Defined Contribution

December 2019

Target Retirement Annual Review

Fine-Tuning the Glidepath with a Focus on Inflation Protection

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STATE STREET GLOBAL ADVISORS

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Executive Summary

Each year, State Street Global Advisors conducts a comprehensive review of its target retirement strategies. The annual review process is driven by the Defined Contribution Investment Group (DCIG), which blends asset allocation expertise from State Street's Investment Solutions Group with defined contribution (DC) market insights from the Global Defined Contribution team. The review follows a consistent and transparent framework to reassess the capital market expectations and demographic assumptions that underpin the glidepath, while also evaluating new asset classes and investment themes for inclusion in the investor portfolios. The process is grounded in three key criteria: **desirability**, **suitability**[1] and **investability**.

Our process continues to be guided by the goal of improving outcomes for participants in light of compressed long-term capital market expectations. Rather than introduce changes that would materially change the risk profile of the strategy, our 2020 review sought to re-examine the efficiency of the existing portfolio in the context of participants' evolving investment objectives. Inflation is a key risk that must be addressed for savers — especially those entering retirement — but explicit allocations to inflation-sensitive asset classes may come at the expense of long-term expected returns.

The coming year poses a unique set of changes, as we will merge our 2015 Fund with the Target Retirement Income Fund and open the 2065 Fund for the next generation of retirement savers. Concurrent with these changing vintages, we plan to implement three enhancements to the glidepath that balance key risks participants face by fine-tuning our inflation protection allocation and improving return expectations for younger participants.

1 Focus on Wealth Accumulation and Protection Where and When It's Needed Most

To do this, we will be replacing commodities with additional international equity exposure (MSCI ACWI ex US IMI Index) early in the glidepath and then will re-establish commodities starting at age 60. The intended benefits of this approach are to:

- Increase global diversification for younger participants (42.5% of total equity) while providing higher expected returns in wealth accumulation years
- Provide more inflation-sensitive asset class exposure through commodities to participants at age 60 to reduce volatility via increased home bias (international equity will make up 40% of the equity allocation for participants entering retirement, unchanged from the current glidepath weight)
- Retain the diversification benefits of long government bond exposure for younger participants

2 Review Portfolio Efficiency, Lower Expected Risk

Here, we look to remove broad-based US TIPS exposure and reallocate to intermediate TIPS, with the intended benefits being to:

- Provide a comparable long-term return expectation and lower expected risk, with the additional benefit of a higher historical correlation to the Consumer Price Index (CPI), an aggregate measure of consumer goods and services commonly used for identifying periods of inflation or deflation
- Reduce interest rate risk

3 Increase Strategic Diversification in Pursuit of Returns

Finally, we plan to replace the FTSE EPRA NAREIT Developed Liquid Index with the FTSE EPRA NAREIT Developed Index with the intention to gain:

- Diversification through broader exposure to the REIT universe, including smaller market cap exposures
- An opportunity for increased returns

1 Desirability

Would enacting these changes to the glidepath be expected to improve participant outcomes?

While wealth accumulation is not the only investment objective that participants must consider, it takes on added significance for younger investors. Inflationary risks, on the other hand, are outsized for participants with higher accumulated savings entering retirement. Equity returns have historically comfortably outpaced the rate of inflation, suggesting that a high allocation to equities not only provides the highest expected returns to maximize wealth accumulation, it also effectively addresses inflation risk for participants with long time horizons. With this in mind, the State Street glidepath does not establish an explicit allocation to inflation-sensitive asset classes (REITs and TIPS) until 10 to 15 years prior to retirement. Real estate investment trusts (REITs) offer inflation-hedging characteristics, but a lower long-term return expectation than traditional equities. TIPS, similarly, provide reliable inflation protection but generally offer lower yields than equivalent nominal bonds.

A third inflation-sensitive asset class, commodities, has historically been the lone exception to this rule. Commodities were added to our Target Retirement strategies in 2012, established at a 3.5% static allocation throughout the glidepath. For older participants, the rationale for holding commodities is clear — risk reduction and high sensitivity ("beta") to inflation — but there were multiple advantages to holding the asset class in our longer-dated vintages at the time that may be less apparent today.

