CONTRIBUTORS

Tim Edwards, PhD
Senior Director
Index Investment Strategy
timothy.edwards@spglobal.com

Craig J. Lazzara, CFA
Managing Director
Index Investment Strategy
craig.lazzara@spglobal.com

Fooled by Conviction

"Our destiny is frequently met in the very paths we take to avoid it."

- Jean de La Fontaine – Fable 16

EXECUTIVE SUMMARY

In order to improve performance, advocates of active management have begun to argue that managers should focus exclusively on their best ideas, holding more concentrated portfolios of securities in which they have the highest confidence. In contrast, we argue that if it becomes popular, such "high conviction" investing is likely to:

- Increase risk,
- Make manager skill harder to detect,
- Raise asset owners' costs, and
- Reduce the number of outperforming funds.

These arguments apply even if we accept that security selection skill is prevalent among active managers. Concentration only makes sense if managers have a particular type of skill, and this skill must be intrinsically rare.

INTRODUCTION

Most active managers fail most of the time, at least if we regard their underperformance of passive benchmarks as indicative of failure.[1] This fact is so well known and widely demonstrated that even staunch advocates of active management acknowledge it.[2]

What remains in dispute is what active managers should do to improve performance. Some argue that active management fails because it is not active enough. Active managers, it's said, are reluctant to deviate too much from a passive benchmark, knowing that their performance will be compared to it. They hold positions they don't find especially attractive, simply to ensure they do not fall too far behind their peers.[3] The proposed remedy for such "overdiversified" portfolios is for managers "**to invest with**

[1] Soe, Aye M., "SPIVA U.S. Scorecard," Year-End 2015; Johnson, Ben and Alex Bryan, "Morningstar's Active/Passive Barometer," April 2016.

[2] Willmer, Sabrina and Erik Schatzker, "Active Firms May Need to Shrink Assets by Up to $10 Trillion,", June 7, 2016.

[3] Clemons, G. Scott, "Passive Lessons for Active Investors," *Brown Brothers Harriman Quarterly Investment Journal*, Quarter 2, 2016.

high conviction, concentrating capital in the ideas they think are most likely to deliver strong long-term returns."[4]

The argument for concentration is not new, but has found new motivations.

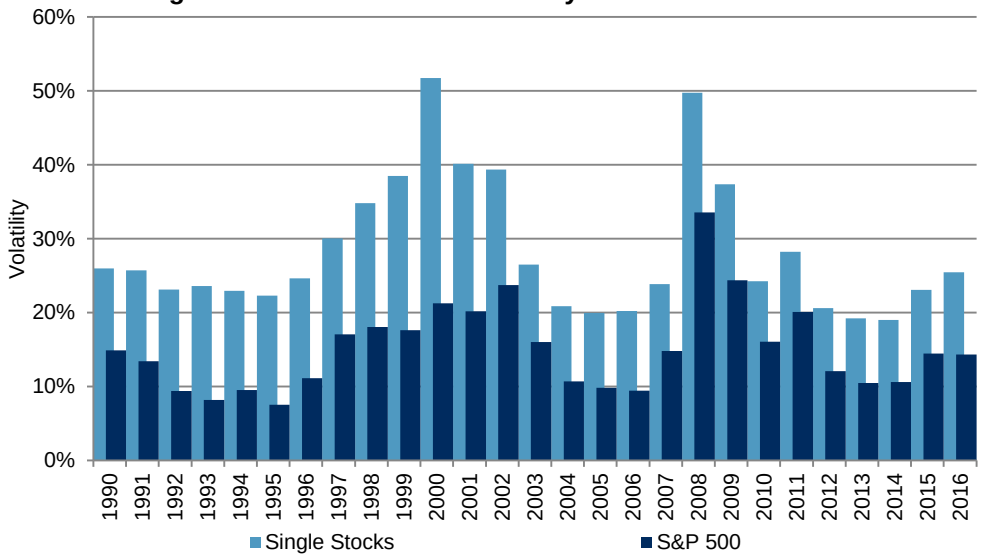
This is not a completely new argument; one of the putative remedies for managers embarrassed by their performance during the technology bubble of the late 1990s was to place more emphasis on their "best ideas." Yet the modern argument has attracted greater attention. In part, this is due to recent empirical evidence that managers deviating significantly from benchmarks had outperformed.[5] In another part, the argument for more aggressive positioning from active managers is a natural response to the general trend of lower dispersion among stocks that has emerged since the financial crisis—a phenomenon that has made even skillful stock-picking activities less rewarding.[6]

Suppose that active portfolios become substantially more concentrated in each manager's "best ideas." What might the consequences be?

