Retirement Reset: Next-Generation DC Solutions with Non-Traditional Components

By BNY Mellon Retirement

We continue to find great disparities in the investment opportunity sets and resulting performance between DC and DB plans.

EXECUTIVE SUMMARY

BNY Mellon Retirement has long pointed to the performance disparity between institutional-quality defined-benefit plans (DB) and defined contribution (DC) plans, especially as the latter come to dominate the retirement market. The traditional style box approach to DC plans — even within target date options — we argue, does not provide the level of diversification and risk balance DC plan participants need to achieve their retirement goals. Research conducted by BNY Mellon's Investment Strategy and Solutions Group (ISSG) shows the improved risk and return profile of DC solutions that incorporate allocations to three non-traditional areas: real assets for inflation protection, strategies combining emerging market equity and debt, and liquid alternatives. Broadening the DC universe to include the kinds of allocations that institutional-quality pension plans have used for years, we believe, provides the potential for DC plans to improve their risk-adjusted returns while managing volatility and providing greater inflation protection compared with traditional DC options.

The transition to defined contribution plans continue its rapid pace, as DC plans replace traditional defined benefit programs as the primary, if not the only, employee retirement savings vehicle in the United States. However, we continue to find great disparities in the investment opportunity sets and resulting performance between DC and DB plans. Part of this disparity may be attributed to fees and to the professional management expertise provided to DB plans. Another major reason for the performance disparity may be the challenges employees have in making prudent investment decisions, despite the educational tools provided to them by plan sponsors.

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However, we think the difference in underlying asset class exposures between DB and DC goes a long way toward explaining the performance disparities. DB plans have significantly more exposure to non-traditional, "outside-the-style-box" investment categories. We believe the limitations placed upon DC investors by the traditional "style box" investment design so prevalent in DC plans, puts DC investors at a significant disadvantage to investors in more broadly diversified DB plans. In fact, according to Callan, (creator of the Callan DC Index™) as of December 31, 2012, the average DB plan has outperformed the average DC plan by more than 180 basis points (bps) since the index's inception in 2006.[1]

Last year we highlighted the limitations of diversification within DC plans and found that, despite years of education and communication around the need for proper diversification, we still see generally poor and ineffective asset allocation strategies among active contributors.[2]

We also showed that many DC plans' current investment policy statements continue to mandate that investment options for their plans be highly concentrated in traditional style box categories. Exhibit 1 demonstrates how highly correlated traditional equity style boxes are, underscoring the insufficient diversification of many DC plan options.

Exhibit 1 – Equity Style Box Correlation Matrix of Most Common DC Equity Options January 2000 - December 2012

	(1)	(2)	(3)	(4)	(5)	(6)
(1) U.S. Large Cap Core Equity	1.00					
(2) U.S. Large Cap Value Equity	0.94	1.00				
(3) U.S. Large Cap Growth Equity	0.95	0.79	1.00			
(4) U.S. Small Cap Value Equity	0.82	0.85	0.72	1.00		
(5) U.S. Small Cap Growth Equity	0.80	0.67	0.86	0.84	1.00	
(6) Non-U.S. Developed Equity	0.88	0.85	0.82	0.78	0.76	1.00

Source: eVestment Alliance. U.S. Large Cap Core Equity is based on the S&P 500 Index data. U.S. Large Cap Value Equity is based on Russell 1000 Value Index data. U.S. Large Cap Growth Equity is based on Russell 1000 Growth Index data. U.S. Small Cap Value Equity is based on Russell 2000 Value Index data. U.S. Small Cap Value Equity is based on Russell 2000 Growth Index data. Non-U.S. Developed Equity is based on MSCI EAFE Index data.

We also looked at the incredible success of target date funds in gathering assets since becoming the primary Qualified Default Investment Alternative (QDIA) for most DC plans today. Yet, in reviewing the asset allocation of target date funds, we found that nearly all assets have been invested in traditional style box strategies, with more than 70% invested in traditional style box equities in particular (Exhibit 2). With target date funds, we found there has been no meaningful increase in diversification; rather style box investing "in disguise."

1 Retrieved from http://www.callan.com/research/dcindex/. Average DB plan returns are gross of fees.

2 Robert G. Capone, "Investment Choice within DC Plans: The Style Box Dilemma," BNY Mellon Investment Management, May 2013.

Exhibit 2 – Target Date Funds: Median Asset Allocation Levels Across 2050 Funds to Retirement Income Funds, As of 12/31/2012

Asset Class	Median Allocation
U.S. Large Cap Equity	35%
U.S. Mid Cap Equity	11%
U.S. Small Cap Equity	4%
International Equity	18%
Emerging Markets Equity	4%
Total Median Equity:	72%
Short Term Treasuries	4%
Core Fixed Income	20%
TIPS	1%
High Yield Fixed Income	2%
Total Median Fixed Income:	27%
REITS	1%

Source: S&P Indices, S&P Target Date Index Series; iSHARES Target Date ETF Series.

