Abstract and Introduction

In the aftermath of the global financial crisis, many of the world’s largest central banks have pursued highly accommodative monetary policies and unprecedented liquidity support of capital markets. As a result, many investors and reserve institutions now face the lingering prospect of negative real yields on bank deposits, money market instruments and conventional fixed income investments. Indeed, the traditional notion of “safe” assets has been fundamentally altered. For many savers and investors, a likely outcome of high allocations to fixed income assets will be a steady transfer of wealth to borrowers.

The historic lows in interest rates and fragile investor sentiment are conspiring to intensify liability funding shortfalls for a broad array of financial institutions, pension funds and other reserve investment pools, in both the private and public sectors. As the ensuing quest for yield has steadily progressed to the more eclectic corners of credit markets and alternative asset classes, it has also had an impact on relative valuations in segments of the global equity markets.

While investor sentiment remains tenuous regarding global equities in general, rising attention has been seen among various defensively-oriented and algorithmic “smart beta” strategies that seek to deliver the equity risk premium in a less volatile fashion. In this paper, we offer a different perspective to equity volatility anomalies and demonstrate the importance of valuation dispersion as a means to capture and exploit equity risk premia.

Our research suggests that some of the newly popularized risk-mitigation strategies are prone to disappointment, simply by virtue of high relative valuations and correlation breakdowns — the hallmarks of crowded trades. We infer that many perpetually defensive equity strategies are likely to fall short in delivering the coveted equity risk premia. In turn, we explore more dynamic strategies, where valuation-dispersion analysis can be used to identify market segments and factor risks most likely to deliver robust risk-adjusted returns across global markets and at different stages of market cycles. While we concur that volatility anomalies can indeed be exploited, we would stipulate that such strategies must be grounded in a valuation discipline that balances downside protection and upside participation. As a result, we recommend active equity strategies with opportunistic management of volatility and other anomalies, particularly for investors who are seeking to achieve high equity risk premiums through active management, but with greater downside risk control than the broad market average.

1The views expressed herein are those of the authors, and may not reflect those of the Principal Financial Group, its affiliates, and subsidiaries
Common Misperceptions

In comparison to the negative real interest rates on asset classes historically deemed “safe” investments, the incremental risk premia available in global equities suggest an appealing relative-value position. Nonetheless, many investors remain wary of equity markets because of their high levels of relative volatility, even though equity markets will likely provide higher absolute returns than other asset classes over time. That is a valid and rational concern. Although equity market volatility has declined considerably from its apex during the global financial crisis, it seems inevitable that volatility will increase from recently subdued levels. Therefore, a thorough understanding of volatility characteristics and drivers of individual stocks, and the overall market can provide the foundation of sound active investment strategies to manage volatility.

To understand how to address the role of volatility in global equity investing, one must first understand the underlying forces and drivers of equity volatility. We begin with the simple recognition that volatility levels vary significantly among stocks, and that there are important insights about investor behavior to be derived from studying the differences between low-volatility stocks and high-volatility stocks over time. At the most basic level, we begin with a group of the largest 2,500 companies in the global universe (derived from the S&P Global Broad Market Index). We then examine the returns of these stocks through the lens of volatility by utilizing returns from 1990 until the present. We divide this group of stocks into quintiles based on the 12-month historical volatility of the return series, ordering the groups from lowest volatility to highest.

By compounding the monthly returns over time, we can create Exhibit 1. Note the marked discrepancy between compounded returns for the highest tiers and the lowest tiers. A good deal of research has been published on this discrepancy in recent years, and the phenomenon has been tagged with the epithet “the low-volatility anomaly.” Though, what the data shows in Exhibit 1 is that the “anomaly” is really with the high volatility groups. Standing in sharp contrast to the logic that more risk (i.e., more volatility) should reward the investor with more return, Exhibit 1 demonstrates that the highest-volatility quintiles have delivered the lowest compounded returns over time. Why? Simply put, among high-flying “glamour stocks,” the Street is littered with many losers for every big winner.

