NEUBERGER BERMAN

GENESIS SMALL-CAP EQUITY TEAM

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THE ROLE OF CENTRAL BANK POLICIES IN SMALL-CAP ACTIVE MANAGER PERFORMANCE CYCLES

Despite the growing popularity of passive small-cap equity vehicles, these strategies pose unique—and often overlooked—risks to investors that are materially different from and significantly elevated relative to those inherent in the large-cap space. These risks are both structural and temporal in nature, and are closely related to cycles in capital markets activity, which in turn is heavily influenced by monetary policy.

EXECUTIVE SUMMARY

- **We believe that there are unique risks associated with the majority of passive small-cap ETFs and index strategies that are materially different and substantially elevated relative to those present in the large-cap equity market. Critically, the magnitude of these risks fluctuates dramatically in cycles that can be tied to capital markets activity via initial public offerings (IPOs) as well as secondary offerings.** These newly minted securities populate the primary small-cap indexes when they go public, while secondary offerings increase a given security's representation in the index due to the float-adjustment mechanism used to weight individual securities. (Secondary offerings create more public "float," which is a determinant of the security weighting in the index.)
- **Capital markets cycles can be tied back to central bank easing cycles.** Riskier securities tend to access public equity markets when discount rates (interest rates) are very low or dropping, as investors seek out long-duration securities. Think about the dot-com/tech stocks of the late '90s or the biotech/social media stocks more recently. Very low interest rates make distant cash flow streams much more valuable while near-term cash flow streams become less valuable. **Importantly, historically active managers lag during these cycles of heavy capital markets activity. We suspect this is because active managers don't embrace the growing risk that is reflected in the index and thus replicated in passive small-cap strategies.**
- The vast majority of equity indexes are market cap weighted adjusted for float (freely traded shares).[1] The S&P 500 and the Russell 2000 are two of the more popular examples of cap-weighted, float-adjusted indexes. As a result, **the passive investor owns more or less of a given security or sector based solely on float-adjusted market value. If this sounds a lot like momentum investing, it should. There is NO fundamental judgment involved.** Moreover, as net flows into indexes increase, these flows are concentrated in the largest market capitalization constituents, causing a self-fulfilling price momentum loop.
- **The fear of litigation in the sizable 401(k) space is accelerating the move to lower-cost passive alternatives, as fiduciaries can be sued for recommending higher-cost active managers when they fail to outperform a benchmark for extended time periods.** Fiduciaries, however, should remember that cost is only one factor in satisfying the "best interest" fiduciary standard. **There is no safe harbor or litigation-avoidance strategy for simply selecting the lowest-cost manager or favoring a passive strategy over an active manager.** For example, if a fiduciary were to select a passive option without appropriate consideration of the inherent risks in that option versus the risks in other alternatives, that could serve as the basis of a lawsuit. Fiduciaries should be aware that the unprecedented low interest rate environment of the last eight years since the Great Financial Crisis—both in terms of magnitude and duration—has elevated risk in the popular small-cap indexes via an extended capital markets cycle. For example, the percentage of companies in the Russell 2000 reporting GAAP losses recently eclipsed the previous peak set during the dot-com mania, one of the more infamous spikes in equity market risk associated with a previous capital markets cycle. If the past is prologue, this could be a particularly inopportune time to index.
- Individual equities represent ownership in discrete businesses that produce radically different cash flow streams for their owners over time. **The collective intervention and associated judgments of a large population of active managers plays a critical role in properly pricing these cash flow streams and thus allocating capital. Passive strategies that merely mimic an index make no such distinction. It follows that as passive investing grows, price discovery suffers and inefficiency rises.** There is growing evidence of this inefficiency; as of December 31, 2016, passive investing comprised 45% of the large-cap equity market and 39% of the small-cap equity market (reflecting all mutual funds and ETFs).
- The broadly utilized Russell 2000 and CRSP U.S. Small Cap indexes have very little dispersion of constituent weights, as both indexes attempt to capture a tight range of market capitalizations. As a result, **passive flows are much more impactful and one could argue much more distortive in the small-cap market.** This is another key difference versus the S&P 500, where market caps are widely varied[2] and consequently passive money flows to liquidity. Critically, the criteria for

[1]A recent study Jeffries performed on our behalf found that as of December 31, 2016, more than 90% of passive AUMs are invested in some form of market cap weighted structure.

[2]As of December 31, 2016, the largest weighting in the S&P 500 was over 500 times the size of the smallest.

membership in the S&P 500—which includes market capitalization, liquidity, having U.S. headquarters and profitability—ensures that constituents are of much higher quality. In contrast, **there are no quality constraints in the popular small-cap indexes, only size constraints. Since the vast majority of IPOs are done by small companies, they tend to populate the Russell 2000 in distinct cycles while the S&P 500 is much more stable.**

- **Extended periods of extremely low interest rates not only shift investor risk preferences toward long-duration cash flow streams in equity markets but also tend to cause investors to favor higher-risk balance sheets.** Just as individual savers are penalized and borrowers benefit from low interest rates, so do their corporate equivalents. Corporate "savers" with unlevered, cash-rich balance sheets experience declining interest income, while interest expense falls at leveraged companies via a refinancing cycle. Debt-laden companies tend to outperform in these capital markets cycles that are characterized by low and declining interest rates. **This occurs in conjunction with the equity IPO cycle and compounds the elevation of risk in the popular small-cap indexes.**
- **Leveraged small companies are MUCH more exposed to rising interest rates than their large-cap peers due to their shorter average debt maturities.** The preponderance of investment grade-rated companies in the S&P 500 (roughly 91% by index weight) allows for broad access to 30-year debt. The comparable figure of investment grade-rated companies in the Russell 2000 is roughly 9%. Moreover small-cap debt maturities are clustered in the one- to five-year range, with much more exposure to LIBOR-based floating-rate loans than large-cap peers.
- The primary long-duration credit markets accessed by small caps are the high yield debt and leveraged loan markets. Not surprisingly, financing cycles in these markets mirror the capital markets cycles in equities, largely because they are fueled by the same central bank policies that produce very low interest rates. **Exacerbating the risk of rising leverage, the weakest borrowers tend to access the credit market during these Fed easing cycles, typically on terms and conditions that favor the borrower. Large waves of defaults invariably follow these credit binges.**
- **It is clear that securities lending is pervasive, if not universal, in the passive space.[3] This income stream is being used to offset management fees and trading costs.** These fees can be substantial in illiquid markets such as small caps. For example, securities lending for the popular iShares Russell 2000 ETF (IWM) accounted for roughly 26 basis points of offsets against fees in 2016. Moreover, the magnitude of this income stream/fee offset appears to be rising over time. While it is beyond the scope of this paper, the risks associated with the practice remain to be seen in this cycle.[4]
- While the focus of this study was the small-cap market, there are interesting similarities in active manager performance cycles in the large-cap market. **Large-cap active managers appear to struggle in the same time periods as their small-cap peers.** While the large-cap markets are not materially influenced by IPO activity, it is quite possible that long-duration large-cap equities are repriced upward during these easing cycles. (Think about the "FANG" stocks—Facebook, Amazon, Netflix and Google—as examples of rapidly growing companies with long-duration cash flows.) Another possible indicator of this phenomenon is the performance trend of active managers when the cap-weighted S&P 500 is outperforming the equal-weighted S&P 500. The equal-weighted S&P 500 has dramatically outperformed the cap-weighted index over the last 25 years, yet active managers struggle when the cap-weighted index outperforms. **We believe this may be due to investors crowding into the index's longer-duration securities, but that's a discussion for another paper.**

[3]Our research shows that of the 19 largest passive small-cap ETFs, accounting for 88% of the total small-cap ETF assets under management, 18 either outperformed the underlying benchmark or underperformed by less than the expense ratio. Profits from security lending are likely behind these results.
[4]CALPERS disclosed in public reports that during the financial crisis it lost $634 million in its securities lending program for the fiscal year ended March 2009.

METHODOLOGY

This white paper seeks to shed light on some of the unique risks associated with most passive small-cap equity ETF and index strategies, risks that are materially different and substantially elevated relative to those present in the large-cap market. These risks tend to exist in any small-cap equity index that has no fundamental quality filters and seeks to mirror a particular market cap segment. The most prominent small-cap indexes are the Russell 2000 Index and the CRSP U.S. Small Cap Index; roughly two-thirds of all passive small-cap passive vehicles track one of these.