We then introduced the idea of broadening the investing approach in DC plans with non-correlated strategies to provide a better risk/return profile. We suggested selectively using these non-correlated strategies within a target date fund structure either in a predetermined or customized way. Exhibit 3 illustrates the low correlations between non-traditional asset classes such as emerging markets equity, real estate and commodities, compared with traditional stock and bond exposures.

Exhibit 3 – Asset Class Correlation Matrix Including Non-Traditional Asset Classes January 2000 - December 2012

	(1)	(2)	(3)	(4)	(5)	(6)
(1) U.S. Bonds	1.00					
(2) Global Bonds	0.66	1.00				
(3) U.S. Equity	-0.08	0.08	1.00			
(4) Emerging Markets Equity	-0.01	0.17	0.80	1.00		
(5) Real Estate	0.11	0.21	0.63	0.54	1.00	
(6) Commodities	-0.01	0.17	0.31	0.42	0.21	1.00

Source: eVestment Alliance. U.S. Bonds is based on the Barclays Aggregate Index data. Global Bonds is based on the Citigroup WGBI Index data. U.S. Equity is based on the S&P 500 Index data. Emerging Markets Equity is based on MSCI Emerging Markets Index data. Real Estate is based on the FTSE/NAREIT Composite Index data. Commodities is based on the S&P Goldman Sachs Commodity Index data.

NEW INVESTING PARADIGM FOR DC

To strengthen the argument for better diversification in DC plans, we worked with BNY Mellon's Investment Strategy and Solutions group to show how the next generation of DC retirement solutions could be constructed with non-traditional asset classes to seek better risk-adjusted returns, improve inflation protection and better manage downside risk. Genuine diversification and asset allocation are still key to achieving

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For us, there is a compelling opportunity for DC plans to apply institutional DB best practices when it comes to reducing equity risk and home-country bias as well as thoughtfully incorporating alternative investments to increase diversification, return potential and downside risk management.

appropriate asset accumulation and retirement income. But faced with a daunting capital markets environment with lower long-term expected returns, higher expected volatility, heightened inflation risk and expected negative real returns for fixed income, we believe the mission of investing for retirement can no longer be regarded solely as an exercise in maximizing return. Instead, we think we need nothing less than a new investing paradigm for DC plans, which entails genuine diversification, volatility management and reducing risk to provide appropriate outcomes for stable and sufficient retirement savings.

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THE DIFFERENT ASSET MIX OF DC VS. DB

As mentioned, DB plans benefit from professional investment management expertise: typically through corporate treasury staff in private plans, or through appointed or elected investment committee members for public plans. That is a very different situation compared with every-day employees trying to manage investment choices within their DC plans on their own. As a result, it is not surprising that asset allocation choices and performance results have been very different for DB and DC plans.

To demonstrate this, we looked at the average asset allocations for both a DB and a DC plan. The average DB asset allocation is derived from the 2012 Greenwich Associates universe of 2,357 U.S. institutional investors with $250 million or more in total assets. Percentages are dollar-weighted. Results are for institutional assets only; that is, corporate and union fund defined benefit plan assets.[3] The average asset allocation for a DC plan is derived from the Callan DC Index™ as of December 2012, which is an equally weighted index tracking the cash flows and performance of nearly 80 plans, representing more than 800,000 defined contribution participants and over $100 billion in assets. The index is updated quarterly and reflects 401(k) plans as well as other types of defined contribution plans.

Exhibit 4 – Average DB Allocation as of 12/31/12

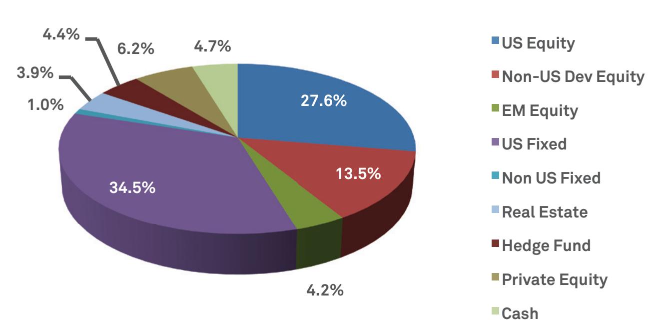
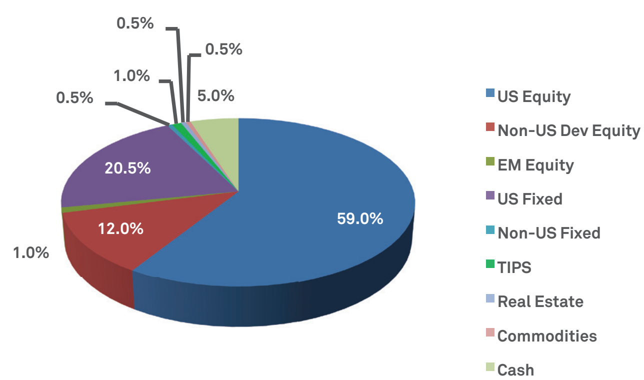