EXHIBIT 1: COMPOUND RETURN BY VOLATILITY TIER

\[^2\text{Our conclusions and results do not change with varying volatility definitions.}\n\[^3\text{See references.}\]
Fundamental Factors Underlying Volatility Anomalies

Our research then set about to determine some of the root causes of this observed volatility anomaly. We determined that what has been coined a volatility anomaly is, in reality, tied to changes in future growth expectations, and hence, is a growth anomaly.

To examine this, we divided the same universe of 2,500 stocks into percentiles; again, using the same data from 1990 until present. The percentiles divided the stocks from lowest volatility to highest. Next, we contrasted the trailing three-year sales growth for this group of stocks. Arrayed in Exhibit 2 by volatility percentile on the x-axis, it can be seen that the three-year historical sales growth is related to volatility, with the highest-volatility stocks displaying the highest trailing three-year sales growth. The reason for this is relatively simple. Volatility is caused by the divergence in opinions of market participants over growth expectations. Volatility is also caused by changes in the expected timing and amount of future cash flows. To demonstrate the concept, a traditional bond provides the simplest example. Contrasting a 2-year bond and a 30-year bond, each has a stream of expected cash flows. The majority of cash flows for the 30-year bond are received further in the future than those of the 2-year bond, and are more variable because of the impact of future interest rates. Therefore, you are likely to see more variability in the price of the 30-year bond today than in that price of the 2-year bond. The bond duration concept is analogous with equities; however, equities have the additional capacity and uncertainty for future growth.

A stock’s volatility will likely increase, the further in the future that growth is expected and the more uncertainty and cyclicity attributed to these growth prospects. Pushing expected growth into the future reduces the certainty of both the amount and timing of the expected cash flows related to that growth. For example, a stock’s valuation obtained by a typical dividend-discount model output would be subject to high degree of variation because of the small changes in growth rate assumptions when the growth-rate expectations are high and placed further into the future. As a result, more uncertainty in future cash flows and earnings growth translates into present-value volatility.
To demonstrate this, we continue with our percentile volatility-ranked group of stocks and compare the trailing three-year earnings-per-share (EPS) growth and the forward one-year EPS growth. Exhibit 3 shows that higher-volatility stocks are associated with higher future earnings-growth expectations (i.e., those with more variable cash flows arriving in the future), which translates into more volatility of a stock’s returns in the near term. Any changes in the expectations for that future earnings growth—even small changes—can have magnified effects on the current valuations of an equity security.

Exhibit 3 also demonstrates the quixotic behavior of many sell-side Wall Street analysts. For almost every comparison, not only has the three-year historical earnings growth been high, but the consensus average predicted future growth (i.e., forward one-year EPS growth) is also higher than the realized growth (i.e., trailing three-year). This suggests that sell-side analysts continue to expect this historical growth to accelerate at an even higher pace than in the past. Rationally examining the data displayed in Exhibit 3 illustrates the unrealistic expectations of many market participants. For the highest-volatility groups, expected EPS growth is near or in excess of 20%. This represents a sub-group of less than 200 companies that are expected to grow at 20% for an extended period of time. We argue that even in new industries, where such growth is feasible, investors systematically tend to underestimate the degree to which competitive forces take hold to seize that growth.
Looking further into the relationship between volatility and expected growth, our research also determined that, in these high-volatility stocks, expected growth was oftentimes being purchased at premium valuations. That is to say, investors were overpaying for the ethereal commodity of growth.

When the anticipated growth is not realized, particularly among stocks with the highest recent growth (and therefore the highest extrapolated future growth expectations) disappointment follows—especially when these growth stocks are priced at a premium. Exhibit 4 highlights that the average earning yield (the inverse of P/E ratio) of these high-volatility and high-expectation stocks is also low. This indicates that investors are willing to pay a premium for these growth stories, which are likely to disappoint. In turn, this disappointment creates stock-price volatility and likely underperformance. This high-growth anomaly has been researched extensively by academics and practitioners under that “glamor stock” behavioral anomaly, but not fully linked to the volatility anomaly as we suggest above.

