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Multi-Asset Solutions that Go Beyond the Efficient Frontier
The relationship between expected returns and risk has eroded considerably over the past 25 years. Previously, investors could take on a moderate amount of risk and reasonably expect sufficient long-term returns to meet their goals. After a decade of advancing markets, high valuations across most asset classes mean future return expectations have fallen dramatically. Now, investors face a troubling dilemma: assume much greater levels of risk to achieve the same return or reduce risk at the expense of return.

Illustratively, in 1995, a portfolio invested 100% in high-quality bonds was expected to earn 7.5%. Ten years later, generating a 7.5% return required a significantly larger allocation to higher risk assets at the expense of bonds. Fast forward to 2018, a portfolio would need to rely on an unrealistically large allocation to private markets in order to achieve that same 7.5% return, while fixed income is completely absent from the allocation. The expected volatility of today’s portfolio is four times that of the simple 1995 portfolio. The expected return-to-risk ratio is 0.3, which is the same as the long-term realized Sharpe ratio of equities (see the chart on page six). Further, the future relationship between risk and reward will likely be very different from what investors enjoyed in 2017 and 2018 when volatility was unusually low. Fortunately, this analysis is not the last word. We believe investors can achieve their return objectives without taking on more risk; the key is to revisit the basics of Modern Portfolio Theory (MPT) and make the most of diversification.

The Changing Investment Environment

**PAST PERFORMANCE IS NOT NECESSARILY INDICATIVE OF FUTURE RESULTS.** Source: Callan Institute, June 2018. Expected returns based on Callan’s research and formulaic mix of asset classes.
Humble Beginnings: Modern Portfolio Theory

The classic financial framework of Modern Portfolio Theory expounded the benefits of diversification and leverage. MPT is best known for the “efficient frontier,” which plots the highest achievable expected return on the y-axis versus each level of portfolio volatility on the x-axis. Portfolios along the frontier are efficient in the sense that each delivers the highest level of return available from an unlevered portfolio at that level of risk. In other words, each portfolio maximizes the excess return over cash. A measure of risk efficiency, the Sharpe ratio, is calculated by dividing the expected return by the expected risk.

The efficient frontier tends to be concave, highlighting the diversifying aspect of a multi-asset portfolio. As stocks are added to an all-bond portfolio, the expected return increases but expected risk stays the same or may even decrease, so the Sharpe ratio increases. Past a certain point, any additional allocation to equities starts to overpower bonds and risk efficiency decreases. The point where risk efficiency is maximized is known as the maximum Sharpe ratio portfolio.

The maximum Sharpe ratio portfolio can be found at the intersection of the efficient frontier and the capital market line (CML), illustrated in dark blue in the figure below. Often referred to as the “optimal” portfolio, a portfolio of risky assets can be combined with cash to form the left half of the CML, or combined with leverage to form the right half of the CML. All the portfolios on the right half of the CML lie above the efficient frontier, with the optimal portfolio being the only portfolio common to both. Interestingly, the Levered Tangent Portfolio can provide the same return as a Traditional Multi-Asset portfolio on the efficient frontier but with a lower level of risk despite its leverage. The objective, therefore, is to build portfolios that seek to be on the right half of the CML for a given level of risk or expected return by prudently utilizing leverage.

Most investors feel comfortable taking implicit leverage, such as holding the stock of a company that issues debt. However, not all investors are completely comfortable with the idea of explicit leverage in their portfolios. As shown above, MPT demonstrates the benefits of explicit leverage—specifically leverage that is implemented effectively to achieve higher returns at similar or lower levels of risk relative to the range of asset mixes on the efficient frontier.
We believe investment strategies built on the foundation of MPT can potentially earn higher risk-adjusted returns. We have applied these concepts to three strategies, which each address different investor needs.

1. Dynamic US Equity (DUSE): A unique, multi-asset approach to delivering large cap equity alpha
2. Dynamic Growth: Seeks to generate a smoother total return profile through intelligent tactical decisions
3. Risk Parity: Risk-balanced methodology to achieving strategic asset allocation goals

**Dynamic US Equity: Modern Portfolio Theory In Practice**

Investors seeking excess returns in equity markets have been disappointed with the vast majority of traditional strategies. Higher fees, along with generally weak performance in an environment of low stock dispersion, has resulted in a massive shift to low-cost passive index products as well as factor-based and smart beta strategies.

Consistently extracting alpha is difficult in efficient markets such as US large cap. In 1989, we suggested a different investment approach that uses the more reliable characteristics of market structure articulated by MPT to generate performance above the S&P 500® Index. By simply combining three assets (stocks, bonds and cash) and relaxing constraints (allowing for the use of leverage and shorting), we believed a larger and consistent excess return could be achieved over the S&P 500 Index than was possible with traditional strategies.