Exhibit 5 – Average DC Allocation as of 12/31/12



Source: BNY Mellon Retirement Group and BNY Mellon ISSG.

3 Please see disclosures for additional information about the assumptions.

Note how the average DC allocation has significantly more exposure to equities than DB plans. Also, the combined US equity and US fixed income allocations account for approximately 80% of the DC asset allocation compared with just over 60% for DB plans, demonstrating a significant home-country bias for DC plans. Most importantly, when it comes to truly low correlated, non-traditional diversifying categories, the average DB plan has nearly a 20% allocation to a combination of Alternatives, Real Assets and Emerging Markets; whereas the average DC plan has minimal exposure to these asset classes.

In sum, DB plans have broadened their exposure to assets like non-U.S. equities, including emerging market equities, because they understand that the global economy is changing and that some of the most attractive investment opportunities are found outside the U.S. as the emerging world continues to grow and evolve. Moreover, they know that expanding the universe of their asset class exposures increases return potential as well as diversification, which in turn can lower overall risk. Similarly, they are aware of the need to protect against inflation with allocations to real assets as well as the enhanced diversification and downside risk management benefits that alternatives can provide.

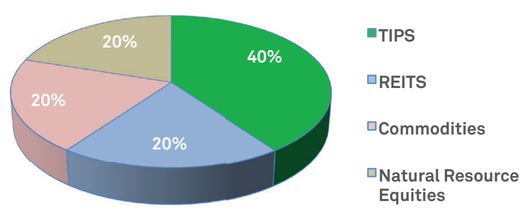
We believe that DC participants' liabilities are in real terms, as participants need to protect their purchasing power in retirement.

CONSIDERING THE "ALTERNATIVES" FOR DC

To demonstrate the effect of making DC asset allocation look more like DB asset allocation, we measured what would happen if our average DC plan allocated 20% of its assets to non-traditional strategies, which we categorize in this analysis as Real Assets, Total Emerging Markets (combining EM equity and debt exposure), and Liquid Alternatives.

We believe that DC participants' liabilities are in real terms, as participants need to protect their purchasing power in retirement. Thus, we propose that exposure to Real Assets provides a hedge against inflation, as their value tends to rise as inflation rises. We define our real asset allocation as a balanced exposure to TIPS, REITS, Commodities and Natural Resource Equities (Exhibit 6).

Exhibit 6 – Composition of 20% Real Asset Allocation



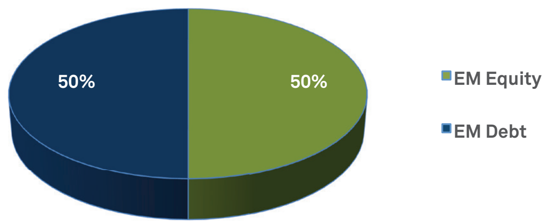
Source: Bloomberg, Datastream, HFRI, Cambridge Associates and ISSG. TIPS is based on Barclays Capital U.S. TIPS Index. REITs is based on FTSE NAREIT Equity Total Return Index. Commodities is based on DJ UBS Commodities Total Return Index. Natural Resource Equities is based on S&P Global Natural Resources Index.

We also chose a dedicated allocation to Total Emerging Markets for a number of reasons. First, it provides access to high-growth regions of the world and has historically had higher expected returns than developed market counterparts, while also reducing home-country bias and increasing portfolio diversification.

Furthermore, by combining emerging markets equity and fixed income for our total emerging markets exposure, we provide a more blended and balanced approach that seeks to reduce volatility and diversify country and currency risks than would be the case for emerging markets equity exposures alone (Exhibit 7).