EXHIBIT 4: FORWARD EARNINGS/PRICE
Looking at the subject from another perspective, Exhibit 5 shows the differences between profitability and potential. Using the same data over the same time period, Exhibit 5 portrays the realized return on equity (ROE) and the standard deviation of ROE (i.e., profit variability), ranked by percentile from low to high. The ROEs of the typically low-volatility stocks were higher, relative to the ROEs for their high-volatility counterparts. The reason is straightforward; these high-volatility companies tend to reinvest a significant portion of their earnings back into the business. Even if a business shows clear signs of slowing or negative growth, many previously fast-growing companies still seem compelled to plow earnings back into the business. By contrast, a majority of companies in the low-volatility percentiles tend toward paying earnings out to investors. This represents a source of relatively dependable income, which the investors can use to more reliably value the stock using discounted cash flow models. Not only did low-volatility stocks provide greater ROEs, but also a lower level of ROE volatility. Conversely, high-volatility stocks provided a relatively lower level of ROE and a far greater amount of volatility in the process.

**EXHIBIT 5: REALIZED ROE & ROE VARIABILITY**

*Expectations For Growth Versus Reality*

The tenuous and romanticized expectations for growth can be revealed by looking at the mobile phone industry over the last decade. Ten years ago, the consensus was that the mobile phone industry was going to be a very rapid-growth industry for some time. With 35% to 40% market share, Nokia was a luminary in the mobile phone business.

Expectations for an industry leader were for continued growth built on their strengths. At the time, Nokia, of course, claimed to be seeking more market share to capture that growth. That same growth, though, attracted new capital, and companies that were not established players in mobile phones (e.g., Apple and Samsung) are now the dominant forces in what has transformed from a “mobile phone” market into a “smart phone” market. Anyone investing in Nokia 10 years ago would have done so based on their expectations for promised growth, only to see that growth disappear because of the disruptive force of competition. These changing growth expectations resulted in sharp capital losses for Nokia investors in the last 10 years.
The Math Is Simple – Protect On The Downside

Our research pointed at one concept that was fundamental to understanding equity volatility and profiting from it—the importance of not underperforming in down markets. To illustrate this concept, we created three basic scenarios (see Exhibit 6): the low-volatility scenario, the benchmark scenario and the high-volatility scenario. The chart illustrates a series of twelve returns; the data at the bottom of the exhibit contains statistics calculated off of each return series. Each of the three groups has exactly the same average monthly return, indicating that the skill in the return-generating process is the same. However, by compounding those returns over time, it can be seen that the low-volatility scenario provides the highest compounded return. This is simply attributable to the inclusion of periods of negative returns. The low-volatility scenario protects on the downside and is less negative in each of these four periods, while the high-volatility scenario is more negative than the benchmark. Relatedly, in each period where the benchmark return is positive, the low-volatility scenario has a lower positive return and the high-volatility scenario has a greater positive return than the benchmark. And yet, the compounded return for the low-volatility scenario is 0.9% higher than the benchmark and 2.1% higher than the high-volatility scenario. This simple example proves the paramount importance of downside protection. Limiting the portfolio drawdowns by protecting capital is essential, helping ensure that the hurdle for upside participation of a portfolio is much lower. In other words, downside compounding is more detrimental than upside compounding is beneficial.

When asked what he considered the greatest invention in human history, Albert Einstein famously replied “compound interest.” He was right, but investors must nonetheless also recognize the importance of negative compounding. Simple math reminds us that a 50% loss of capital in a down market requires a subsequent 100% advance to get back to a break-even point. Many investors seem to forget the same concept applies when evaluating relative performance over time.