We used the Russell 2000 as the primary small-cap benchmark in this study for a few reasons. The Russell 2000 is broadly quoted and has a fairly long history of robust data. Moreover, it is the basis for the largest small-cap ETF on the market: the iShares Russell 2000 ETF. The CRSP U.S. Small Cap Index shares many attributes with the R2000 and has similar performance patterns over time. Most important, like the Russell 2000, market cap is the primary criteria for inclusion in the CRSP U.S. Small Cap Index.[1]

The largest small-cap passive player is Vanguard Small Cap strategy, which is available as both an index fund and an ETF; both tracked the Russell 2000 in their early history but presently track the CRSP U.S. Small Cap Index. Vanguard and iShares (managed by BlackRock) comprise nearly half of all passive small-cap assets under management.

This report references actual index returns as a proxy for passive performance. Our analysis indicates that recent realized passive returns are very close to the index returns despite fees, transaction costs and tracking error. In some cases passive returns are even moderately higher than their underlying index returns. Securities lending, which appears to be pervasive in the passive space, has played a significant role in offsetting these aforementioned expenses. For example, the iShares Russell 2000 ETF realized 26 basis points as an offset to fees in 2016. While active managers can and do engage in securities lending, studies suggest this practice is less prevalent, if for no other reason than active managers would prefer not to facilitate the shorting of stocks they hold long.

An examination of ETF securities lending practices by Morningstar found, among other things, that "the risks assumed by the ETF provider and the ETF's investors are asymmetric"; since providers are able to participate in any profits generated by their securities lending program without being liable for losses, they are incentivized to invest collateral aggressively. The report also noted "the transparency of securities-lending programs leaves much to be desired."[2] The sustainability of returns and risks associated with securities lending are beyond the scope of this paper. That said, the returns associated with this practice are material. We are uncertain if the associated risks are as well.

This analysis was performed using all actively managed funds within Morningstar's Small Cap Blend Category as of December 2016 versus the Russell 2000 core small index. Lipper was also examined as a data source for active performance, but there was little difference between the performance of the Morningstar and Lipper categories. Arguably, both Lipper and Morningstar have some classification issues across style categories. We acknowledge that in the post-Great Financial Crisis world, correlations have risen to create some additional categorization challenges. In any case, no attempt was made to adjust style classifications. Finally, mutual funds that were merged or went out of existence were included in the analysis to minimize the potential for survivorship bias.

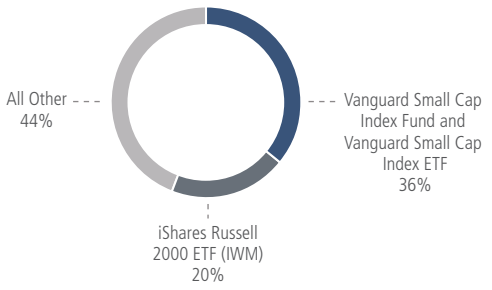
[1]Both indexes contain some liquidity hurdles but no fundamental criteria. The CRSP U.S. Small Cap Index tracks the bottom 2% – 15% of investible market cap for U.S. companies trading on NYSE, NYSE Market, NASDAQ or ARCA. (Below 2% is the Micro Cap Index.) There is no stated lower limit on market cap in the index, but there are investability screens for the overall CRSP universe (at least $15 million to be first added to the universe, then removed from the universe if below $10 million on rebalancing). The index is float adjusted and market cap weighted.

[2]"Understanding Securities Lending in ETFs," http://www.morningstar.com/advisor/t/88762578/understanding-securities-lending-in-etfs.htm

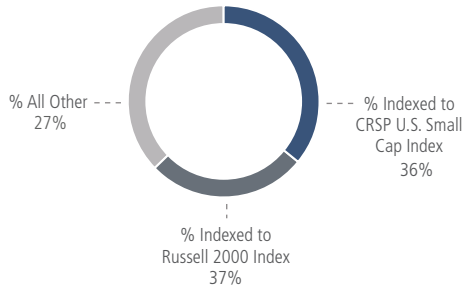
FIGURE 1. A LOOK AT THE PASSIVE LANDSCAPE

As of December 31, 2016; includes both open-end and exchange-traded funds

The Top Three Small-Cap Core Index Funds Comprise Over 50% of All Passively Managed Assets



Roughly 2/3rds of All Small-Cap Core Passive Vehicles Mirror Russell 2000 or CRSP U.S. Small Cap Index



Source: Furey Research Partners, Morningstar.

GENERAL OBSERVATIONS/CONCLUSIONS

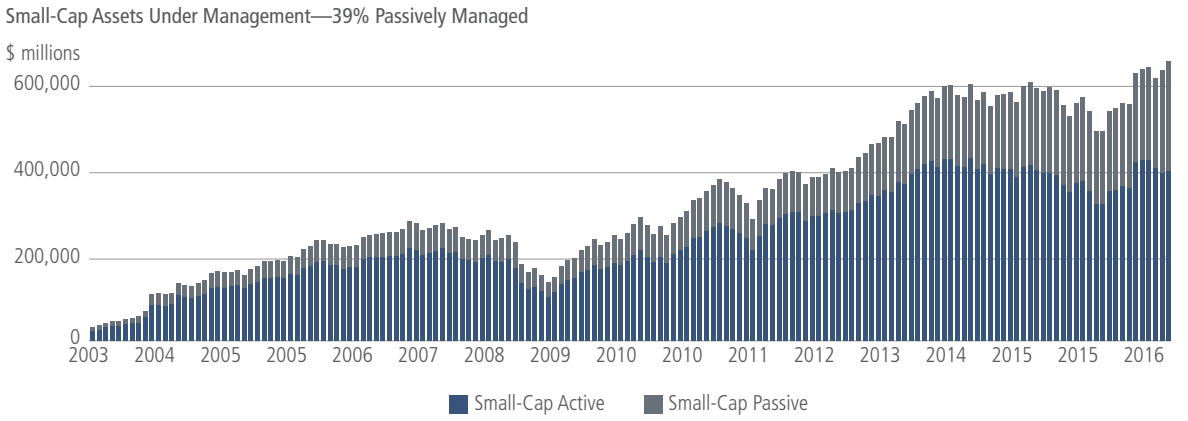
We believe that active and passive strategies both are likely to continue to play an important role in small-cap equity asset allocation. Passive approaches certainly have proven effective in lowering fees and enhancing returns for investors. However, unless equities are viewed as fungible commodities, active management will always be required in order to efficiently allocate capital. Individual equities represent ownership in discrete businesses that produce radically different cash flow streams for their owners over time. The collective intervention and the associated judgments of a large population of active managers play a critical role in properly pricing these cash flow streams and thus allocating capital. Passive index strategies that merely mimic an index make no such distinction.

This brings up another important and related point. Passive index and ETF investing inadvertently converts the index investor into a momentum investor. The passive buyer is merely replicating the sector and stock weighting in a given index, and thus the index investor will own more or less of a given security based solely on market value. There is no fundamental judgment involved. Moreover, as net flows into indexes increase, these flows are funneled toward the constituents with the largest market capitalizations, fostering a self-fulfilling price momentum loop. This momentum bias is present in nearly all ETFs and index funds, including the largest, most-liquid equity indexes such as the S&P 500. However, as indexation and ETFs have spread to less-liquid, less-efficient markets, this momentum effect carries with it a much greater risk for the passive investor as we will demonstrate shortly. **Moreover, this risk appears to ebb and flow with what we refer to as the capital markets cycle, which in turn is heavily influenced by monetary policy. This represents the most important and central conclusion of this analysis.**

It's highly likely that the money flows into passive strategies have tended to drive up equity correlations, further pressuring alpha generation for active managers. This is particularly true in small-cap markets, where quality differentials are very wide (versus an index like the S&P 500) but market cap spreads are very tight due to the index construct. The issue of rising correlations in conjunction with growth in passive investment strategies was analyzed in our 2013 white paper "Small-Cap Distortions: Is There Hope for Active Managers?" and therefore will not be addressed here. Among other topics, the report examines the dramatic rise in small-cap correlations, connecting it to the emergence and significant growth of small-cap ETFs.