With Liquid Alternatives, we believe there is an attractive opportunity to provide DC participants with a more diversified source of non-correlated returns

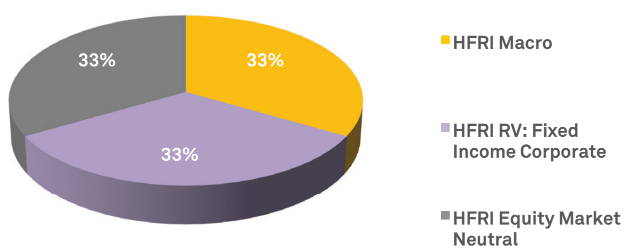
Exhibit 7 – Composition of 20% Total Emerging Markets Allocation



Source: Bloomberg, Datastream, HFRI, Cambridge Associates and ISSG. EM Equity is based on MSCI Emerging Markets TR Index. EM Debt is based on JPM EMBI Global Total Return USD Index.

With Liquid Alternatives, we believe there is an attractive opportunity to provide DC participants with a more diversified source of non-correlated returns. We also believe these strategies are noticeably less correlated to equity market strategies. There are countless definitions of liquid alternatives and various ways to obtain exposures. For this analysis, we chose a simple balanced exposure to three of the most prevalent types of liquid alternative strategies (Exhibit 8). We also chose the HFRI indices to provide a simple beta-only exposure for our modeling.

Exhibit 8 – Composition of 20% Liquid Alternatives Allocation



Source: HFRI Indices data.

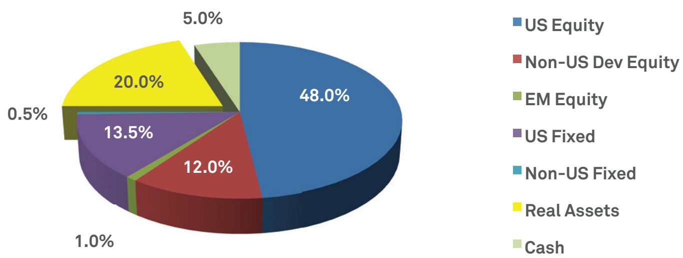
NEW DC ALLOCATION SCENARIOS

Utilizing these three main areas for non-traditional investment strategy allocation, we devised four different allocation scenarios such that each scenario could be implemented as either a stand-alone component within a DC plan or as a "sleeve" component within a target date fund in a DC plan. With either implementation, we viewed the allocation as a percentage of the total plan line-up.

Utilizing these three main areas for non-traditional investment strategy allocation, we devised four different allocation scenarios such that each scenario could be implemented as either a stand-alone component within a DC plan or as a "sleeve" component within a target date fund in a DC plan.

Scenario 1 – Exhibit 9
DC Allocation Adjusted to include 20% Real Assets Allocation

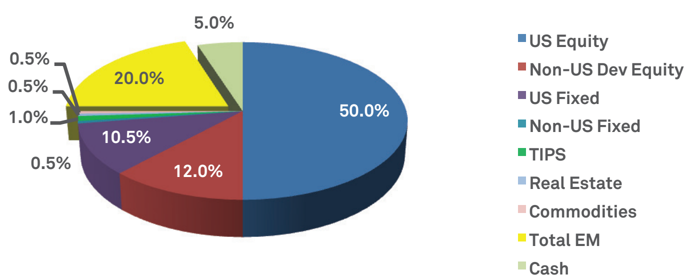
Average DC allocation adjusted to include a 20% allocation to Real Assets to improve sensitivity to changes in inflation.



Source: BNY Mellon Retirement Group and BNY Mellon ISSG.

Scenario 2 – Exhibit 10
DC Allocation Adjusted to include 20% Total Emerging Markets Allocation

Average DC allocation adjusted to include a 20% allocation to Total EM to provide diversified exposure to global growth.

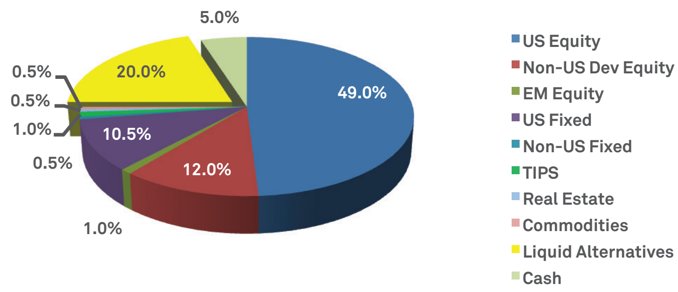


Source: BNY Mellon Retirement Group and BNY Mellon ISSG.

From an allocation standpoint, we have successfully reduced equity exposure and home-country bias.