FIRST CONSEQUENCE: RISK IS LIKELY TO INCREASE

Other things equal, more securities mean more diversification. Exhibit 1 makes the point using the S&P 500, comparing the average volatility of the index to the average volatility of its components.

Exhibit 1: Single Stock Versus Index Volatility



Source: S&P Dow Jones Indices LLC. Data as of June 2016. Volatiity is measured by the standard deviations of total return for index and constituents. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

[4] Kraus, Peter S., "Why the era of the 'closet benchmarker' has to end," *Financial Times*, May 17, 2016. See also Sebastian, Mike and Sudhakar Attaluri, "Conviction in Equity Investing," *The Journal of Portfolio Management*, Summer 2014,

[5] Petajisto, Antti, "Active Share and Mutual Fund Performance," *Financial Analysts Journal*, July/August 2013, pp. 73-93.

[6] Edwards, Tim and Craig J. Lazzara, "Dispersion: Measuring Market Opportunity," December 2013; Lazzara, Craig, "The Value of Skill," March 20, 2015.

Between 1991 and May 2016, the average volatility of returns for the S&P 500 was 15%, while the average volatility of the index's components was 28%.[7] The difference between one stock and 500 is an extreme case, but it serves to illustrate the obvious point: if the typical active manager owns 100 stocks now and converts to holding only 20 or so, the volatility of his portfolio will almost certainly increase.

In a world where all active managers concentrate their portfolios, fund owners face a dilemma. Asset owners have been known to grouse about the quality of active managers' performance, but we have yet to identify one who has expressed a desire to hold a riskier portfolio. For the asset owner, then, there are two possible ways to manage the increase in portfolio risk.

The first is for asset owners to retain the same *number* of active managers as before, but *reduce the proportion* that is actively managed. If overall pension fund volatility is to remain the same, the assets taken from active managers have to be put into some other—putatively less risky—investment. This is not in itself objectionable, but it does force asset owners to reduce the proportion of their allocation that they expect to outperform.

Manager aggressiveness forces asset owners to shift to a more conservative allocation, or to hire more managers.

Alternatively, asset owners who wish to retain the proportion of their portfolio that is entrusted to active managers must hire more of them. Instead of using 20 mangers each with 100 stocks, for example, a fund might achieve the same risk profile by using 100 concentrated managers, each holding 20 stocks. As well as the considerable additional time and expense required on the part of the asset owner,[8] this produces a major logical inconsistency. **In the name of conviction, managers who pick stocks are told to pick fewer stocks. As a consequence, asset owners who pick managers may be required to pick more managers.**

Thus, as asset owners cast a wider net to mitigate the now-higher risk of their incumbent managers, the increased concentration of active funds might prove advantageous only to consultants supporting the expanded effort to secure sufficiently diversified active exposures.

SECOND CONSEQUENCE: MANAGEMENT SKILL MAY BE HARDER TO DETECT, AND LESS LIKELY TO MATTER

Some managers may be skillful, but none are infallible. **A manager who is skillful but not infallible will benefit from having more, rather than fewer, opportunities to display his skill.** A useful analogy is to the house in a casino: on any given spin of the roulette wheel, the house has a small