Commodities offer diversification benefits in an equity-heavy portfolio while providing comparable (albeit slightly lower) long-term return expectations. In 2011, SSGA's long-term return forecast for commodities was 6.0%, complementing a robust 7.2% for global equities (7.0% for US and 7.3% for international — see Figure 1). Today, return expectations for US equities and commodities have compressed significantly. Further compounding matters, historically low interest rates suggest muted long-term returns for fixed-income asset classes, most notably longer-duration bonds. International equity (ACWI ex US) forecasts are more stable, largely driven by an improvement in expectations for emerging markets. In short, compressed return expectations are mostly attributable to US stocks, bonds and commodities.

Figure 1
Return Expectations Have Compressed Across Most (But Not All) Major Asset Classes

	September 2011 Forecast (%)	September 2019 Forecast (%)	Difference (bps)
US Large-Cap Equities	7.0	6.2	-80
US Bonds	3.5	2.2	-130
Commodities	6.0	5.5	-50
ACWI ex US	7.3	7.5	+20
State Street 2050 Fund	**6.8**	**6.2**	**-60**

Source: State Street Global Advisors Investment Solutions Group long-term risk and return forecasts as of September 30, 2011, and September 30, 2019. Asset class comparison does not include forecasted size premium (small-cap exposures).

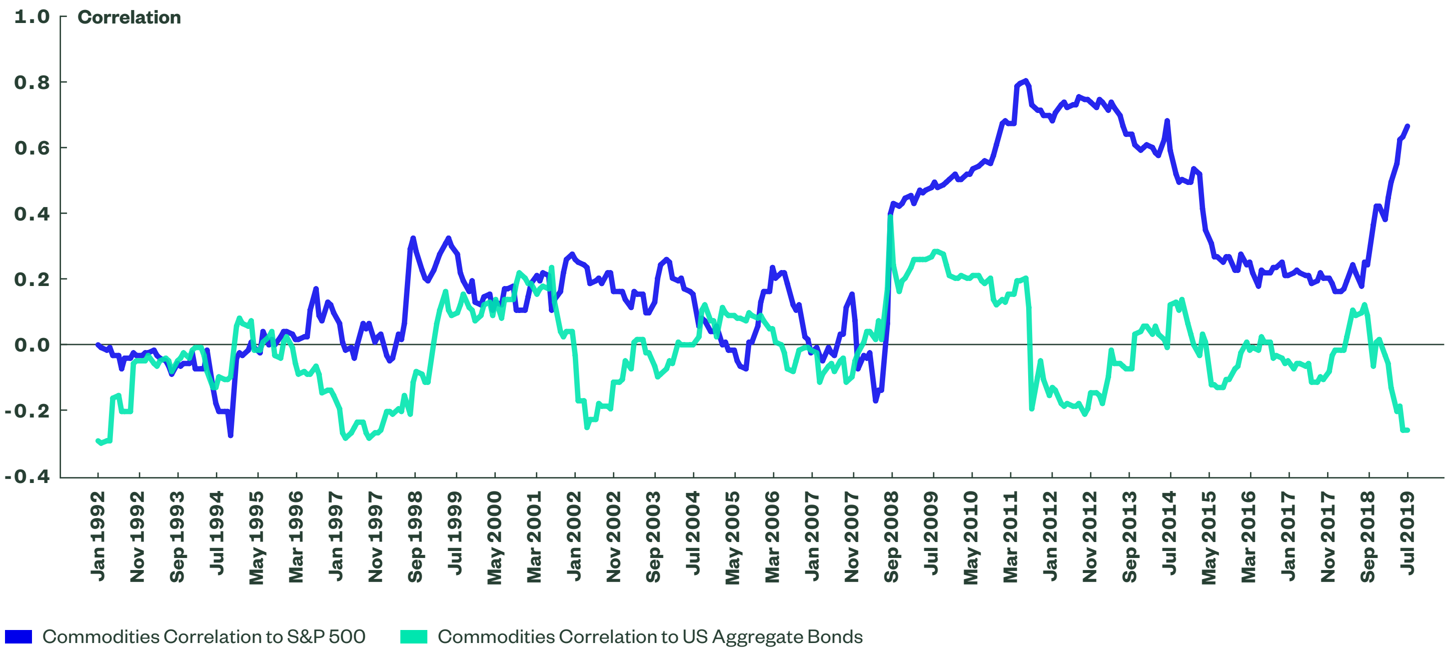
What does this all mean? The same asset allocation mix will no longer provide the same level of expected income replacement for participants entering the workforce today. We seek to improve expected returns of the earlier dated portfolios by reallocating the 3.5% allocation from commodities to equities. Equities have served as a strong long-term hedge for inflation, so the need for a dedicated inflation-hedging asset class is not as pressing for these younger participants.