Beyond driving up stock correlations in the small-cap market, money flows into passive strategies appear to create a self-fulfilling prophecy of improved index performance versus active equity managers. Over the last 15 years, small-cap passive ETFs and index funds have dramatically grown share of total small-cap assets under management, as shown in Figure 2. Over this time period, passive strategies outperformed in quarters during which ETF flows exceeded active mutual fund flows. The opposite was true during quarters when flows into active small-cap funds exceeded ETF flows. In our opinion, this money flow impact could be substantial and will be discussed shortly.

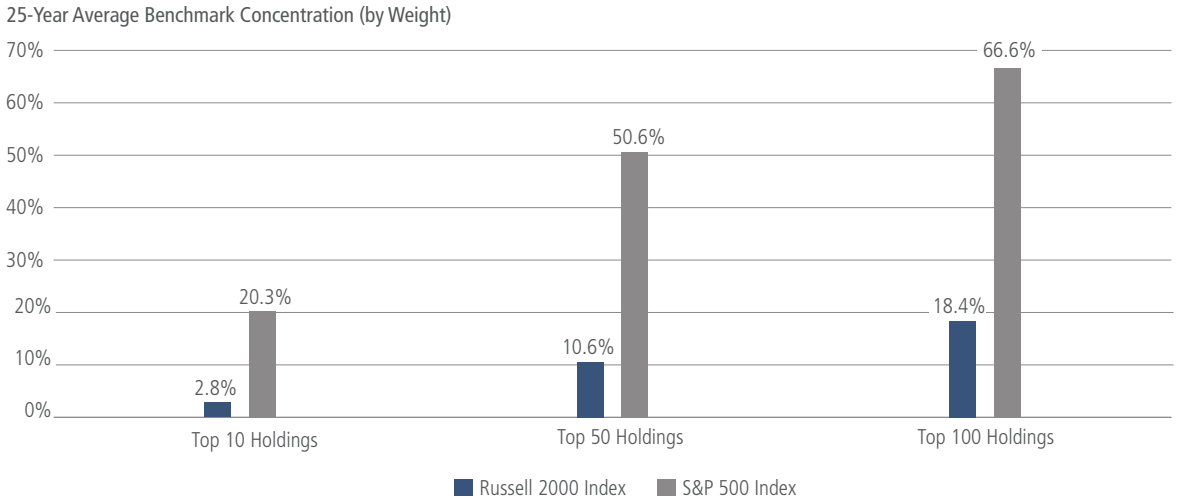
FIGURE 2. PASSIVE STRATEGIES CONTINUE TO INCREASE THEIR SHARE OF THE SMALL-CAP MARKET
As of December 31, 2016



Source: Citi Research, EPFR Global, Bloomberg.
Note: Data represent assets under management for all mutual funds and exchange traded funds.

Unlike the S&P 500, the Russell 2000 has minimal weighting differentials across securities in the index, as shown in Figure 3. As a result, passive flows into the Russell 2000 are spread fairly evenly across all 2,000 securities. To the extent the Russell 2000 becomes populated with riskier securities via the IPO market, as seems to be the case during periods of aggressive central bank liquidity policies, passive flows tend to drive up the prices of these riskier securities. Active managers, who likely underweight these riskier segments of the market, tend to lag the index in these environments.[5] Thus a virtual cycle can occur as active managers are redeemed and passive funds are purchased. This can persist until something shifts the liquidity regime behind this phenomenon.

FIGURE 3. THE RUSSELL 2000 HAS MINIMAL WEIGHTING DIFFERENTIALS ACROSS ITS CONSTITUENTS
As of December 31, 2016



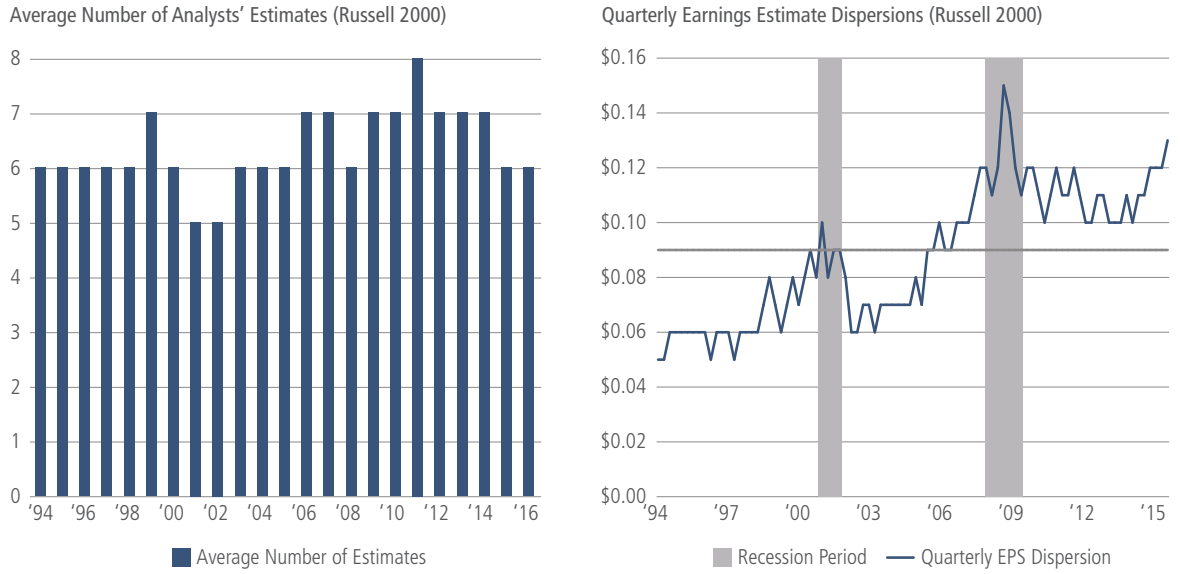
Source: Jeffries, Russell Investment Group.

This behavior pattern was evident during significant central bank liquidity infusions over the past two decades. Investor risk preferences shifted fairly violently and without much warning in these prior cycles. It would appear that the longer and more aggressive the central bank easing policies, the greater the accumulation of risk in the mainstream small-cap indexes and the more violent the adjustment. If true, the current environment of unprecedented central bank liquidity would appear to be a particularly inopportune time to adopt a passive strategy in the U.S. small-cap equity market (and perhaps in many other market segments, including fixed income).

Active manager relative performance has weakened considerably in the post-Great Financial Crisis era, particularly in the U.S. small-cap market. Historically, active manager alpha generation in small-cap stocks was thought to be driven by the underlying inefficiency of the market. There is little evidence that U.S. small-cap securities have become more efficient; as shown in Figure 4, analyst coverage of stocks in the Russell 2000 hasn't changed much since the mid-1990s, while the dispersion of quarterly earnings estimates has actually grown. Thus, the opportunity to add alpha should theoretically be equal to or perhaps even greater than prior periods when active manager relative performance was much more robust.

[5]For example, the technology and telecom sector comprised nearly 40% of the Russell 2000 Index at the 2000 peak of the dot-com bubble, compared to an exposure of around 20% by active small-cap equity managers at the same point in time.

FIGURE 4. LITTLE EVIDENCE OF IMPROVED EFFICIENCY IN THE SMALL-CAP EQUITY MARKET
As of December 31, 2016



Source: BofA Merrill Lynch Global Research, Jeffries, Russell Investment Group.

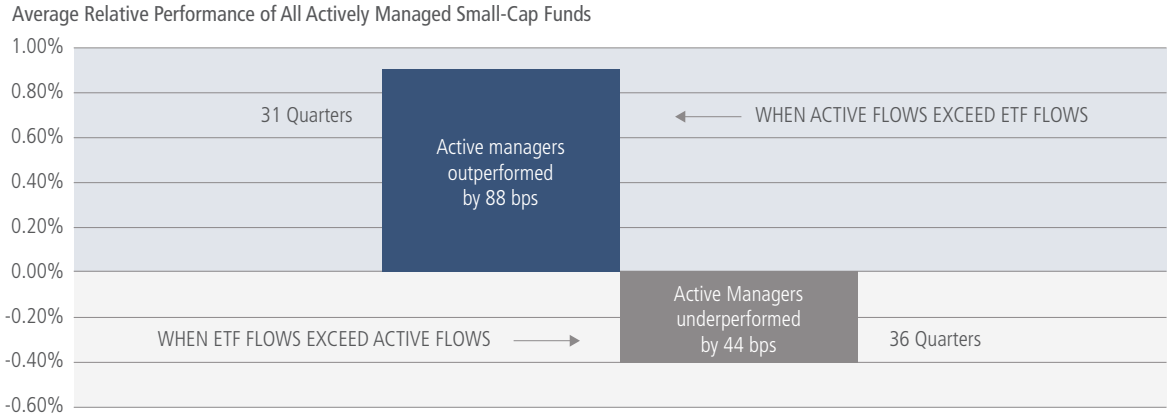
The lengthy period of active manager underperformance since the financial crisis appears to be at least partially attributable to central bank policies launched in response to it. Not only do prolonged periods of aggressive central bank easing policies create challenging environments for active managers by shifting risk preferences and driving up correlations, underlying small-cap indexes also appear to become "riskier" during these periods. This environment, particularly one as long as the current one, likely prompts investors to move to passive strategies at a time when risk in the underlying index is high and rising. Needless to say, this capital markets risk fluctuates much more dramatically in the small-cap indexes than say the S&P 500.