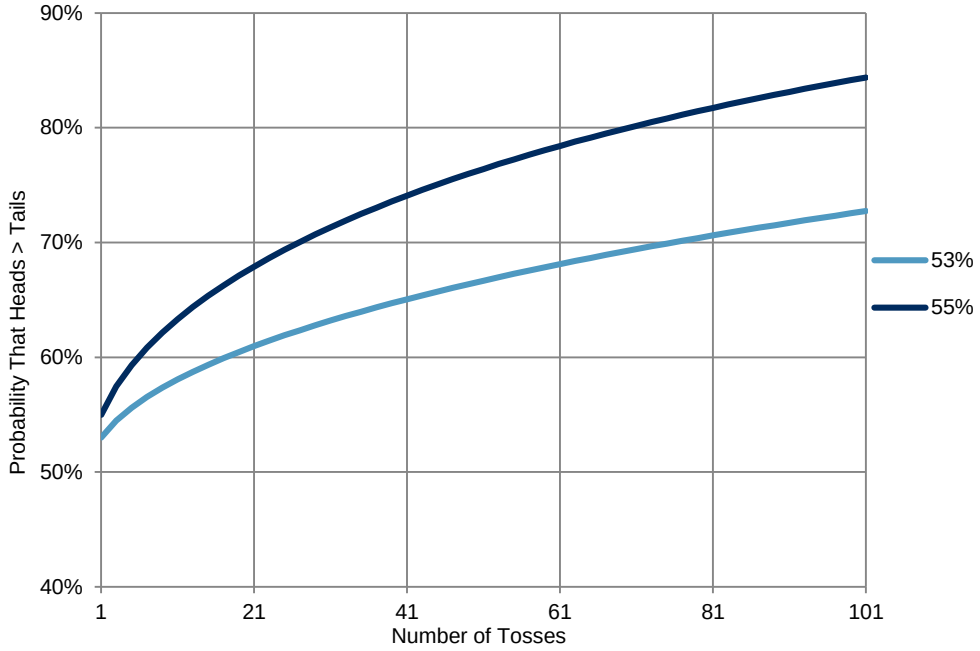
[7] The difference between an index's volatility and the volatility of its average component is summarized by the index's dispersion. See Edwards, Tim and Craig J. Lazzara, "At the Intersection of Diversification, Volatility and Correlation," April 2014.

[8] The evidence indicates that the difficulty of manager selection grows as fund owners try to select more managers. See Ferri, Richard A. and Alex C. Benke, "A Case for Index Fund Portfolios," June 2013.

likelihood of winning; over thousands of spins, the house's advantage is overwhelming.

Exhibit 2 illustrates the concept. In a coin-flipping game with a biased coin, we win the game if more than one-half of our tosses come up heads. In one case, the coin has a 53% chance of heads and in the other, the coin has a 55% chance of heads. As the exhibit shows, the chance of winning grows as the number of tosses rises and, for any number of tosses, the chance of winning is higher with the more favorable coin. However, if the number of tosses varies between the two coins, **at some point, it is preferable to have a worse coin and more tosses**.

Exhibit 2: Probability of "Winning" as a Function of Number of Tosses



Source: S&P Dow Jones Indices LLC. Chart is provided for illustrative purposes only.

The more picks a manager makes, the more likely his skill dominates his luck.

The analogy to security selection is straightforward: instead of flipping a coin, a manager picks stocks with a given probability of outperforming the market. If more than half of his picks outperform, the manager "wins" the game. The more picks he makes, the more likely it is that his skill dominates his luck. As with the coin-flipping game, for a constant number of stocks, a more skillful manager is more likely to outperform than a less skillful manager. But if the number of picks varies, an asset owner may be more likely to outperform with a less skillful manager who buys more stocks.

A manager with below-average skill, in this analogy, is also flipping a biased coin, but his coin has less than a 50% chance of coming up heads. Ironically, this manager has a better chance of winning the game the smaller the number of tosses (just as a skilled manager has a better chance the more he tosses). **Concentrating portfolios, in other words, makes it**

more likely that good managers will look bad, more likely that bad managers will look good, and more likely that asset owners' decisions will be informed by luck rather than skill.

THIRD CONSEQUENCE: TRADING COSTS MAY RISE

It is not certain whether the proponents of higher concentration would prefer to see smaller individual fund sizes, or whether their advocacy of concentration presumes a material increase in holding period and a considerable investment in reducing execution costs. However, if fund sizes do not materially decrease and funds don't rebalance less frequently, it is likely that trading costs will increase massively with higher concentration. This is because—at higher concentration—**both fund turnover and cost-per-trade are likely to increase.**

To see how fund turnover might rise, consider a simplified example. Two managers share the same security rankings but construct their portfolios differently. The first manager selects the top-ranked 10% of the universe, and operates the more concentrated fund. The second manager excludes the bottom-ranked 10% of the universe, therefore holding the top-ranked 90%. Suppose that in each quarter there is X% turnover in the securities ranked in the *top* 10% and the same X% turnover among the *worst* 10%.

It's difficult to escape the conclusion that turnover will rise as concentration rises.