Maximizing return for younger participants is a step that we believe makes sense given the headwinds facing retirement savers, but the obvious trade-off is that these improved returns may come at the expense of portfolio efficiency. To aid our case, there is growing evidence that the diversification provided by commodities relative to other growth assets may not be as meaningful as in the past. Following the global financial crisis, commodities have shown a persistently higher correlation to equities than historical averages. One logical explanation for this is that commodities have become a popular asset class in asset allocation portfolios and are generally more widely used today than 15 to 20 years ago. Our strategy is already unique in the level of downside protection provided for younger participants through our use of US long government bonds, which have historically outperformed in periods of equity market stress. The consistent historical efficacy of long bonds as a diversifier leads us to allocate away from commodities rather than from fixed income in order to improve returns.

Figure 2

Commodity Correlation to Growth Assets Has Increased Over Time

Reflects 36-Month Correlation with Stocks and Bonds



Source: State Street Global Advisors, FactSet as of September 30, 2019. Measures Bloomberg Roll Select Commodity Index rolling 36-month correlation to the S&P 500 and Bloomberg Barclays US Aggregate Bond Index.

After establishing the appropriate asset class to reduce, the next question is how to best maximize the improvement in expected return within our equity allocation. As Figure 1 details, return expectations from international stocks are higher today than for US equities. In order to maximize growth for participants with long time horizons, and consistent with our desire to provide broad global diversification, we will allocate the commodity exposure to non-US equities. This moves our allocation closer to a global market-cap weighted portfolio (market cap weights are currently 55% US/45% non-US), starting at 57.5% US and 42.5% non-US. This relatively modest increase from 40% non-US to 42.5% limits the point in time risk of a significant shift in geographic allocation, and adds eight basis points to the expected return for younger participants, an $8,000 increase in forecasted median wealth accumulation at age 65 based on current assumptions.[2]

Reflective of our focus on thoughtfully balancing key risks, re-establishing our commodities exposure at age 60 ensures that inflation remains meaningfully addressed for retirees and near retirees. Pushing back the establishment of our allocation to inflation protection improves expected returns during key wealth accumulation years, but also provides an opportunity to improve the efficacy of the allocation. Specifically, intermediate TIPS provide a long-term return expectation comparable to broad TIPS and offer lower expected risk, with the additional benefit of a higher historical correlation to CPI. Prior to these enhancements, our glidepath established exposure to broad TIPS beginning at age 50 before transitioning to intermediate TIPS into retirement (landing at 18%) in order to manage interest rate risk. By removing the allocation to broad TIPS, we move the starting point of the allocation to age 55 — improving expected returns — and provide a more efficient means of inflation protection while remaining mindful of the interest rate risk that retirees face. The overall allocation to inflation-sensitive asset classes in retirement remains unchanged.

Figure 3
Intermediate TIPS Offer More Efficient Means of Inflation Protection

	Broad TIPS	Intermediate TIPS
Long-Term Return Forecast	2.2	2.3
Long-Term Risk Forecast	6.5	5.1
Yield to Worst (%)	1.89	1.80
Option Adjusted Duration (Years)	8.3	5.19
Historical Correlation to CPI	0.13	0.26

Source: SSGA, FactSet as of September 30, 2019. Correlation to CPI data reflects quarterly returns for calendar years from 2002 to 2018. Indexes represented are Bloomberg Barclays US Government Inflation Linked Bond Index and Bloomberg Barclays US Treasury Inflation Protected Notes (1-10 Year) Index. Risk and return forecast based on long-term risk/return forecasts from State Street's Investment Solutions Group as of September 30, 2019.

2

Suitability

Are the investment decisions under consideration suitable for all DC investors?

