather than stocks' underlying fundamentals.

European Equity Market - MSCI Europe Index

- All of Intech's risk indicators are pointing to either extremely low or extremely high values on the European equity universe.
- Over the past 12 months, correlation of returns has come down significantly and index efficiency has been increasing.
- The European market seems less dominated by larger-cap stocks than its U.S. counterpart. Effectively, the concentration of capital measured on European equities continues to trend down and is currently ranking in the 16th percentile based on measures since 1992.

Emerging Markets Equities – MSCI Emerging Markets Index

- Emerging markets appear to demonstrate lower levels of market strain when compared to developed markets.
- While concentration of capital and skewness of returns are moving closer to historical average levels, index efficiency and dispersion of returns are reaching extreme levels when measured on the MSCI Emerging Markets Index.
- While the skewness of returns indicator remains above median level, reflecting investors' optimism on emerging markets equities, it has been trending down since the end of 2015.

For more information, please visit **janushenderson.com.**

Intech is a Janus Henderson subsidiary and subadvisor that uses a mathematical investment process to harness stock price volatility as a source of excess return and a key to risk control.

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Beta measures the volatility of a security or portfolio relative to an index. Less than one means lower volatility than the index; more than one means greater volatility.

Substantial Volatility refers to volatility which can sometimes lead to positive returns but is mostly associated with negative outcomes from equity markets.

Capture Ratio measures the percentage of index (market) performance an investment "captured" during periods when the index achieved gains (up capture) or declined (down capture). A capture ratio of 100% means investment performance went up or down exactly the same amount as the index.

Median measures the value in the midpoint of distribution of values. These are recalculated on a daily based on data from inception through the prior day's close.

Intech Investment Management LLC is a subsidiary of Janus Henderson Group plc and serves as the sub-adviser on certain products.

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