PASSIVE FLOWS: THE TIDAL WAVE

Earlier we showed the cumulative assets under management and market share for active and passive small-cap equity strategies. The self-fulfilling virtual cycle created by these flows is captured in Figure 5, which shows fund flows from June 2000 to December 2016 (June 2000 was chosen to coincide with the launch of the iShares Russel 2000 ETF). Of the 67 quarterly observations, 36 of these quarters saw small-cap ETF flows exceed active mutual fund flows; on average, ETFs outperformed active managers by 44 basis points per quarter in these time periods. During the 31 quarters when active flows exceeded passive flows, active managers outperformed ETFs by an average of 88 basis points per quarter. There is also evidence, as depicted in Figure 6, that ETF trading activity has an outsized impact on the smallest names in the index.

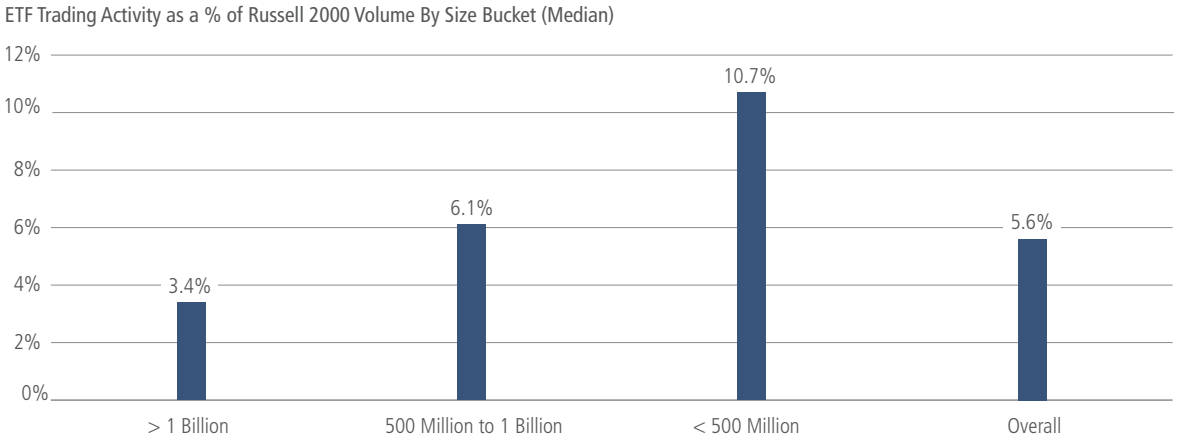
In such a scenario, money flows—not fundamental business judgment—tend to establish asset prices. Capitalism, however, is predicated on the concept that capital—relatively scarce and costly—is rationed in such a way that it flows primarily to the most deserving business models, enabling them to thrive; underserving models, in contrast, are denied capital and thus wither and inevitably collapse. This "creative destruction" has been lacking in the post-crisis liquidity environment, and price inefficiency and capital misallocation have been the unavoidable outcomes of passive investing's dominance of capital allocation. In our view, this cannot go on forever; ultimately we should return to a capitalist environment in which fundamentals drive stock prices and companies with strong balance sheets and positive cash flow attract a greater share of investment.

FIGURE 5. ETF FLOWS HAVE A SIGNIFICANT IMPACT ON RELATIVE PERFORMANCE
June 2000 through December 2016



Source: Furey Research Partners, Morningstar.
Note: Data represent the Morningstar Small Blend Category excluding all passively managed open-end mutual funds or exchange traded funds. Data begin June 2000 to coincide with the launch of the iShares Russell 2000 ETF.

FIGURE 6. ETFS APPEAR TO HAVE AN OUTSIZED IMPACT ON TRADING VOLUME IN THE SMALLEST NAMES
As of December 31, 2016



Source: Jefferies, Russell Investment Group, FactSet.
Note: Data represent % of market cap adjusted for float.

To the extent passive flows boost index performance, their influence can have a multiplier effect as active managers come under greater scrutiny and pressure to keep up with the index. The longer the active manager lags, the greater the pressure to look more like the index, or at least partially neutralize some bets. In the small-cap market, this usually means taking more risk.

COMPARING THE RUSSELL 2000 TO THE S&P 500

As noted earlier, the S&P 500 is designed to reflect the makeup of the U.S. economy. It incorporates admission criteria—including market capitalization, liquidity, having a U.S. headquarters and profitability—that bias the index toward quality. There are no such admission criteria for the Russell 2000. It's merely a snapshot of the next 2,000 companies by market cap beneath the 1,000 largest companies. It is rebalanced each June, but IPOs are included for off-cycle admission on a quarterly basis. This is the first hint of the impact of the capital markets cycle.

Small-cap indexes have materially higher turnover than large-cap indexes. Over the past 25 years, 20% of the Russell 2000 turned over on average each year, nearly seven times faster than the S&P 500's 3% churn. The constituents of the Russell 2000 are obviously entering and exiting the index at an elevated rate. Clearly there is more risk/volatility down the capitalization curve and thus greater degrees of success and failure. Small caps are constantly falling below or appreciating above the index's market cap criteria and creating turnover in the index during annual rebalancing. However, another important driving force behind this elevated turnover is the status of the capital markets. Wide-open capital markets translate into an abundance of secondary offerings/IPOs, both of which tend to drive company and sector weightings of the Russell 2000. Similarly, failure rates rise for this capital-dependent cohort when capital markets are closed or very tight.

While both the S&P 500 and the Russell 2000 are cap weighted and float adjusted, the significant difference in average benchmark concentration may help explain the earlier chart showing the self-prophesizing nature of small-cap flows. To the extent lower-quality securities begin to populate the Russell 2000, passive money flows likely have a potentially larger influence on small-cap index performance.

RISK AND THE CAPITAL MARKETS CYCLE

In the last two decades there were three distinct capital market cycles in which central bank liquidity injections materially influenced capital markets behavior and risk preferences. These were, in chronological order:

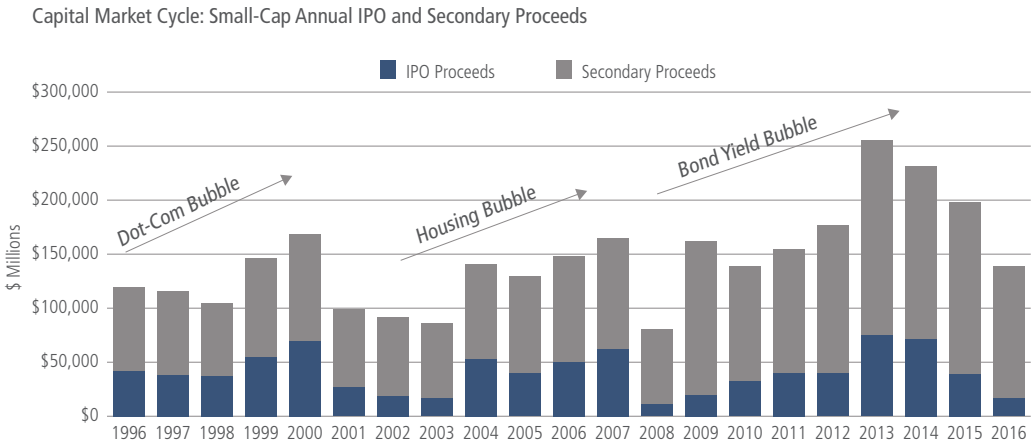
- The dot-com bubble/Greenspan Fed (1996 – 2000)—prompted by fears of potential economic and markets disruption from Y2K
- The housing bubble/Bernanke Fed (2002 – 2007)—to counter the dot-com collapse
- The bond market bubble/Bernanke & Yellen Fed (2009 – now)—to counter the housing collapse

We will look at each of these time periods to shed light on the capital markets cycle and associated risks that developed in the small-cap market. We will also look at other high-level indicators of the ebb and flow of risk in the small-cap market.