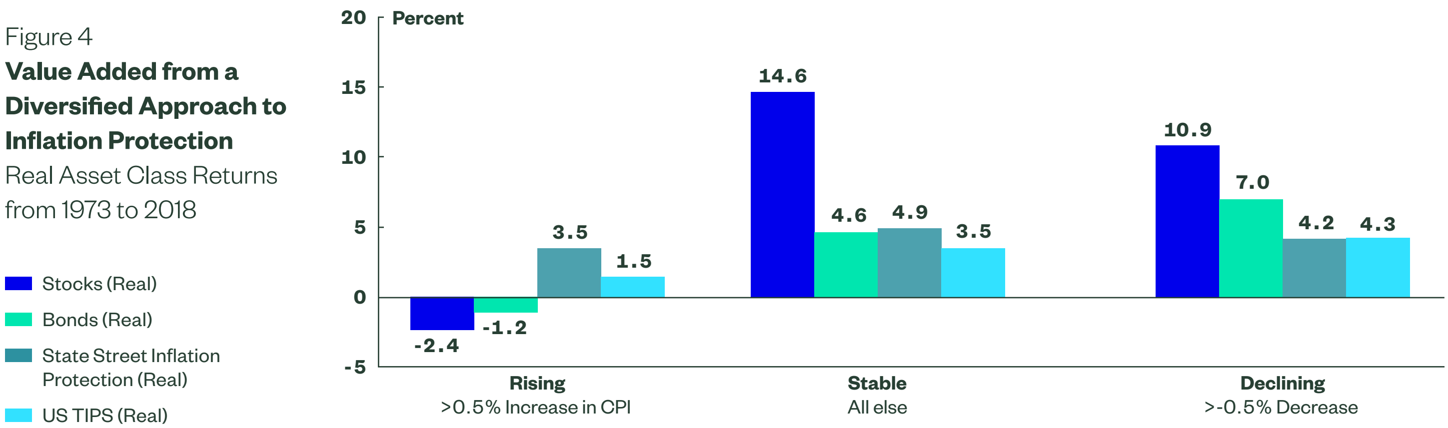
Increasing expected return is a key step toward improving outcomes, but in order to be suitable for DC participants this must be achieved in concert with careful consideration of the key risks that participants face. As participants age, wealth accumulation is surpassed in importance by concerns about market volatility and inflationary risks, in addition to the risk of running out of money in retirement. The glidepath continues to evolve as participants approach retirement in accordance with these objectives.

International equities are generally more volatile for US investors, largely because of a mix of emerging markets and foreign currency exposure. The level of currency volatility associated with an allocation to non-US equities may not be suitable for participants with shorter time horizons. As such, as we re-establish our commodities exposure at age 60 the allocation to international equities is concurrently reduced, landing at 40% of total equity at retirement — unchanged from the current glidepath.

In addition to managing for market volatility, the need to protect the purchasing power of accumulated assets is crucial. The first step in accounting for unexpected inflation risk is to provide a meaningful allocation to inflation-managing asset classes. TIPS are an obvious place to begin, but a strategy that focuses too heavily on TIPS won't accomplish our objective in the most effective manner or enable us to maximize growth. Our approach instead is to complement our IntermediateTIPS allocation with commodities and REITs, which can offer inflation management benefits at different points of the economic cycle along with higher long-term return expectations. This allows State Street to meaningfully address inflation risk within the context of the other key risks that older participants are facing — accumulation, volatility and longevity — rather than viewing the problem in isolation.