Scenario 3 – Exhibit 11
DC Allocation Adjusted to include 20% Liquid Alternatives Allocation

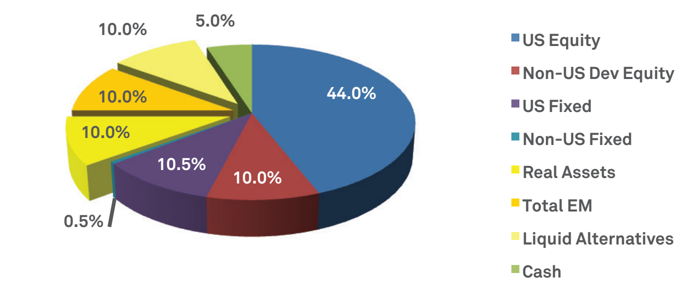
Average DC allocation adjusted to include a 20% allocation to Liquid Alternatives to provide a more diversified source of non-correlated returns.



Source: BNY Mellon Retirement Group and BNY Mellon ISSG.

Scenario 4 – Exhibit 12
DC Allocation Adjusted to include 10% Allocation each to: Real Assets, Total EM, Liquid Alternatives

DC with 10% allocation each to Real Assets, Total EM and Liquid Alternatives "Combo".



Source: BNY Mellon Retirement Group and BNY Mellon ISSG.

In the Total EM and Liquid Alternatives scenarios, note how equity exposure declined from the average DC allocation of 73% to a maximum of 62% of the total portfolio allocation. Also, US equity exposure declined from the average DC plan exposure of 59% to a maximum of 50% in these scenarios.

From an allocation standpoint, we have successfully reduced equity exposure and home-country bias. But how do these allocations measure up against the expected returns of the average DC allocation?

Exhibit 13 – Overall Results: Simulated Performance for the past 20 Years, ending 12/31/2012

	Avg DC Plan	Avg DC w/ Real Assets	Avg DC w/ Total EM	Avg DC w/ Liquid Alts	Avg DC w/ Combo
Average Annual Return	7.7%	7.9%	8.4%	7.8%	8.2%
Risk*	11.0%	10.6%	12.2%	10.0	10.4%

*Risk is defined as Standard Deviation of Returns.

Source: BNY Mellon ISSG.

To better understand the disparities in risk and return, we also need to appreciate the influence of macroeconomic conditions on asset prices.

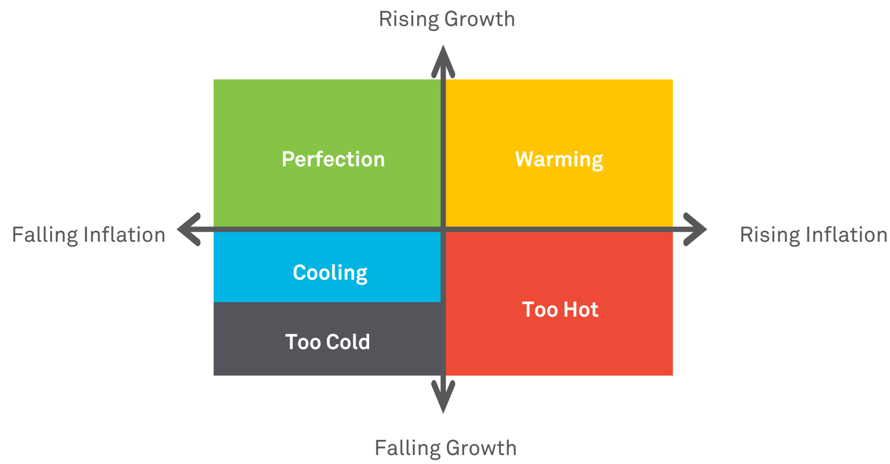
In our hypothetical back-tested scenarios, the addition of these non-traditional exposures increased the annualized returns over the average DC plan in all cases. The average risk decreased the most in the liquid alternatives portfolio. In fact, risk also decreased by including real assets and the combined allocation to all three investments. Only the emerging markets exposure increased risk over the average DC plan, but in that case, exposure to high growth emerging markets also increased the average return more than any other portfolio scenario as well.

To better understand the disparities in risk and return, we also need to appreciate the influence of macroeconomic conditions on asset prices. The ISSG has looked at how changes in growth and inflation expectations affect asset prices over time and has used this historic performance to map out five different macroeconomic regimes or “climates” reflecting growth and inflation trends.

MACROECONOMIC INFLUENCES ON RESULTS

The results shown in Exhibit 13 reflect the overall annualized return/risk effects from incorporating non-traditional assets for an entire prior 20-year period. Asset classes behave differently over varying economic regimes and are often characterized based on their sensitivity to growth and inflation factors. In our view, regimes reflect the possible combinations of economic growth and inflation scenarios (Exhibit 14). Historically investors have characterized three basic economic regimes as: Too Hot (Rising Inflation & Falling Growth), Too Cold (Sharply Falling Growth & Inflation), and just right or Perfection (Rising Growth & Falling Inflation). We define two other regimes as Warming (Rising Growth & Inflation at controlled levels) and Cooling (Falling Growth & Inflation at controlled levels). The Warming and Cooling regimes actually occur with the greatest frequency (Exhibits 15 & 16), and historical data has shown that growth assets can still perform well when GDP is falling (Cooling) as long as the decrease is in moderation and inflation is still being accommodative.