An analysis of annual IPO and secondary proceeds is shown in Figure 7. IPO issuance is largely a small-cap phenomenon; the market cap criteria for the Russell 2000 and comparable small-cap indexes mean that many of these unseasoned businesses end up populating the small-cap indexes. Note how the IPO volume pattern ties closely to the three capital market cycles of the dot-com, housing and what we are referring to as the bond market bubbles. To get the full picture of equity capital flows, we also include secondary follow-on offerings,[6] many of which are from these same recently IPOed companies, as few generate free cash flow.

[6]Over the last 20 years, 82% of total IPO proceeds and 87% of all secondary market proceeds were from companies with market caps of less than $3 billion.

FIGURE 7. ACTIVE MANAGERS HAVE FALLEN SHORT AS BUBBLES FORMED
As of December 31, 2016



Time Period	1/96 – 2/00 Dot-Com Bubble	3/00 – 9/02 Bubble Burst	10/02 – 5/07 Housing Bubble	6/07 – 2/09 Bubble Burst	3/09 – 12/16 Bond Yield Bubble	1/96 – 12/16 Total Period*
R 2000 Performance	+93.1%	-35.1%	+147.3%	-52.9%	+289%	+468.2%
% of Active Small Cap Blend Managers that Outperformed the R 2000	24%	88%	18%	53%	21%	50%

Source: Jeffries, Bloomberg, Morningstar.
Note: Analysis was performed using all actively managed funds within Morningstar's Small Cap Blend Category. Funds that have merged or went out of existence were included in the analysis to minimize the potential for survivorship bias.
*Total Period active performance includes only funds in existence for the entire time period.

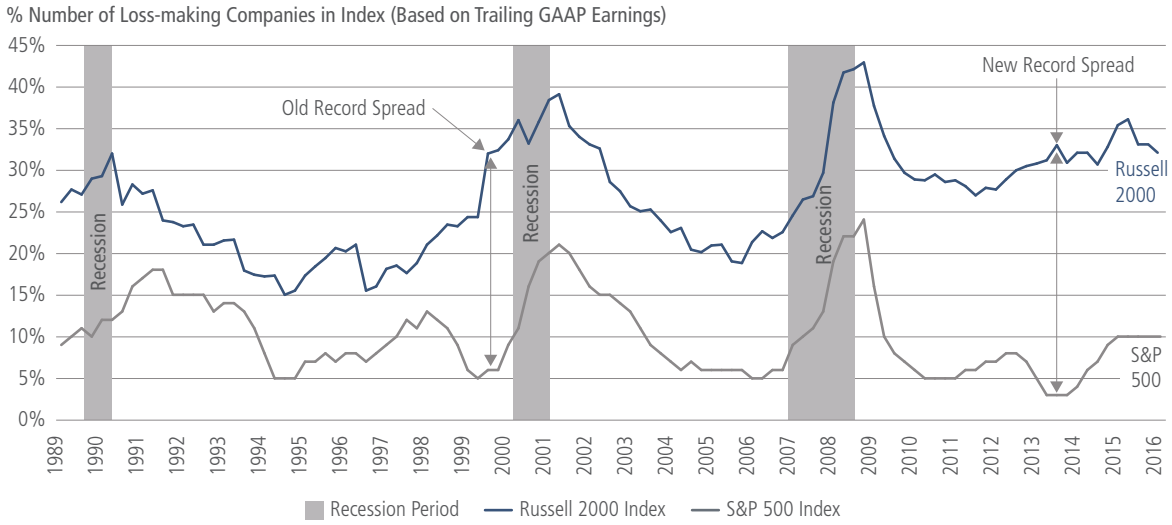
The relative performance of small-cap active core managers for each of these periods is indicated in the bottom row of the table in Figure 7. Note the extremely poor showing of active managers during each of these bubbles in contrast with their cumulative performance for the total period. The magnitude of active manager underperformance in these capital markets is startling; statistically speaking, the 50% outperforming, 50% underperforming mix we see for the full measurement period is much closer to what one might expect.[7] Are newer, riskier entrants to the index behind this phenomenon?

Active managers typically include some sort of fundamental judgment of a stock's quality in their portfolio construction process, and thus are less inclined to embrace the riskier components of the small-cap index—including newly minted IPOs—relative to their weighting. As such, they tend to underperform the index during easing cycles. Once the cycles reverse, however, active managers tend to outperform, as Figure 7 demonstrates. For example, while tech and telecom stocks rose to a 40% weighting in the Russell 2000 during the dot-com bubble, the average active small-cap manager held at maximum a 20% weighting to these sectors. This position hurt active managers during the bubble, but benefited them when it burst.

At a high level, one approach to analyzing the ebb and flow of risk in the small indexes is to track the number of companies and weightings in the index reporting losses and compare these percentages to the S&P 500 over time. Certainly there are cyclical reasons to expect this ratio to fluctuate. Figure 8 compares the percentage of money-losing companies in the Russell 2000 and the S&P 500 over the last 35 years. Recessions are shaded in grey. The influence of the economic cycle is clearly evident. In subsequent recoveries, the percentage of money-losing companies drops sharply in the S&P 500. However, while the percentage of money-losing companies also declines in the Russell 2000, there is an unmistakable pattern of higher lows and higher highs for the small-cap index.

[7]Not shown in Figure 7 is the interesting fact that active small-cap growth and small-cap value managers also outperformed passive alternatives for the total period at about a 50% rate.

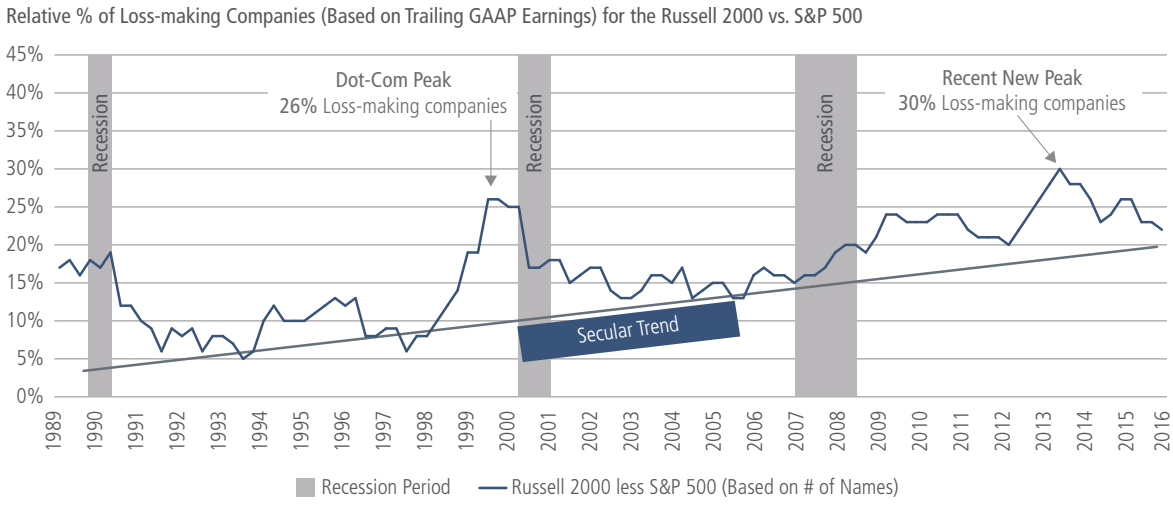
FIGURE 8. A SIGNIFICANT NUMBER OF RUSSELL 2000 COMPANIES LOSE MONEY
As of December 31, 2016



Source: Furey Research Partners, FactSet.
Note: The % of loss-making companies is calculated by determining the number of benchmark holdings that have negative trailing GAAP earnings and dividing that total by the total number of names in the overall benchmark. This information is calculated for both the Russell 2000 and the S&P 500 on a quarterly basis.

This secular trend becomes more evident in the difference between these two charts, shown in Figure 9. As you can see, the relative percentage of money-losing companies in the Russell 2000 recently eclipsed the peak of the dot-com mania, the acknowledged gold standard for speculation. The common link between the dot-com bubble and the current environment is aggressive central bank liquidity policies that prompted a spike in IPO activity (as well as secondary offerings by many of the same companies) that then populated the small-cap benchmarks.