When asked what he considered the greatest invention in human history, Albert Einstein famously replied “compound interest.” He was right, but investors must nonetheless also recognize the importance of negative compounding. Simple math reminds us that a 50% loss of capital in a down market requires a subsequent 100% advance to get back to a break-even point. Many investors seem to forget the same concept applies when evaluating relative performance over time.

Notice, the high-volatility group has higher median returns, suggesting that investors are exposed to these higher returns more on average. This will likely create behavioral biases where investors “feel good” about their portfolio more often, but the large drawdowns that they realize at selloffs will cause underperformance in the long term.

Algebraically, a volatility correction, in the order of 0.5x standard deviation, can be applied to average returns to estimate compounded returns.
Implications For The Capital Asset Pricing Model

We extended our volatility research to examine the relationship between equity returns and predicted betas. If there is a volatility anomaly, should there also be a beta anomaly6? We used the same group of 2,500 companies and divided them into deciles, based upon their predicted betas. Then, we measured their performance over the next month and calculated the “implied” beta delivered for that month. Exhibit 7 details our empirical findings with performance data since 1990. Going further, we disaggregated the implied delivered beta information to examine betas in both up markets and down markets to determine how groups of stocks participated in each case7.

In the widely used capital asset pricing model (CAPM), historical beta is used to help predict returns, and returns are deemed to be proportionate to the beta that the company has in the relevant index. In Exhibit 7, the historical beta is the blue line, and represents the number that a typical CAPM framework would include to price a security. By including realized up-market and down-market betas into our example, we are able to determine any disparities between historical and realized beta that could distort the findings of a CAPM framework. What the data shows is that stocks in the highest-beta decile demonstrate a negative reversion profile where high betas revert to the mean during up markets. This means that realized up-market beta tends to be much lower than their historic beta for this group. However, high-beta stocks tend to realize their full beta potential in down markets. Simply, this disparity in realized betas in returns for high-beta stocks is not desirable because high-beta stocks get penalized fully in a down market, but they do not recover fully on a similar move on the upside; this suggests that investors are not fully compensated by the beta risks taken.

6Individual stock volatility is linked to stock beta through the correlation coefficient between market and the stock.
7We identified an “up market” if the equally weighted universe recorded a return greater than 0%.
For example, as Exhibit 7 demonstrates, investors purchasing high-beta stocks to participate in a market that is going higher will find a realized return lower than what would be predicted using the historical beta. The highest-beta stocks group at the far-right side—the tenth decile—and deliver a beta of about 1.2 in up markets as the returns of these stocks exceed market returns. However, these higher-beta stocks are massively underperforming their expectations on a risk-adjusted basis—delivering a beta of 1.2 versus expectations of 1.8. For this highest-beta decile, realized betas are approximately 30% lower than their expectations, suggesting that investors are not fully compensated for taking this additional risk.

However, down-market betas are much closer to their expectations, meaning that high-beta stocks will deliver almost the full effect of the expected beta in a down market. Thus, a high-beta portfolio realizes the full effect of a market downturn, but likely will not fully recover in an upturn; thereby, resulting in underperformance, especially in a low-return environment.

Exhibit 7 also shows that the historical beta of the lowest-beta group is near 0.4. The benefit of low-beta stocks is downside protection delivered by a low beta consistent with its expectations. However, in up markets, low-beta stocks tend to deliver a beta of over 0.6. This means that the lowest-beta group is delivering above its expectation and outperforming on a risk-adjusted basis despite recording an absolute return less than the benchmark. In other words, low-beta stocks provided systematic downside protection and better than expected risk-adjusted performance in up markets.