Exhibit 14 – Macroeconomic Regimes



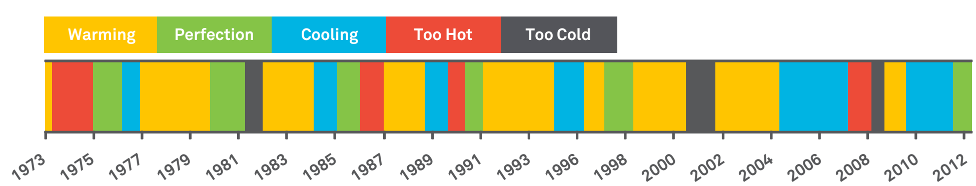
Source: BNY Mellon ISSG.

Exhibit 15 – Macroeconomic Regime Frequency from 1973 to 2012

Regime	Inflation	Growth	Frequency
Warming	Steady/Rising	Steady/Rising	43%
Perfection	Falling	Rising	17%
Cooling	Falling	Falling	23%
Too Hot	Rising	Falling	11%
Too Cold	Falling	Sharply Falling	6%

April 1973 to March 2013.
Source: BNY Mellon ISSG.

Exhibit 16 – Actual Macroeconomic Regimes 1973 - 2012



The exhibits above denote a view of economic enviroments that center on growth and inflation expectations.
Source: BNY Mellon ISSG.

PERFORMANCE IN DIFFERENT MACROECONOMIC REGIMES

Exhibit 17 shows what happens when we implement our non-traditional strategies into DC plans across the varying macroeconomic regime "climates."

Exhibit 17 – Simulated Performance in Varying Regimes, for the past 20 Years ending 12/31/2012

Regimes	Avg DC Plan	Avg DC w/ Real Assets	Avg DC w/ Total EM	Avg DC w/ Liquid Alts	Avg DC w/ Combo
Warming	11.2%	11.6%	13.1%	11.3%	12.1%
Perfection	15.8%	13.6%	12.7%	14.6%	12.7%
Cooling	13.7%	13.8%	14.9%	13.0%	13.7%
Too Hot	-6.8%	-4.4%	-6.5%	-5.7%	-4.5%
Too Cold	-23.6%	-23.0%	-25.0%	-21.4%	-21.6%
All Regimes	7.7%	7.9%	8.4%	7.8%	8.2%

Source: BNY Mellon ISSG.

In periods of high inflation – "Too Hot" – the real assets component in the "Avg DC with Real Assets" helped to hedge inflation tail risk (Exhibit 17). In other more likely regimes such as "Warming" or "Cooling", the emerging markets allocation in the "Avg DC with Total EM Allocation" helped diversify growth and had better simulated performance. We also see that an allocation to Real Assets also improved simulated performance. In the recessionary tail regime – Too Cold – the Liquid Alternatives allocation reduced the negative return and also reduced systematic risk. The "Combo" allocation did best in the inflation and growth tail risk scenarios.

In aggregate, by broadening exposures, we have the potential to increase performance over the average DC allocation in all macroeconomic regimes, with the exception of the Perfection regime where the equity-heavy average DC allocation has the greatest exposure to growth assets. However, as mentioned earlier, investing for retirement is not just about increasing return but also managing risk. In Exhibit 18, we see that the standard deviation of returns is lower in each hypothetical scenario compared with that of the average DC allocation scenario except for the DC option with Total EM exposure.

In that particular case, the increased risk was commensurate with the simulated return – specifically in the growth regimes. In all other cases, we saw an increased return and a reduction in the risk profile of the DC portfolio.

Exhibit 18 – Risk* Based on Simulated Performance in Varying Regimes, for the past 20 Years ending 12/31/2012

Regimes	Avg DC Plan	Avg DC w/ Real Assets	Avg DC w/ Total EM	Avg DC w/ Liquid Alts	Avg DC w/ Combo
Warming	10.5%	9.8%	11.8%	9.4%	9.9%
Perfection	9.9%	9.1%	11.2%	9.0%	9.3%
Cooling	8.5%	8.6%	9.3%	7.9%	8.2%
Too Hot	10.4%	10.0%	11.8%	9.5%	10.0%
Too Cold	17.1%	17.1%	18.9%	15.1%	16.3%
All Regimes	11.0%	10.6%	12.2%	10.0%	10.4%

*Risk is defined as Standard Deviation of returns.