Stocks, bonds and cash will likely reach equilibrium risk-return relationships over a sufficiently long period. However, the shape of the efficient frontier and the CML can change in the short run as markets price in future expectations. We attempt to compare the risk and return trade-offs for each combination of these assets to ultimately arrive at an optimal portfolio and an appropriate risk level along the CML. We allow the mix of stocks and bonds to fluctuate, and we also vary the leverage in order to respond to changing economic environments. A macroeconomic awareness adds an additional risk management layer.

We believe the strategy’s 30-year history bears testimony to efficacy of the theory underpinning MPT. The methodology can be extended to other large cap equity markets such as MSCI ACWI and MSCI ACWI ex-US, which tend to be efficient and where alpha generation continues to be challenging.

**Dynamic Growth: Expanding the Modern Portfolio Theory Universe**

Drawdowns are an inevitable aspect of investing, but the compounding effects of drawdowns can have a meaningfully adverse impact on long-term performance. While strategies that explicitly seek to minimize drawdowns may lag in very strong equity markets, they tend to outperform when equities fall. For this reason, it is critical to assess such strategies over a full market cycle that includes both bull and bear markets. The compounding effect of minimizing drawdowns has historically resulted in positive risk/return outcomes. In our view, Dynamic Growth is ideal for investors who have a high-return bias but at the same time do not want to be subjected to the massive gyrations that come with traditional risky assets.

We do not believe, however, that a volatility-managed portfolio has to sacrifice growth to achieve its objective. By applying MPT, Dynamic Growth actively allocates to global, directional risk premia (growth, defensive and real assets) based on fundamental valuations. Our allocation to growth assets allows the strategy to pursue its goal of
delivering equity-like returns, while incorporating defensive and diversifying assets serves to dampen volatility, structurally mitigate downside risk and aims to help improve risk-adjusted performance.

Similar to DUSE, Dynamic Growth uses proprietary expectations of return, volatility and correlation to identify and construct the most optimal portfolio. Dynamic Growth, however, utilizes a wider range of global assets and risk premia with the goal of generating a smoother return profile than equities. Each asset has to earn its place in the portfolio either by offering a higher return, lower risk or overall diversifying properties when added to the portfolio. Further, the strategy seeks to add uncorrelated sources of return through diversifying, market-neutral strategies such as active currency and commodity allocations. The strategy is highly tactical by design and may move into and out of markets, effectively re-calibrating the efficient frontier. Dynamic Growth also makes prudent use of leverage in order to move above the efficient frontier and onto the CML with the goal of providing the highest return per unit of risk.

To achieve lower-than-equity volatility and diversification, Dynamic Growth also encapsulates a holistic risk management approach. A critical element of the strategy is its proactive response to changing macroeconomic conditions. We continually assess our proprietary forward-looking expectations for the macro environment and leading economic indicators (LEIs). Economic regime shifts dictate broad exposures to growth and inflation factors; below shows how a range of assets behave in different economic regimes.

The Best Performing Assets in Economic Environments

- **Risk seeking market environments**
  - Growth assets
    - High return and risk profile
  - Includes:
    - Developed equity
    - EM equity
    - EM bond
    - High Yield

- **Risk averse market environments**
  - Defensive assets
    - Low return and volatility
  - Includes:
    - Government bonds
    - Investment grade
    - Options
    - Cash

- **All environments**
  - Opportunistic Assets
    - Market Neutral
  - Includes:
    - Currencies
    - Commodities

- **Inflationary environments**
  - Real assets
    - Inflation protection
  - Includes:
    - Energy, Agriculture, Metals
    - Inflation linked bonds
    - MLPs, REITs
    - Commodity sensitive equities

The chart above is for illustrative purposes only. At any particular time, the strategy may not be invested in all components in the above opportunity set. Such components are subject to change without notice.

During periods of heightened risk or uncertainty, we have the ability to tactically de-risk the portfolio to help mitigate the risk of large drawdowns. The strategy is also designed to efficiently manage tail risk through options. Further, we regularly run Dynamic Growth portfolios through a variety of stress and scenario tests, including extreme market movements, historical scenarios and “what if” cases such as the Greek debt crisis and the Brexit referendum. This generally helps us address any significant tail risks as we seek to dampen extreme drawdowns.

We believe there are many ways to think about de-risking a portfolio, and it does not have to be all or nothing when it comes to growth assets. Dynamic Growth’s unconstrained philosophy creates flexibility to allocate across global asset classes and risk premia in order to achieve a smoother return profile that does not come at the expense of growth.
**Risk Parity: Seeking Long-Term Efficient Outcomes**

As shown earlier, traditional approaches to achieving a targeted return can lead to an undiversified, illiquid and risky portfolio, with no exposure to fixed income—far from an ideal outcome. We believe Risk Parity is the best way to hold a truly diversified strategic portfolio and still earn a meaningful level of return in this environment.