Similar to our base volatility analysis, in examining beta-revision tendencies, we find that the greatest informational value, or magnitude of anomalies, is found in the extremes—both the very highest and lowest beta tiers of the market—while beta works well for the majority of “average” stocks in the universe. In practical applications of this research, we have found, however, that exclusively focusing on this lowest-beta group, as a typical minimum-variance portfolio would tend to do, can lead to suboptimal results. Our experience has shown that stocks in this lowest-beta group can, at times, become very overvalued by the market. The stocks in this group tend to command premium valuations because of their relatively stable earnings, often accompanied with attractive dividend yields. As a result, these stocks often find appeal as bond proxies, particularly in periods of slow growth and low interest rates. Those may sound like highly desirable attributes in the current market environment, but unfortunately the weight of premium valuations can overwhelm, leading to surprisingly large shortfalls in relative total returns.
Exploiting Volatility Anomalies – Valuation Discipline

We have seen how low-volatility stocks can be used to enhance a portfolio’s returns through their relatively stronger compounded returns over time. Yet, we have also determined that because of this very trait, the stocks in this group tend to become occasionally overvalued. So, it becomes important to determine the value of this particular risk premium in order to know when to act upon it.

A proprietary system developed by Principal Global Equities allows us to do exactly this. Our Style Risk Monitor (SRM) allows us to identify various risk premia and how they are likely to trade over the next six to twelve months. The SRM gives us the ability to price these risk premia in a number of different ways by identifying valuation and correlation changes in key equity risk premia that have implications on future returns. Exhibit 8 demonstrates this, showing the correlation of low volatility with a number of different valuation factors. When the blue line is strongly above its average, our model indicates that low volatility is highly correlated with value, meaning lower-volatility stocks are relatively inexpensive compared to the overall market. When the line is below zero, it indicates that low volatility is negatively correlated to value, meaning that defensive stocks are priced at high premia to the overall market, hence, susceptible to underperformance. In this analysis, the most pertinent information is at the extremes (i.e., two standard deviations), rather than when the correlations are close to neutral (i.e., zero).

Exhibit 8 also shows that, from 1990 to the present, the market has been dominated by a “low volatility is cheap” scenario, particularly in the 1990s Internet-stock bubble. However, the market tends to start paying a premium for low-volatility stocks at times of crisis – for example, the 1998 Asian crisis and the bottom of Internet-stock bubble in 2002. Low-volatility stocks trading at a discount changed dramatically during the financial crisis in 2007 and 2008, when lower-volatility stocks saw greater demand, became more expensive, and investors began to pay a premium to own that lower volatility. Following the blue line, 2009 was a period where high volatility was very cheap, and correlations rallied to neutral (i.e., no difference in volatility, low or high, with regards to valuation). Late in 2011, when economic trouble began to surge in Europe, the correlation begins to move out again. Toward the end of 2011 and into 2012, the correlation narrowed, and more recently, low volatility became expensive again. So, as simple as Exhibit 8 is, it provides an important framework for determining how to price the volatility anomaly since the market appears to be moving to a different regime, where investors are willing to pay a premium for lower-volatility stocks.
More interestingly, we also analyzed how low-volatility stocks performed relative to high-volatility stocks over the subsequent 12 months, conditional on how they are priced. We divided the set into deciles to rank the results, which, as illustrated in Exhibit 9, highlight that although low-volatility stocks outperformed on average, outperformance is highly dependent upon how the stocks are priced. When our Style Risk Monitor observed that low volatility was at an extreme (top deciles) z-score, historical regression would suggest that investors could potentially face double-digit underperformance, relative to high volatility, over the subsequent 12-month period. That stands in contrast to the more typical outperformance of lower-volatility stocks in most market environments. The other extreme (bottom deciles) highlights how amplified the degree of outperformance can be among lower-volatility stocks, when also accompanied by very cheap relative valuations. This was exemplified by the outperformance of lower-volatility stocks from 2000 to 2002, following the collapse of the Internet-stock craze. In fact, as shown in Exhibit 10, low-volatility stocks outperformed high volatility stocks by 8.8% from 1990 to the present; however, from 2003 to the present, the outperformance is reduced to 3.5%, simply because of the elimination of the extremes seen during, and following, the 1990’s “dot com” bubble.