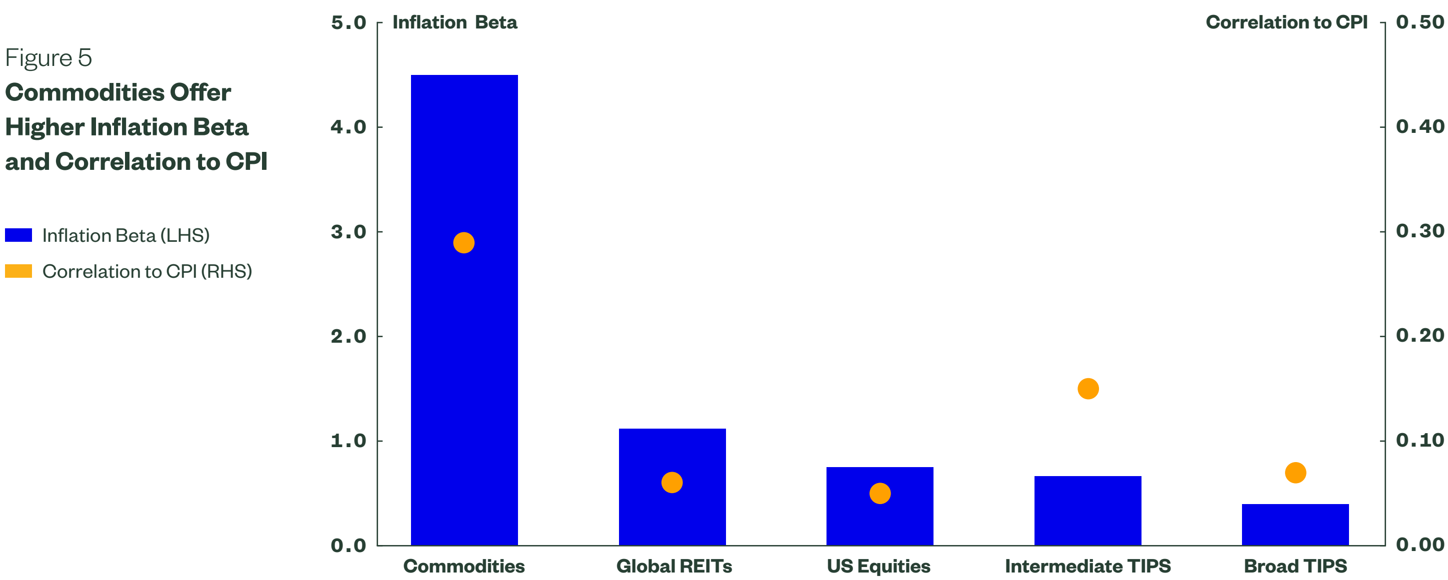
Reflecting these most recent enhancements, the glidepath will begin to establish exposure to REITs and Intermediate TIPS beginning at age 55. As participants near retirement and balances grow, allocating to commodities beginning at age 60 helps protect and preserve purchasing power while acting as a diversifier to the broader portfolio. This approach allows an investor to improve expected returns in the inflation-hedging portfolio (vs. TIPS only) and reduce the allocation to broader equities. In establishing a 3.5% allocation to commodities, we look to maintain a reasonable return expectation while placing greater value on its inflation-hedging characteristics. A relatively small allocation to commodities can still be effective in hedging against inflation because of the high beta-to-inflation (e.g., sensitivity to high or unexpected inflationary environments) that commodities have historically exhibited (see Figure 5). Because a modest allocation can have such an outsized influence on the inflation sensitivity of the portfolio, we are able to scale into the allocation over a relatively short time frame (five years). The result is a portfolio that seeks to maximize wealth accumulation for the longest possible period, without sacrificing the meaningful level of inflation protection (26.5% of the income fund — unchanged from previous levels) for retirees.

Figure 4
Value Added from a Diversified Approach to Inflation Protection
Real Asset Class Returns from 1973 to 2018



Source: State Street Global Advisors, FactSet as of September 30, 2019. Updated annually as CPI data becomes available. Asset classes are represented by the following due to availability of index data, and dates have been listed where multiple indices were used to attain the full time horizon: Stocks: S&P 500 Index; bonds: Bloomberg Barclays US Aggregate Bond Index (1976–2018) and Bloomberg Barclays US Corporate/Credit Index (1973–1975); SSGA inflation-sensitive assets: 19% FTSE EPRA NAREIT Developed Index, 13% Bloomberg Roll Select Commodity Index (1992–2018) and S&P GSCI TR (1973–1991) and 68% Bloomberg Barclays US TIPS Index; US TIPS: Bloomberg Barclays US TIPS Index; and US inflation: CPI-U. Based on annual calendar year returns with quarterly data. Past performance is not a guarantee of future results. Index returns do reflect capital gains and losses, income and the reinvestment of dividends. Performance calculated in USD. Global REIT (1973–1988) and US TIPS (1973–1998) returns prior to inception of each index are simulated by the index provider. Data is provided since 1973 because of index data availability. Pre-inception index performance shown above is back tested performance and is not a guarantee of past or future results.

Figure 5
Commodities Offer Higher Inflation Beta and Correlation to CPI



Source: State Street Global Advisors, Morningstar as of September 30, 2019. Data reflects monthly returns from January 1, 2000, through September 30, 2019. The formula for calculating beta is the covariance of the return of an asset with the return of the benchmark divided by the variance of the return of the benchmark over a certain period.

3 Investability

Can we implement these investment themes efficiently?