Consider the turnover required for each manager, assuming that their portfolios are equally weighted and that they both rebalance once per quarter:

- The concentrated manager holds the top 10% of the universe; his turnover will therefore be X%.
- The "diversified" manager holds everything but the bottom 10%. There is X% turnover in the stocks he doesn't own, which leads to a turnover of (X/9)% in those he does.[9]

In this scenario, the concentrated manager's turnover is **nine times higher** than the diversified manager's turnover. Of course, the specifics depend on what fraction of the universe each manager chooses to hold (e.g., with quintiles instead of deciles, the concentrated manager's turnover would be "only" four times higher than the diversified manager's). But it's difficult to escape the conclusion that turnover will rise as concentration rises.[10]

Moreover, transaction costs per trade are also likely to rise. Transaction costs are not linear: there is typically a greater percentage cost associated with trading a higher percentage of the outstanding float in a security.

[9] Turnover of the bottom decile is X%, so as a fraction of the universe it is 0.1*X. The manager owns 90% of the universe. 0.1*X/0.9 = X/9.

[10] We ignore here the possible impact of a shifting active management zeitgeist. In a world of increased concentration and emphasis on using only a manager's "best ideas," our guess is that the managers would "try harder" to demonstrate their value and that turnover would increase for that reason as well.

Otherwise said, a manager is more likely be be able to purchase 10,000 shares in each of 100 companies with less market impact than he could buy 1,000,000 shares of a single company.

Thus, higher concentration can deliver a double blow to returns: higher turnover and a higher unit cost of execution.

FOURTH CONSEQUENCE: THE PROBABILITY OF ACTIVE UNDERPERFORMANCE MAY INCREASE

Higher trade sizes complete a double blow to returns.

Imagine a market with five (equally weighted) stocks, whose performance in a given year is shown in Exhibit 3. The market's return is 18%, driven by the outstanding return on stock E.[11]

Exhibit 3: Hypothetical Stock Returns Within a Five-Stock Market

STOCK	A	B	C	D	E
Return	10%	10%	10%	10%	50%

Source: S&P Dow Jones Indices LLC. Table is provided for illustrative purposes.

We can form portfolios of various sizes from these five stocks. There are five possible one-stock portfolios, four of which underperform the market as a whole. Alternatively, there are also five possible four-stock portfolios, four of which outperform the market as a whole. The expected return of the complete set of one-stock and four-stock portfolios is the same 18%, but the distribution of portfolio returns is different. **In this case, holding more stocks increases the *likelihood* of outperformance.**

We might suspect that there is a natural tendency toward a right skew in equities—after all, a stock can only go down by 100%, while it can appreciate by more than that.

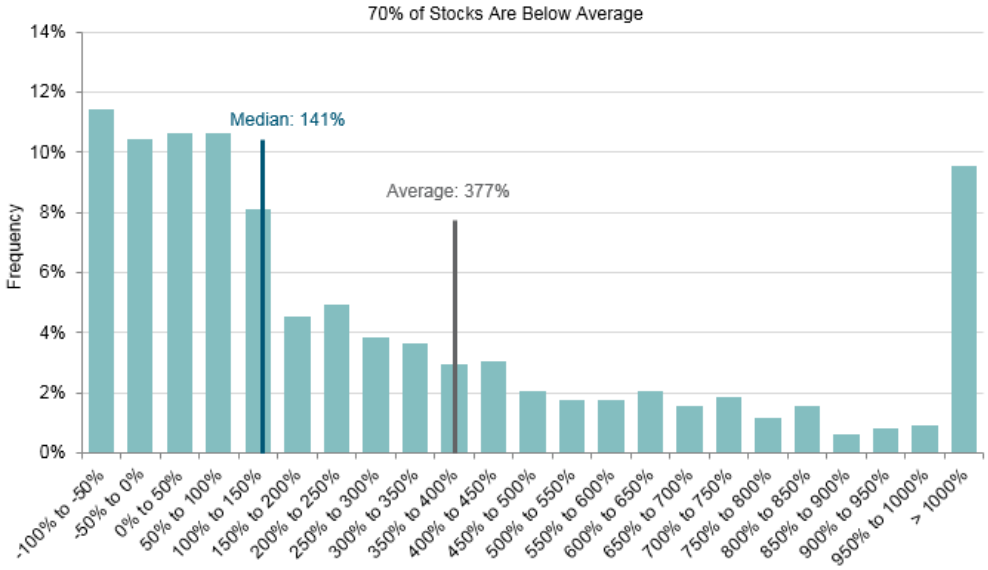
Of course this is a stylized example, which only "worked" because our hypothetical returns were skewed to the right; formally, the average return was greater than the median return. A different return pattern among the individual stocks would have produced a different result at the portfolio level—so the usefulness of our example hinges on an empirical question: to what degree are real-life stock returns skewed to the right?