EXHIBIT 9: SUBSEQUENT 12 MONTH RETURN DIFFERENTIALS OF LOW VOLATILITY VERSUS HIGH VOLATILITY SORTED BY BEGINNING VALUATION Z-SCORE DECILE

When “defensive” becomes “expensive” underperformance typically follows
Outliers Dominated by aftermath of 1990s “Dot Com” bubble

EXHIBIT 10: CUMULATIVE OUTPERFORMANCE OF LOW VOLATILITY STOCKS RELATIVE TO HIGH VOLATILITY STOCKS
Expanding the Framework to Other Sources of Equity Risk Premia

We applied this valuation and correlation dispersion framework to evaluate other equity risk premia. Similar to earlier academic findings, such as Fama and French studies in the early 1990s, our research also indicates that equity investors earn positive risk premia in addition to simple one factor CAPM beta framework, but we also found that virtually all observed risk premia are quite dynamic over time. Specifically, equity investors can earn a risk premium significantly higher than its long-term average if the risk-factor exposure is purchased significantly cheaper than its historical average, and vice versa. In addition to volatility, we analyzed value, earnings surprise, liquidity, and price momentum as other key equity risk premia. Exhibit 11 below summarizes the long-term average premia observed comparing the average return differential between the best and worst deciles of each observed characteristic, based on our global study.

As noted, the summary results are not new insights. Rather our research focused on the dynamic nature of these risk premia, including several periods of sharp negative results at times, and specifically their relation to valuation dispersion.

To understand the valuation dispersion framework in its most basic sense, consider the measurement of value, or the variation of value premia over time. Measuring the “value of value” may sound complex, but it is a fairly straightforward concept. At any point in time, we can rank order a group of stocks from most expensive to least expensive, in this case, using book value-to-price as the differentiator. Then we compare the average book-to-price for the most expensive decile to the least expensive over time. Exhibit 12 below illustrates the dynamic nature of this relationship, wherein at times the differential between the groups is quite narrow; at other times, quite broad. Notice also the degree of variation apparent across regions.

---

We used price-to-book for value, estimate revisions for earnings surprise, market capitalization for size and liquidity, and 12-month price return for momentum factors. We also monitor different proxies and formulations for these risk premia, and our conclusions do not change.
We extended the framework to measure the observed performance differentials from the starting points of narrow observed spreads versus periods of wide observed spreads. As one might expect, the best performance differentials among the “cheap” group of stocks are seen when the beginning observed spreads are quite wide relative to history, and vice versa for periods of narrow and widening spreads.

We then extended this framework to the other observed risk premia such as size, momentum, and earnings surprise. In each instance, we find similar relationships of wide dispersion preceding high realized premia, and vice versa.

Among the risk factors we studied, among the most controversial is the nature of price momentum. Although the price-momentum factor is feared by some market participants, our research and the research of others confirm a positive excess-return profile on average over time. Therefore, the price-momentum factor should be a desired exposure for equity investors. However, how the price-momentum factor achieved those returns is a different story. When the stocks with the highest price momentum were most expensive versus the stocks with the lowest price momentum (decile 1), the subsequent (next 12 months) average return to price momentum was sharply negative in each instance. An investor exposed to this momentum factor would realize extreme drawdowns when there was significant valuation differentiation between the highest and lowest momentum stocks. In other words, when the market gets narrower, with a few stocks driving the outperformance in the market with extreme valuations, the next 12 months’ returns for these stocks has been very disappointing. However, price momentum can be a very effective factor if bought cheaply! As a result, the relevant question is “when” price momentum is a good risk exposure to own, not “if” it is a good exposure to own because of this conditionality of its pay-offs.
The power of this analysis comes to play when we shift this global analysis to regions, countries, and sectors to identify risk premia anomalies in local markets and sectors for more effective investing. We found that the same framework holds at the extremes, but that expected returns may differ based on the extent of the extremes each country or region faced over the time period analyzed. For example, in Exhibit 13, although momentum exposure has been an effective strategy on average for the United States and Europe, it had shown negative returns on average in Japan. However, consistent with our framework, having momentum exposure in Japan when momentum was extremely cheap had positive returns to momentum.