Just because no new asset classes were considered for inclusion does not exclude investability as a key factor in offering a thoughtful glidepath design. Consistent with our desire to optimize our inflation protection allocation, we will change the benchmark of our global REIT allocation. Given the progress of the sector and the improved liquidity profile, we are broadening exposure from the FTSE EPRA NAREIT Developed Liquid Index to the FTSE EPRA NAREIT Developed Index. A decade ago, listed real estate in general was less mature as an asset class. The FTSE EPRA NAREIT Developed Liquid benchmark was created in 2007 in response to the less liquid nature of listed real estate at the time. The market capitalization of the FTSE EPRA NAREIT Global Index has since grown from $403 billion to more than $1.7 trillion over the past 10 years. Over that same time frame, listed real estate registered funds have seen AUM growth of more than 300% and the number of registered products has more than doubled. The cumulative flows into these funds has exceeded $123 billion. The sector has continued to expand, and as result of the progression, real estate was promoted to its own sector in the Global Industry Classification Standard (GICS) in 2016. Increased visibility leads to a better understanding of the asset class, which could result in increased demand, and more demand leads to improved liquidity and reduced volatility, mitigating the need for an explicitly liquid index exposure. As such, we plan to implement this change in order to provide broader exposure to the sector and to potentially improve returns (the broad developed benchmark has outperformed by 33 bps annually over the last five years) via exposure to smaller capitalization securities.

Figure 6
Characteristics of REIT Benchmarks

	FTSE EPRA NAREIT Developed Liquid Index	FTSE EPRA NAREIT Developed Index
Number of Securities	175	336
Total Market Cap ($MM)	1,529,596	1,876,303
Weighted Average Market Capitalization ($MM)	17,927	15,493
3-Year Volatility (%)	3.6	3.7
Historical Correlation to CPI	10.2	10.1

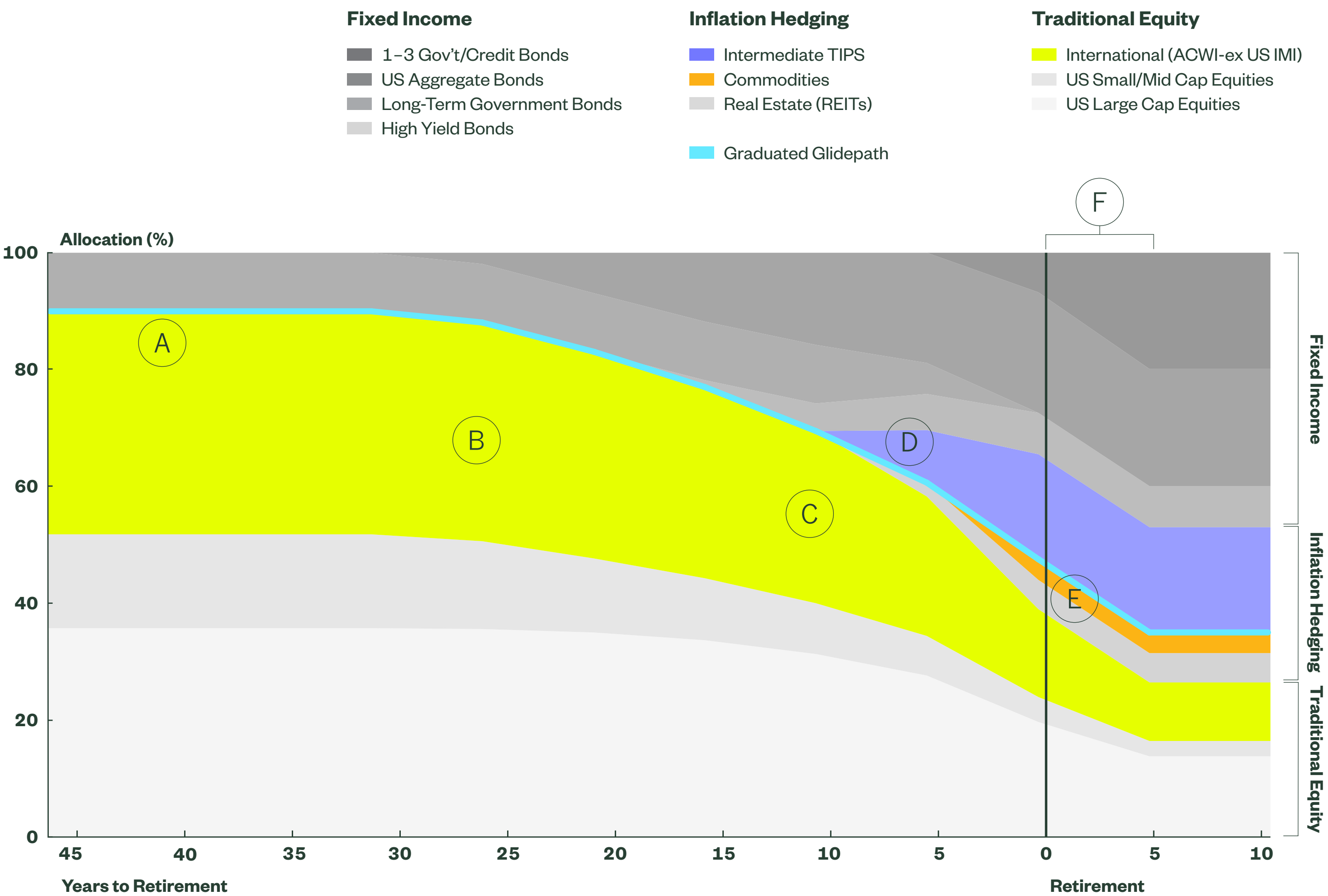
Source: FactSet, State Street Global Advisors, FTSE Russell, as of September 30, 2019.