We might suspect that there is a natural tendency toward a right skew in equities—after all, a stock can only go down by 100%, while it can appreciate by more than that.[12] This intuition is confirmed by Exhibit 4, which plots the distribution of cumulative returns for the constituent stocks of the S&P 500 for the 20 years ended May 2016. The median return was 141%, far less than the average of 377%.

[11] This example is drawn from Heaton, J.B., Nick Polson, and Jan Hendrik Witte, "Why Indexing Works," October 2015.

[12] Conversely, a left skew seems more likely in bonds, where potential outcomes are limited to either a return matching the yield to maturity, or a significant loss in case of default.

Exhibit 4: Distribution of Cumulative Returns for S&P 500 Constituents



Source: S&P Dow Jones Indices LLC, Factset. Data from May 1996 through May 2016. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

It is more sensible to focus on excluding the least desirable stocks, rather than picking the most desirable—the opposite of what a concentrated portfolio will do.

Note that the positive skew in equity returns demonstrated by Exhibit 4 is not simply a long-term phenomenon: in the 25 years between 1991 and 2015, the average S&P 500 stock outperformed the median 21 times.[13]

If stock returns are skewed to the right, **portfolios with fewer stocks are more likely to underperform** than portfolios with more stocks, because larger portfolios are more likely to include some of the relatively small number of stocks that elevate the average return. Indeed, the logic of skewed returns is that **it is more sensible to focus on excluding the least desirable stocks than on picking the most desirable**—the opposite of what a concentrated portfolio will do.

THE PRESUMPTION OF SKILL

The four consequences we've suggested—higher risk, greater dominance of luck over skill, higher costs, and fewer outperforming funds—are likely and logical outcomes of higher concentration. Notice that all of them apply even for active managers with genuine stock selection skill. Once we consider the scarcity and nature of skill, however, the case against greater concentration becomes even more compelling.

The advocates of portfolio concentration assume that it will improve performance, and there is at least some evidence that funds showing greater conviction in their portfolios, as measured by active share, have

[13] We find similar results in other markets. The average stock outperformed the median 12 of the last 16 years for the S&P/TSX Composite, 19 of the last 20 years for the S&P/TOPIX 150, 8 of the last 15 years for the S&P/ASX 200, and 19 out of 19 years for the S&P Pan Asia ex-Japan & Taiwan BMI.

obtained better results.[14] The evidence is not undisputed,[15] and in any event it's important to note that **the relationship between good performance and high active share cannot be causal**. If it were, an underperforming manager could sell half the names in his portfolio (chosen at random) and improve his results. Culling the names in this way will surely raise active share, and yet no reasonable observer would argue that it will have anything other than a random effect on performance.

The argument for concentration ultimately relies on two assumptions about manager skill: that skill exists, and that it is *particularly acute at the extremes* of conviction. For instance, not only must a manager be able to assemble a 100-stock portfolio that will outperform on average, he also must be able to identify which 20 stocks of the initial 100 are worth the risks of concentration.[16] **For concentration to work, both of these assumptions (that skill exists, and that it is acute at the extremes) must be true simultaneously. There is no evidence that either of them is.**

The evidence that manager skill is ephemeral is strong.

On the contrary, the evidence that manager skill is ephemeral (indeed chimerical) is strong.

- The professionalization of the investment management business in the decades after World War II meant that professional investors were, and still are, competing against rivals as skilled as themselves. This means that the only source of excess return, or positive alpha, for the winners is the negative alpha of the losers, so that in aggregate, active management must be a zero-sum game.[17]
- Because passive investors simply own a slice of the market, their aggregate portfolio and the aggregate portfolio of all active managers will be the same. Since passive investment is intrinsically cheaper than active management, "after costs, the return on the average actively managed dollar will be less than the return on the average passively managed dollar."[18]
- In support of these conceptual points, the empirical evidence is unequivocal. Most active managers underperform benchmarks appropriate to their investment style,[19] and the comparisons become more arduous as the timeframe for evaluation lengthens. Moreover,

[14] Petajisto, *op. cit.*

[15] Frazzini, Andrea, Jacques Friedman, and Lukasz Pomorski, "Deactivating Active Share," *Financial Analysts Journal*, March/April 2016, pp. 14-21.