Source: BNY Mellon ISSG.

NEXT-GENERATION DC RETIREMENT SOLUTIONS

Moving DC investment line-ups away from traditional style box investment structures and incorporating asset classes found in institutional-quality DB plans accomplished two main objectives: we explored ways to increase returns and reduce risks across the most common growth and inflation conditions. We also showed that a change in the DC investing paradigm can allow for more investment stability and the potential for better risk-adjusted returns. For us the math is clear: incorporating these non-traditional strategies reduced risk, provided a hedge against inflation, and managed volatility while improving diversification and performance through non-correlated assets.

Given the enormity of the retirement savings challenge in the U.S., we think the next generation of DC retirement solutions must include strategies that are more relevant for the realities of a shifting global economy and the capital markets we invest in. However, we need to underscore the challenge in the DC retirement industry to offer these non-traditional strategies on a broader and more consistent basis. Although asset classes such as Real Assets, Total Emerging Markets and Liquid Alternatives are commonly deployed by the largest and most sophisticated DB plans, they are all very new asset categories for the Defined Contribution world. We believe it will take a concerted effort by major stakeholders in our industry – plan sponsors, consultants, record-keepers, advisors and policymakers – to literally "buy into" these new strategies and advance the cause of enhanced diversification and risk management for the DC plan participant. For our part, we will continue to raise the awareness and visibility of these strategies so that DC plan sponsors and their participants can ultimately benefit from the insights, analysis and best practices from the institutional pension plan world.

Given the enormity of the retirement savings challenge in the U.S., we think the next generation of DC retirement solutions must include strategies that are more relevant for the realities of a shifting global economy and the capital markets we invest in.

ASSUMPTIONS

Average DB Allocation:

Allocations to asset classes for corporate defined benefit assets are sourced from the 2012 Greenwich Associates universe of 2,357 U.S. institutional investors with $250 million or more in total assets. Percentages are dollar-weighted. Results are for institutional assets only: corporate and union fund defined benefit plan assets. "Other investment" category in the report is proxies as "Cash" category. 35.5% allocation in "Fixed Income" category is split into 34.5% allocation to "US Fixed Income and 1% to "Non US Fixed Income" categories.

Average DC Allocation:

Allocations to asset classes for defined contribution assets are sourced from the The Callan DC Index™. The Callan index is an equally weighted index tracking the cash flows and performance of nearly 80 plans, representing more than 800,000 defined contribution participants and over $100 billion in assets. The Index is updated quarterly and reflects 401(k) plans as well as other types of defined contribution plans. For purposes for comparison with the average DB allocation, portions of the Callan DC Index were distributed as follows:

- Domestic/Global Balanced category was proxies as 60% US Equities and 40% US Fixed Income allocation.

- Target Date allocation was proxies based on Callan Target Date Index Asset Allocation at 20 year horizon.

- Allocation in Company Stocks, Brokerage Window, Stable Value and Other categories were proportionally distributed to asset classes used in DC Index asset allocation.

HYPOTHETICAL OR SIMULATED PERFORMANCE RESULTS HAVE CERTAIN INHERENT LIMITATIONS. UNLIKE AN ACTUAL PERFORMANCE RECORD, SIMULATED RESULTS DO NOT REPRESENT ACTUAL TRADING. SIMULATED TRADING PROGRAMS IN GENERAL ARE ALSO SUBJECT TO THE FACT THAT THEY ARE DESIGNED WITH THE BENEFIT OF HINDSIGHT. ALSO, SINCE THE TRADES HAVE NOT ACTUALLY BEEN EXECUTED, THE RESULTS MAY HAVE UNDER OR OVER COMPENSATED FOR THE IMPACT OF CERTAIN MARKET FACTORS. IN ADDITION, HYPOTHETICAL TRADING DOES NOT INVOLVE FINANCIAL RISK. NO HYPOTHETICAL TRADING RECORD CAN COMPLETELY ACCOUNT FOR THE IMPACT OF FINANCIAL RISK IN ACTUAL TRADING. FOR EXAMPLE, THE ABILITY TO WITHSTAND LOSSES OR TO ADHERE TO A PARTICULAR TRADING PROGRAM IN SPITE OF THE TRADING LOSSES ARE MATERIAL FACTORS WHICH CAN ADVERSELY AFFECT THE ACTUAL TRADING RESULTS. THERE ARE NUMEROUS OTHER FACTORS RELATED TO THE ECONOMY OR MARKETS IN GENERAL OR TO THE IMPLEMENTATION OF ANY SPECIFIC TRADING PROGRAM WHICH CANNOT BE FULLY ACCOUNTED FOR IN THE PREPARATION OF HYPOTHETICAL PERFORMANCE RESULTS, ALL OF WHICH CAN ADVERSELY AFFECT TRADING RESULTS.