FIGURE 9. THE RATIO OF LOSS-MAKING COMPANIES IN THE RUSSELL 2000 VS. THE S&P 500 IS TRENDING HIGHER
As of December 31, 2016



Source: Furey Research Partners, FactSet.
Note: The % of loss-making companies is calculated by determining the number of benchmark holdings that have negative trailing GAAP earnings and dividing that total by the total number of names in the overall benchmark. This information is calculated for both the Russell 2000 and the S&P 500 on a quarterly basis over time.

In the dot-com era, many of these companies were internet startups with minimal revenues and in most cases, no earnings. In the current cycle, many small-cap biotech startups have gone public and are populating the index. The vast majority of these companies have no revenues or earnings as they are mired in the approval process with the Food and Drug Administration, a very time-consuming and expensive endeavor.

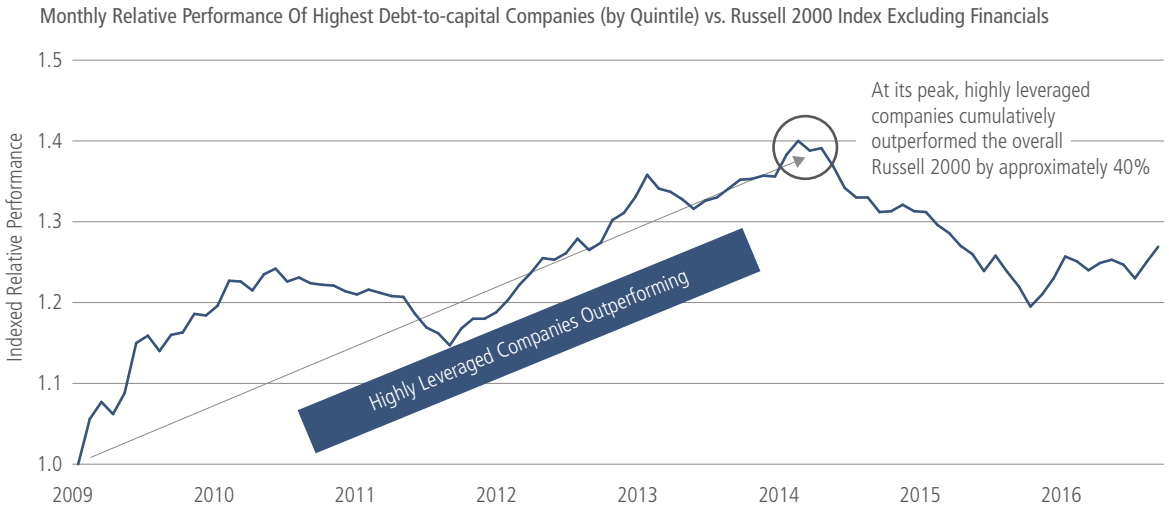
When capital market conditions changed in the dot-com cycle and became more discerning, or even outright hostile, the vast majority of these small internet companies collapsed. Will today's equivalent suffer a similar fate? More important, do passive small-cap investors even understand the degree to which they are financing this effort, with roughly one-quarter of passive index investment dollars flowing into these very money-losing companies?

THE HIGH YIELD MARKET AND THE CAPITAL MARKET CYCLE

We include a brief review of the high yield and leveraged loan markets, as these credit markets are often a source of long-term debt financing for small caps. It's important to note that as of December 31, 2016, only 9% of the market value of the Russell 2000 enjoys an investment grade rating versus roughly 91% of the S&P 500, and as a result most small caps are not able to access 30-year bonds. Therefore, smaller companies have tended to utilize credit at the short end of the curve and typically turn to the long end by tapping the high yield market. In fact, companies with less than $3 billion in market cap account for roughly half of all high yield financing and roughly two-thirds of all leveraged loan financing over the past 20 years.

Clearly, IPOs are not the only source of risk fluctuation in the popular small-cap benchmarks; the sensitivity to interest rate changes serves as yet another element of elevated risk for small companies versus large. As interest rates fall, leveraged business models outperform, as shown in Figure 10, due to their ability to refinance and/or ride the wave of falling interest expense.

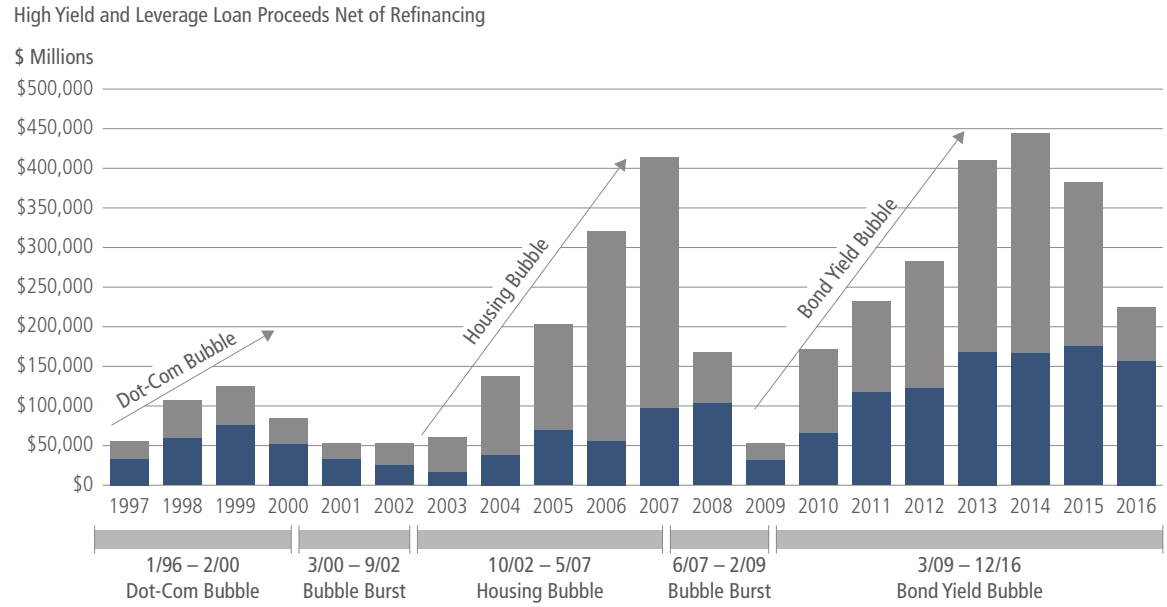
FIGURE 10. LEVERAGED BUSINESS MODELS OUTPERFORMED IN LOW-RATE ENVIRONMENT
As of December 31, 2016



Source: Bloomberg, Russell Investment Group.
Note: Russell 2000 excluding any company classified as financials under GICS classification.

The dominant small-cap credit markets show an alarmingly similar pattern that mirrors the same cycles of central bank largesse. Similar to an earlier chart that depicted equity capital flows, Figure 11 shows the behavior of high yield and leveraged loan issuance over the past 20 years. Once again, the three central bank liquidity cycles are clear.

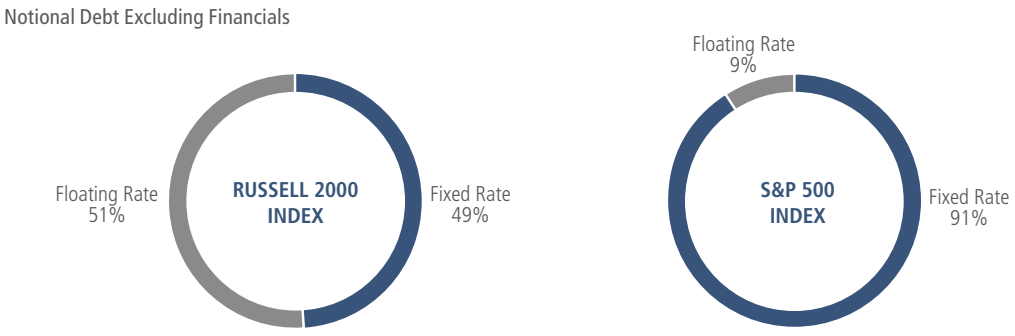
FIGURE 11. HIGH YIELD AND LEVERAGED LOAN ISSUANCE TRACK EQUITY OFFERING PROCEEDS
As of December 31, 2016



Source: Bloomberg.
Note: Graph represents all small-cap (< $3 billion in market capitalization) high yield and leveraged loan issuance net of refinancing.