[16] Specifically, they must be sufficiently distinguished to compensate for higher risk, higher trading costs, and higher influence from chance effects.

[17] Ellis, Charles D., "The Loser's Game," *Financial Analysts Journal*, July/August 1975, pp. 19-26.

[18] Sharpe, William F., "The Arithmetic of Active Management," *Financial Analysts Journal*, January/February 1991, pp. 7-9.

[19] Soe, Aye, *op. cit.* N.B. This work uses capitalization-weighted indices as benchmarks. See also Lazzara, Craig, "Even Worse Than You Think," June 19, 2014.

there is scant evidence of the persistence of above-average performance. A manager is no more likely to be above average two years in a row than he is to toss a fair coin and get two consecutive heads.[20]

FINAL THOUGHTS

A manager who chooses to concentrate can only hope to improve his results if he has a particular type of skill, and this skill must be quite rare.

Active management is intrinsically difficult. The tendency of most active managers to underperform passive benchmarks has, if anything, grown in recent years, and this has led some observers to advocate that active managers should become more aggressive and operate more concentrated portfolios. A manager who chooses to concentrate can only hope to improve his results if he has a particular type of skill, and this skill must be quite rare. **If this were not so, active funds would not be facing a performance challenge in the first place.**

For the industry as a whole, higher concentration levels may raise active risk, make skill harder to detect, increase costs, and reduce the number of outperforming funds. Furthermore, it may confuse, rather than clarify, the interaction of asset owners and asset managers.

Skillful managers sometimes underperform; unskillful managers sometimes outperform. The challenge for an asset owner is to distinguish genuine skill from good luck. The challenge for a manager with genuine skill is to demonstrate that skill to his clients. The challenge for a manager without genuine skill is to obscure his inadequacy. **Concentrated portfolios will make the first two tasks harder and the third easier.**

[20] Soe, Aye M., "Does Past Performance Matter? The Persistence Scorecard," January 2016.

S&P DJI Research Contributors		
NAME	**TITLE**	**EMAIL**
Charles “Chuck” Mounts	Global Head	charles.mounts@spglobal.com
Global Research & Design		
Aye M. Soe, CFA	Americas Head	aye.soe@spglobal.com
Dennis Badlyans	Associate Director	dennis.badlyans@spglobal.com
Phillip Brzenk, CFA	Director	phillip.brzenk@spglobal.com
Smita Chirputkar	Director	smita.chirputkar@spglobal.com
Rachel Du	Senior Analyst	rachel.du@spglobal.com
Qing Li	Associate Director	qing.li@spglobal.com
Berlinda Liu, CFA	Director	berlinda.liu@spglobal.com
Ryan Poirier, FRM	Senior Analyst	ryan.poirier@spglobal.com
Maria Sanchez	Associate Director	maria.sanchez@spglobal.com
Kelly Tang, CFA	Director	kelly.tang@spglobal.com
Peter Tsui	Director	peter.tsui@spglobal.com
Hong Xie, CFA	Director	hong.xie@spglobal.com
Priscilla Luk	APAC Head	priscilla.luk@spglobal.com
Utkarsh Agrawal, CFA	Associate Director	utkarsh.agrawal@spglobal.com
Liyu Zeng, CFA	Director	liyu.zeng@spglobal.com
Akash Jain	Associate Director	akash.jain@spglobal.com
Sunjiv Mainie, CFA, CQF	EMEA Head	sunjiv.mainie@spglobal.com
Daniel Ung, CFA, CAIA, FRM	Director	daniel.ung@spglobal.com
Andrew Innes	Senior Analyst	andrew.innes@spglobal.com
Index Investment Strategy		
Craig J. Lazzara, CFA	Global Head	craig.lazzara@spglobal.com
Fei Mei Chan	Director	feimei.chan@spglobal.com
Tim Edwards, PhD	Senior Director	tim.edwards@spglobal.com
Anu R. Ganti, CFA	Director	anu.ganti@spglobal.com
Hamish Preston	Senior Associate	hamish.preston@spglobal.com
Howard Silverblatt	Senior Industry Analyst	howard.silverblatt@spglobal.com

GENERAL DISCLAIMER