In Closing

In keeping with the opening (2065 Fund) and closing (2015 Fund) of our target retirement vintages, our strategy is designed to evolve in the service of helping participants achieve retirement readiness. Changes do not need to be drastic to be additive, and by virtue of the broad building blocks at our disposal we are able to tweak the asset class exposures in order to deliver more appropriate risk and return expectations for participants at each stage of the life cycle.

Figure 7
Evolving a Glidepath that Balances Long-Term Returns and Key Risks
A Highlight of Enhancements

A Commodities replaced by equities early in glidepath to improve expected returns
B 42.5% of total equity exposure in International equities due to higher long-term return expectations
C International equity reduced to 40% to manage volatility (unchanged from current glidepath)
D Broad TIPS removed. Intermediate TIPS established at age 55.
E Commodities established at 60 for inflation sensitivity and diversification
F 5 Years After Retirement (Income Strategy)



Source: State Street Target Retirement Strategies strategic asset allocation roll-down schedule effective close of business June 30, 2019. The information contained above is for illustrative purposes only. Diversification does not ensure a profit or guarantee against loss. Assumptions and forecasts used by State Street Global Advisors in developing the target date funds asset allocation glidepath may not be in line with future capital market returns and participant savings activities, which could result in losses near, at or after the target date year or could result in the target date fund not providing adequate income at and through retirement. Please see disclosures for important risk disclosures.

Endnotes

1 When analyzing whether any investment is suitable for an individual, the individual's investment profile must be considered.

2 Assumes participant enters the workforce at age 21 with a $30,000 starting annual salary, 2.5% annual wage growth ($88,914 salary at age 65) and 11% contributions (including employer match) throughout the participant's career. Modeling based on long-term risk and return forecasts from State Street Investment Solutions Group as of June 30, 2019. Actual returns may vary.

About State Street Global Advisors

Our clients are the world's governments, institutions and financial advisors. To help them achieve their financial goals we live our guiding principles each and every day:

Start with Rigor We take a highly disciplined and risk-aware approach built on exhaustive research, careful analysis and market-tested experience to meet client needs. Rigor is behind every decision we make.

Build from Breadth Today's investment problems demand a breadth of capabilities. We build from a universe of active and index strategies to create cost-effective solutions.

Invest as Stewards We help our portfolio companies see that what is fair for people and sustain-able for the planet can deliver long-term performance. As fiduciaries, we believe good stewardship is good investing.

Invent the Future We created the first ETF in the US and are pioneers in index, active, and ESG investing. Using data, insights and investment skill, we are always inventing new ways to invest.

For four decades, these principles have helped us be the quiet power in a tumultuous investing world. Helping millions of people secure their financial futures. This takes each of our employees in 27 offices around the world, and a firm-wide conviction that we can always do it better. As a result, we are the world's third-largest asset manager with US $2.95 trillion* under our care.

* AUM reflects approximately $43.96 billion USD (as of September 30, 2019), with respect to which State Street Global Advisors Funds Distributors, LLC (SSGA FD) serves as marketing agent; SSGA FD and State Street Global Advisors are affiliated.

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