INDEX DESCRIPTIONS

S&P 500 Total Return Index: The S&P 500 is an index designed to track the performance of the largest 500 US companies

Russell 1000 Growth Index: The Russell 1000 Growth Index measures the performance of the large-cap growth segment of the U.S. equity universe. It includes those Russell 1000 Index companies with higher price-to-book ratios and higher forecasted growth values.

Russell 1000 Value Index: The Russell 1000 Value Index measures the performance of the large-cap value segment of the U.S. equity universe. It includes those Russell 1000 Index companies with lower price-to-book ratios and lower expected growth values.

Russell 2000 Growth Index: The Russell 2000 Growth Index measures the performance of the small-cap growth segment of the U.S. equity universe. It includes those Russell 2000 Index companies with higher price-to-value ratios and higher forecasted growth values.

Russell 2000 Value Index: The Russell 2000 Value Index measures the performance of small-cap value segment of the U.S. equity universe. It includes those Russell 2000 Index companies with lower price-to-book ratios and lower forecasted growth values.

MSCI EAFE Daily TR Gross USD Index: The MSCI EAFE Index (Europe, Australasia, Far East) is designed to measure the equity market performance of global developed markets, excluding the US & Canada

MSCI Emerging Markets Index: The MSCI Emerging Markets Index is designed to measure equity market performance of emerging markets consisting of the following 21 emerging market country indices: Brazil, Chile, China, Colombia, Czech Republic, Egypt, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Morocco, Peru, Philippines, Poland, Russia, South Africa, Taiwan, Thailand, and Turkey.

Barclays Capital Global Aggregate Index: The Barclays Capital Global Aggregate Index is designed to track the performance of the broad universe of global Investment Grade securities.

Barclays Capital US TIPS Index: The Barclays Capital US TIPS index is designed to track the performance of US Treasury Inflation Protected Securities. Returns are simulated by ISSG prior to 1997.

Cambridge Associates Private Equity Index: The Cambridge Associates LLC U.S. Private Equity Index® is derived from performance data compiled for funds that represent the majority of the institutional capital raised by private equity partnerships between 1986 and 2012. The quarterly series is converted to monthly.

Citigroup 3 Month Treasury Bill: The Citigroup Three Month Treasury Bill index tracks the performance of 90 day U.S. Treasury bills.

Citigroup WGBI Index: The Citigroup WGBI (World Government Bond Index) is a market capitalization weighted bond index consisting of the government bond markets of the multiple countries. The index includes all fixed-rate bonds with a remaining maturity of one year or longer and with amounts outstanding of at least the equivalent of US$25 million.

JPM EMBI Global Total Return USD Index: The JPM EMBI Global Index tracks total returns for traded external debt instruments in the emerging markets. Results simulated before 1993.

FTSE NAREIT Equity Total Return Index: The FTSE/NAREIT index is designed to track the performance US Real Estate Investment Trusts.

DJ-UBS Commodities Total Return Index: Index is designed to provide diversified commodity exposure with weightings based on the commodity's liquidity and economic significance.

S&P Goldman Sachs Commodity Index: Index contains as many commodities as possible, with rules excluding certain commodities to maintain liquidity and investability in the underlying futures markets. The index currently comprises 24 commodities from all commodity sectors - energy products, industrial metals, agricultural products, livestock products and precious metals.

S&P Global Natural Resources Index: The S&P Global Natural Resources Index tracks 90 of the largest global natural resource equities. Based on Datastream Energy & Materials returns prior to 11/02.

HFRI Fund Weighted Composite Index: The HFRI Fund Weighted Composite Index is a global composite index in USD with over 2000 single manager constituent funds. https://www.hedgefundresearch.com/

HFRI Macro (Total): Index includes strategies of Investment Managers which execute a broad range of strategies in which the investment process is predicated on movements in underlying economic variables and the impact these have on equity, fixed income, currency and commodity markets. https://www.hedgefundresearch.com/

HFRI RV: Fixed Income-Corporate: Index includes strategies in which the investment thesis is predicated on realization of a spread between related instruments in which one or multiple components of the spread is a corporate fixed income instrument. https://www.hedgefundresearch.com/

HFRI Equity Market Neutral: Index includes strategies employ sophisticated quantitative techniques of analyzing price data to ascertain information about future price movement and relationships between securities, select securities for purchase and sale. https://www.hedgefundresearch.com/

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