In its simplest form, Risk Parity seeks to fully balance the return sources across asset classes. In practice, this means risk parity strategies have more fixed income and commodities than a traditional portfolio. The approach offers a more diversified risk allocation versus a US-dollar-based 60/40 portfolio where risk is concentrated in equities, as shown below. Unlevered Risk Parity portfolios may be attractive due to their high risk-adjusted returns and reduced concentration risk, but the nominal expected returns may be too low to meet an investor’s desired return. To address this concern, we scale our diversified Risk Parity portfolio along the CML using leverage to match an investor’s expected return. Leverage allows us to hold a more efficient portfolio because many of the most diversifying assets are low volatility. We think this allows the strategy to take less absolute risk in pursuit of a given target return.

**A 60/40 Portfolio’s Risk is Concentrated in Equities**

[Diagram showing asset allocation]

We start from the observation that the vast majority of assets have delivered similar risk-adjusted returns historically (as shown above left). This shouldn’t be surprising; it makes intuitive sense that, in equilibrium, investors would demand to be paid approximately the same return per unit of risk across asset classes. If investors expected something radically different, they would invest accordingly and drive prices to a point where rough parity again holds. Then to maximize diversification, an investor would hold equal risk exposure to each asset class. We also know there are economic cycles where growth and inflation can be any combination of high and low. Foregoing any predictive expertise, we map assets to their
regimes so that, within the portfolio, there is consistent exposure to the best-performing asset for each economic environment. Our Risk Parity strategies, by definition, take the middle-of-road approach as asset classes go in and out of favor and the economic backdrop evolves.

We constantly adjust our allocations as asset class risks change. Our Risk Parity strategy will typically increase the allocation to bonds during recessionary periods (when equity volatility rises significantly). Conversely, the strategy allocates more to equities during growth/moderate inflation periods (when equity volatility falls and bond volatility may rise). As a result, the Risk Parity strategy efficiently responds to different economic regimes by allocating to stocks, sovereign bonds, commodities and credit spreads.

We believe our Risk Parity strategies offer better risk-adjusted returns in the context of a strategic asset allocation. Further, finding the optimal portfolio on a balanced-risk basis and then adding modest leverage along the CML may allow investors to achieve their long-term stated return goals in a risk-efficient way.

**Solving the Investors’ Dilemma**
The strategies described above offer investors flexibility due to their dynamic approach to changing market environments. They each seek to provide investors with a different solution tailored to specific goals and risk/return preferences:

- **DUSE** offers an index-based multi-asset approach with a limited set of assets (US stocks, Treasury bonds and cash) that seeks to outperform the S&P 500 Index at the same level of risk.

- **Dynamic Growth** takes a valuation-centric approach toward a wide range of assets designed to generate equity-like returns over a full market cycle, while trying to increase diversification to smooth the return profile. Dynamic Growth, like DUSE, assumes that short-term mispricing in assets causes shifts in the efficient frontier and dynamically levered the optimal portfolio while capturing additional sources of risk premia.

- **Risk Parity**, in our view, is an optimal way to allocate risk in a longer-term strategic asset mix. It allocates to a broad set of assets using a balanced risk approach to avoid the unintended risk exposures concentrated in traditional asset allocations. Our Risk Parity strategy diversifies across time and across asset classes based on risk contributions and uses leverage to scale up returns for a given level of risk.

Investors do not always have to assume a higher level of risk for higher returns, nor do they have to sacrifice returns to achieve more consistent outcomes. We find identifying optimal portfolios that are truly diversified and then employing leverage to raise their expected returns is a fundamentally better way to achieve return targets. By focusing on diversification and prudent use of leverage, we believe these multi-asset strategies can help investors meet their risk-return targets by moving above the efficient frontier.

**Investment Options Across the Risk Spectrum**

<table>
<thead>
<tr>
<th>Traditional Asset Classes</th>
<th>Bond: 5% - 6%</th>
<th>60/40 Portfolio: 10%</th>
<th>Equities: 15%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Our Multi-Asset Strategies</strong></td>
<td><strong>Risk Parity (Unlevered): 4%</strong></td>
<td><strong>Risk Parity (Levered): 8% - 15%</strong></td>
<td><strong>Dynamic Growth: 7% - 10%</strong></td>
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<tr>
<td><strong>Dynamic US Equity:</strong> 15%</td>
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Percentages represent target volatility levels. Actual volatility may vary from the target volatility at any point in time. There can be no assurance that the strategies’ targets may be achieved. Targets are objectives, are provided for illustrative purposes, are subject to change and should not be construed as providing any assurance as to the results that may be realized in the future from investments in these Strategies.
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