However, the leverage that helped fuel outsized gains for certain smaller companies leaves them much more exposed to rising interest rates than large-cap stocks in general, largely due to the composition of their debt profiles and the nature of their debt market access. As you can see in Figure 12, the notional debt outstanding for Russell 2000 companies is nearly evenly split between fixed-rate and floating-rate debt, compared to the S&P 500's almost total concentration in fixed-rate debt. Even this doesn't fully capture the exposure of the smaller index to rising rates, as swaps often are used to transform floating-rate debt into fixed-rate debt on a firm's balance sheet.

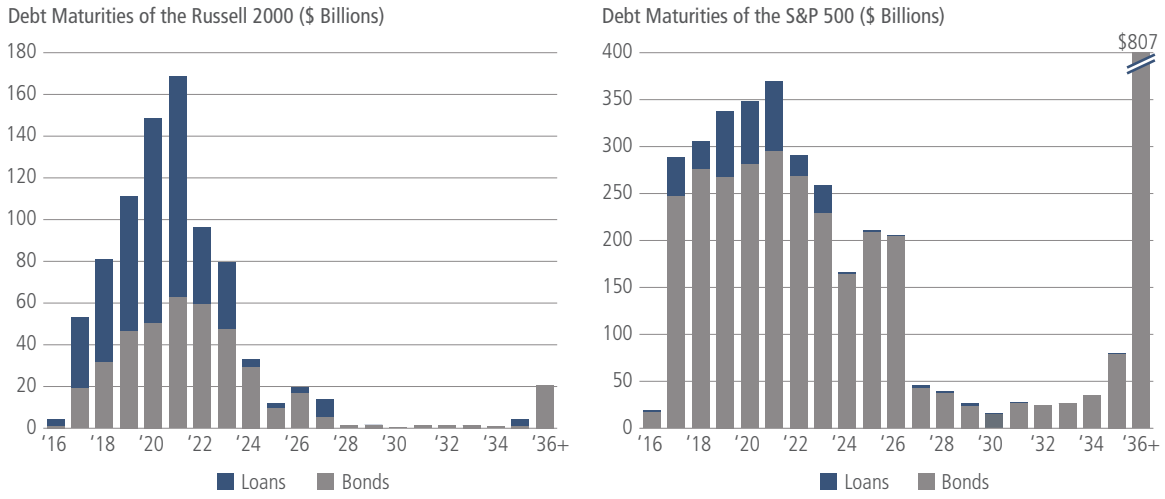
FIGURE 12. SMALL CAPS APPEAR TO BE MUCH MORE EXPOSED TO RISING INTEREST RATES
As of December 31, 2016



Source: Bloomberg.
Note: Fixed-rate debt is defined as bonds; floating-rate debt represents loans and/or drawn revolvers.

Figure 13 demonstrates that small-cap debt maturities are clustered in the five-year range and include a much higher proportion of bank loans versus bonds relative to larger companies. As the last credit cycle demonstrated, bank lending terms and conditions can tighten dramatically and with little warning—and usually at the worst possible time for the borrower.

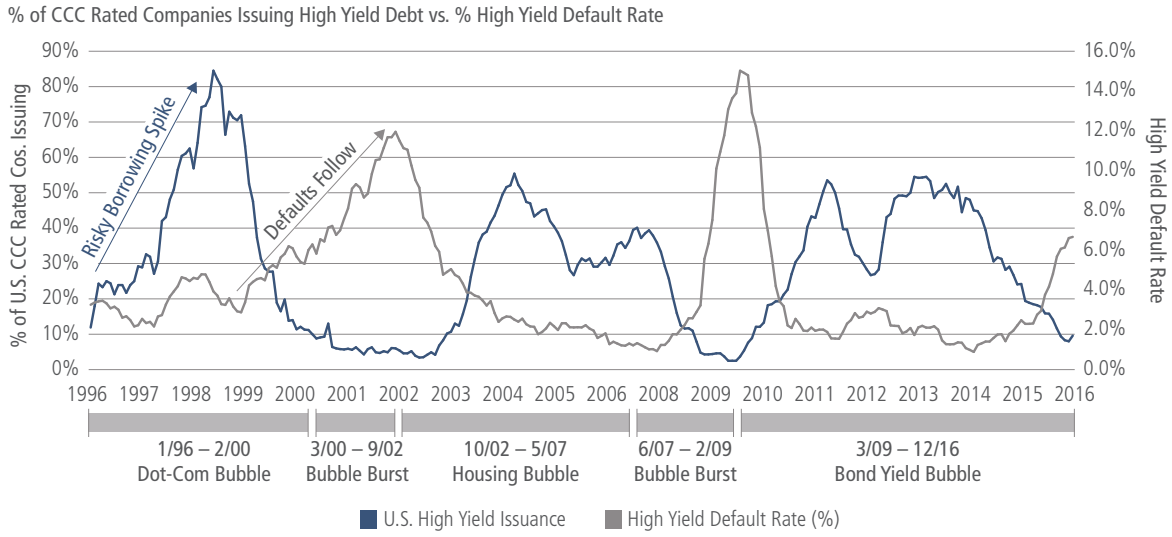
FIGURE 13. SMALLER COMPANIES HAVE NOT LOCKED IN FINANCING COSTS TO THE EXTENT OF THEIR LARGE-CAP PEERS
As of December 31, 2016



Source: Bloomberg.
Note: Based on notional debt excluding financials. Information reflects all bonds outstanding regardless of maturity. Hedges are not included in this analysis.

One approach to analyzing the ebb and flow of risk in the high yield markets is to track the percentage of CCC issuers tapping the high yield market. The vast majority of CCC issuers are smaller companies. As shown in Figure 14, the riskiest rung of the high yield market rushes to issue debt during these capital market cycles. Note how these peaks align with the spikes in money-losing weightings in the small-cap equity markets, which in turn align with the three major central bank easing cycles of the last two decades. Also, note how defaults follow these financing cycles with great regularity.

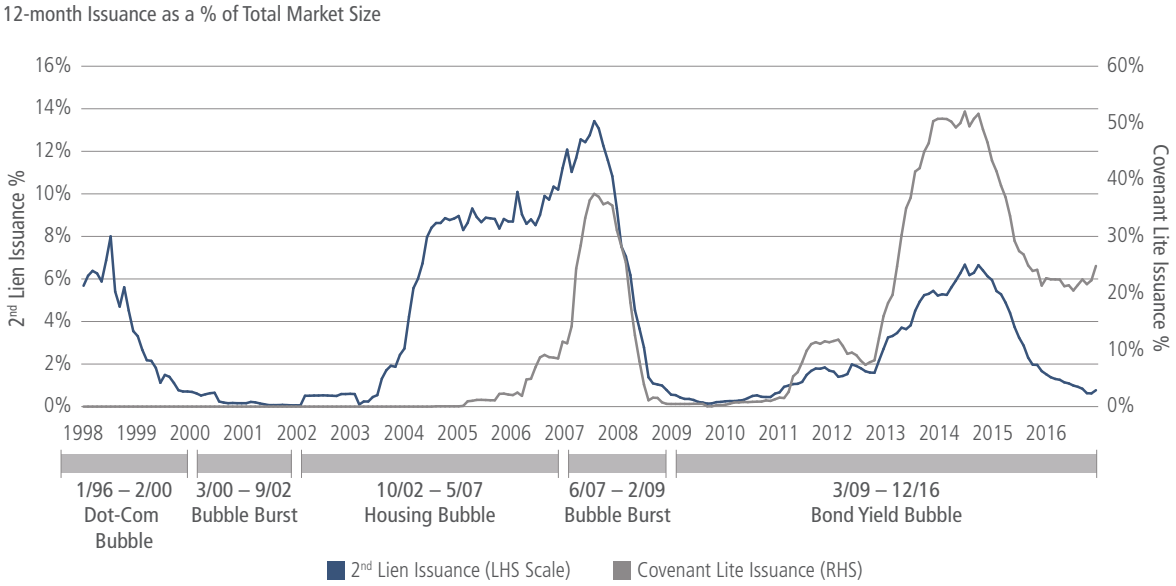
FIGURE 14. HIGH YIELD DEFAULTS INCREASE FOLLOWING A SURGE IN CCC RATED ISSUANCE
As of December 31, 2016



Source: Bloomberg.
Note: U.S.-domiciled issuers only. Represents the % of CCC rated issuers that are tapping the primary market and their default rate.