**EXHIBIT 13: AVERAGE RETURNS TO MOMENTUM 12 MONTHS FORWARD**

<table>
<thead>
<tr>
<th>Decile</th>
<th>Europe</th>
<th>U.S.</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-13.1</td>
<td>1 -19.2</td>
<td>1 -31.6</td>
</tr>
<tr>
<td>2</td>
<td>0.8</td>
<td>2 4.3</td>
<td>2 -5.3</td>
</tr>
<tr>
<td>3</td>
<td>4.4</td>
<td>3 -2.6</td>
<td>3 -1.8</td>
</tr>
<tr>
<td>4</td>
<td>6.6</td>
<td>4 -0.2</td>
<td>4 -0.7</td>
</tr>
<tr>
<td>5</td>
<td>7.8</td>
<td>5 1.9</td>
<td>5 -0.2</td>
</tr>
<tr>
<td>6</td>
<td>8.4</td>
<td>6 3.8</td>
<td>6  0.0</td>
</tr>
<tr>
<td>7</td>
<td>9.1</td>
<td>7 6.0</td>
<td>7 -0.1</td>
</tr>
<tr>
<td>8</td>
<td>9.8</td>
<td>8 8.0</td>
<td>8 -0.1</td>
</tr>
<tr>
<td>9</td>
<td>10.8</td>
<td>9 10.2</td>
<td>9  0.0</td>
</tr>
<tr>
<td>10</td>
<td>19.9</td>
<td>10 20.4</td>
<td>10 2.7</td>
</tr>
</tbody>
</table>

Similarly, these risk premia are also important to us since our portfolios represent positive intended exposures to these risk premia over time. As practitioners, we also recognized that the pay-offs to these factors differ from their long-term averages at times, but only it makes sense to make adjustments to portfolios at extreme readings when the expected returns to these risk premia are significantly different from the long-term averages. Once again, we emphasize this as a strategic tail-risk management tool since we observe similar tendencies for all risk premia. The only exception has been the size risk premium, where we did not find evidence that valuation dispersions between large- and small-cap stocks have predictive return consequences over the next 12 months over the sample period of our analysis.

To summarize, investors can identify risk premium anomalies across global markets with this framework and can earn higher returns to their risk exposures by strategically tilting their portfolios to benefit from risk premia extremes. We believe opportunistic and active portfolio managers can take advantage of these anomalies.

---

9The small-cap anomaly was identified in the early 1980s after stellar performance in the 1970s. Although we believe the same framework intuitively would work for small caps going forward, we have not documented it in our data, which did not cover the 1970s environment.
Conclusion

This conditional analysis of volatility is very important to ensure that investors recognize the benefits from the high-volatility anomaly in their portfolios. This conditional approach is more informative “at the tails” to protect portfolio returns from the tail risks of volatility. On average, exposure to low-volatility stocks is warranted in order to recognize the benefits of compounding and high-growth anomalies. However, during market extremes that drive volatility anomalies, the portfolio volatility should be actively managed to reflect the opportunity set observed in the market. For example, equity investors can collect additional risk premia by increasing volatility (and beta) of the portfolio towards market beta when the expected returns to low-volatility stocks are negative. This happens because low-volatility stocks are priced at a very high premium to highly volatile and cyclical counterparts (as observed in March 2009). On the other extreme (i.e., March 2000), when low volatility stocks are at a significant discount relative to highly volatile, cyclical stocks, equity investors will earn significant risk premia by further decreasing volatility of their portfolios. This approach is in contrast with algorithmic low-volatility approaches such as minimum variance or risk parity, which tend to always be defensive, irrespective of the opportunity set in the market, and could be detrimental to returns if investments in these algorithmic strategies are ill timed10.