Increasing lending risk in the leveraged loan market can be seen in Figure 15, which depicts the ebb and flow of risk by showing the percentage of leveraged loan issuance that is second lien and "covenant lite." This too aligns with the central bank easing cycles that are apparent in the high yield and small-cap equity markets.

FIGURE 15. RISKINESS RISES DURING FINANCING CYCLE IN THE LEVERAGED LOAN MARKET
As of December 31, 2016



Source: Bloomberg.
Note: A second-lien loan is a type of loan that has a second-level priority to the rights of more senior debt issued against the same collateral. If a borrower defaults, second-lien debt stands behind first-lien debt in terms of rights to collect proceeds from the underlying collateral.

To summarize, the riskiest spectrum of borrowers sell the most debt on terms most favorable for the borrower during periods of aggressive central bank easing. This credit market behavior compounds the equity market risks shown earlier. To the extent active managers don't embrace these credit and equity market risk cycles, they tend to lag an index that does so mechanically. Of course, the passive investor is essentially guaranteed to participate fully in these violent ebbs and flows of risk, as the momentum-like tendencies of passive investing ensures the high yield index or ETF owner will have maximum exposure to these credit risk cycles at their peak. Ironically, the passive investor is helping to self-finance future underperformance by supplying excessive capital—at the wrong time and on liberal terms to largely undeserving business models. This, of course, is happening in the small-cap equity markets at roughly the same time for the same reason.

A FEW LARGE-CAP OBSERVATIONS

While the focus of this study was on the small-cap market, there are interesting similarities in active manager performance cycles in the large-cap market. Large-cap active managers, for example, struggle over the same time periods as their small-cap peers (see Figure 16). While the large-cap markets are not materially influenced by IPO activity, it is quite possible that long-duration large-cap equities are repriced upward during these easing cycles. (Think about the "FANG" stocks—Facebook, Amazon, Netflix and Google—as examples of rapidly growing companies with long-duration cash flows.)

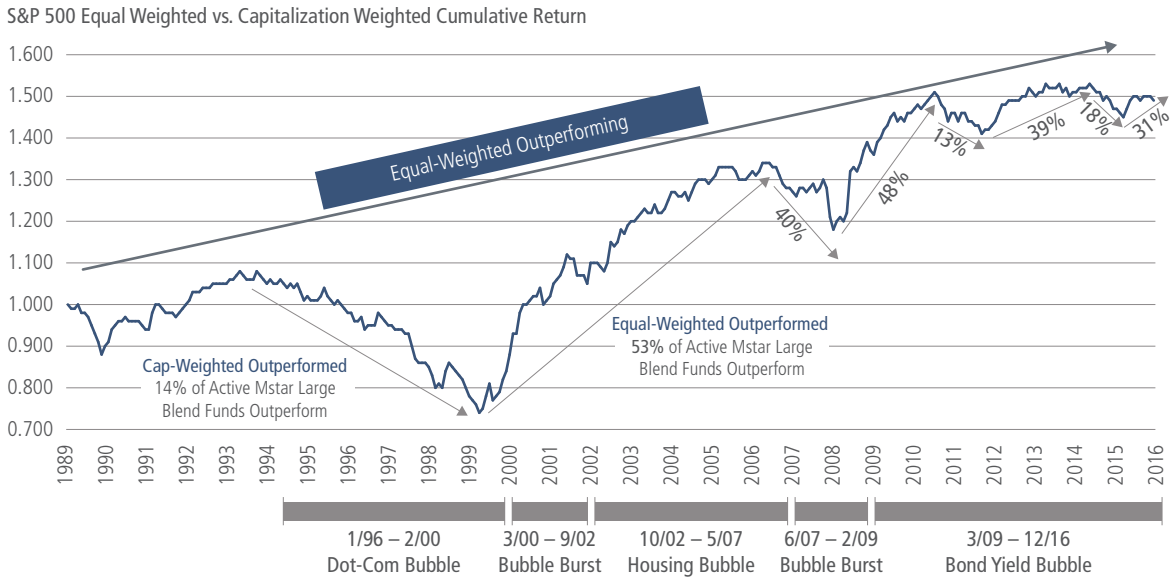
FIGURE 16. LARGE-CAP ACTIVE MANAGERS APPEAR TO STRUGGLE IN THE SAME TIME PERIODS AS THEIR SMALL-CAP PEERS
As of December 31, 2016

Time Period	1/96 – 2/00 Dot-Com Bubble	3/00 – 9/02 Bubble Burst	10/02 – 5/07 Housing Bubble	6/07 – 2/09 Bubble Burst	3/09 – 12/16 Bond Yield Bubble	1/96 – 12/16 Total Period
Russell 2000 Performance	+93.1%	-35.1%	+147.3%	-52.9%	+289.0%	+468.2%
% of Active Small Cap Blend Managers that Outperformed the Russell 2000*	**24%**	88%	**18%**	53%	**21%**	50%
S&P 500 Performance	+137.8%	-38.3%	+104.4%	-50.0%	+259.9%	440.2%
% of Active Large Cap Blend Managers that Outperformed the S&P 500	**21%**	56%	**35%**	52%	**10%**	35%

Source: Jefferies, Bloomberg, Morningstar.
Note: Analysis was performed using all actively managed funds within the respective Morningstar's Small Cap Blend and Active Large Cap Blend Categories. Funds that have merged or went out of existence were included in the analysis to minimize the potential for survivorship bias.
* Total Period active performance includes only funds in existence for the entire time period.

Another possible indicator of this phenomenon is the performance trend of active managers when the cap-weighted S&P 500 is outperforming the equal-weighted S&P 500. The equal-weighted S&P 500 has dramatically outperformed the cap-weighted index over the last 25 years, yet active managers struggle during periods when the cap-weighted index outperforms, as shown in Figure 17. Is this due to crowding into long duration securities in the index? We are not sure…

FIGURE 17. LARGE-CAP MANAGERS STRUGGLE WHEN CAP-WEIGHTED RETURNS OUTPACE EQUAL-WEIGHTED RETURNS
As of December 31, 2016



Source: Jefferies, Standard & Poor's, FactSet.
Note: Analysis was performed using all actively managed funds within Morningstar's Large Cap Blend Category. Hybrid vehicles such as DFA were eliminated from the active pool. Funds that have merged or went out of existence were included in the analysis to minimize the potential for survivorship bias.

WHY CAN'T INTEREST RATES STAY LOW FOREVER?

Theoretically, they can. In fact, their persistence at current low levels is unprecedented and likely longer than many expected. That said, abnormally low interest rates create significant economic problems that only get worse over time, suggesting to us policies that tamp down rates are not sustainable.

In a persistent low interest rate environment:

- Undeserving businesses access cheap capital, lowering the pricing structure or returns available to deserving businesses in the process.
- The markets don't clear and excess capacity becomes chronic, depressing overall economic growth.
- Long-term financial commitments—such as pension obligations, certain life insurance contracts, etc.—cannot be kept.
- Banks can't earn sufficient spreads to justify the risk of lending to the private sector and tend to prefer to lend to "lower-risk" government bonds (which they have been doing for some time), crowding out more efficient uses of capital.
- Savers tend to save more during periods of very low rates as interest and dividend income streams contract (look to spikes in home safe purchases in countries with negative interest rates for evidence), which in turn depresses overall demand.

That said, interest rates don't need to rise in order to stem the outperformance of leveraged business models; they just need to stop falling. The refinancing tailwind to leveraged companies is ending just as the headwind to unleveraged companies is ending. The company with no debt and net cash is earning close to zero on that cash—virtually any redeployment of cash will be, by definition, accretive to earnings, suggesting substantial untapped earnings power.

As we discussed earlier, given the fact that more than 90% of passive small-cap vehicles take a market-cap weighted approach to portfolio construction, money flows—and not business fundamentals—have been the primary driver of asset pricing in recent years. This is not capitalism, however, and we believe that ultimately the most deserving business models will again attract capital at the expense of the less deserving ones. We'd caution against trying to time this transition back to higher-quality investments. History—notably the dot-com mania of the late 1990s and the housing downturn more recently—has shown these shifts, often prompted by adjustments to monetary policy, can be abrupt and forceful. Very few investors negotiate such changes well.

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