As a result, we recommend active equity strategies that use opportunistic volatility management for consideration by investors who are seeking to achieve high equity risk premiums, but with greater downside risk control than the broad market average. Equity managers and investors that actively manage their portfolio volatility based on objective, systematic, repeatable risk premium criteria as above are likely to collect higher equity risk premia with lower volatility over a market cycle.

10An investment on March 1, 2009 in a minimum-variance strategy, which tends to run around 0.6 beta, would have lagged the market by around 26% over the next 12 months, during which time the market was up 65%.
References


About Principal Global Equities

Principal Global Equities, a specialized investment management group within Principal Global Investors, provides client-focused investment solutions spanning equity markets worldwide. We are fundamental investors focused on bottom-up stock selection within a sophisticated comparative framework. Our research universe encompasses over 10,000 companies, large and small, in emerging and developed markets. We provide expertise in active-core and specialty strategies, with risk profiles aligned to distinct client objectives and preferences.

All charts sourced/created based on internal research of Principal Global Equities.

The information in this document has been derived from sources believed to be accurate as of June 2013. Information derived from sources other than Principal Global Investors or its affiliates is believed to be reliable; however, we do not independently verify or guarantee its accuracy or validity.

The information in this document contains general information only on investment matters and should not be considered as a comprehensive statement on any matter and should not be relied upon as such. The general information it contains does not take account of any investor’s investment objectives, particular needs or financial situation, nor should it be relied upon in any way as a forecast or guarantee of future events regarding a particular investment or the markets in general. All expressions of opinion and predictions in this document are subject to change without notice.

Subject to any contrary provisions of applicable law, no company in the Principal Financial Group nor any of their employees or directors gives any warranty of reliability or accuracy nor accepts any responsibility arising in any other way (including by reason of negligence) for errors or omissions in this document.

All figures shown in this document are in U.S. dollars unless otherwise noted.

This document is issued in:
- The United States by Principal Global Investors, LLC, which is regulated by the U.S. Securities and Exchange Commission.
- The United Kingdom by Principal Global Investors (Europe) Limited, Level 4, 10 Gresham Street, London, EC2V 7JD, registered in England, No. 03819986, which has approved its contents, and which is authorised and regulated by the Financial Conduct Authority.
- Singapore by Principal Global Investors (Singapore) Limited (ACRA Reg. No. 199603735H), which is regulated by the Monetary Authority of Singapore. In Singapore this document is directed exclusively at institutional investors [as defined by the Securities and Futures Act (Chapter 289)].
- Hong Kong by Principal Global Investors (Hong Kong) Limited, which is regulated by the Securities and Futures Commission.
- Australia by Principal Global Investors (Australia) Limited (ABN 45 102 488 068, AFS Licence No. 225385), which is regulated by the Australian Securities and Investments Commission.
- This document is issued by Principal Global Investors LLC, a branch registered in the Dubai International Financial Centre and authorized by the Dubai Financial Services Authority as a representative office and is delivered on an individual basis to the recipient and should not be passed on or otherwise distributed by the recipient to any other person or organisation. This document is intended for sophisticated institutional investors only.

In the United Kingdom this document is directed exclusively at persons who are eligible counterparties or professional investors (as defined by the rules of the Financial Conduct Authority). In connection with its management of client portfolios, Principal Global Investors (Europe) Limited may delegate management authority to affiliates that are not authorised and regulated by the Financial Conduct Authority. In any such case, the client may not benefit from all the protections afforded by the rules and regulations enacted under the Financial Services and Markets Act 2000.

Principal Global Investors is not a Brazilian financial institution and is not licensed to and does not operate as a financial institution in Brazil. Nothing in this document is, and shall not be considered as, an offer of financial products or services in Brazil.

For a listing of our office locations, please visit www.principalglobal.com