THE CASE FOR DISAGGREGATING CORE FIXED INCOME

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Introduction

Developments in fixed income markets over the past several years have intensified the need to re-examine core fixed income portfolios. A confluence of significant events — the subprime crisis in the summer of 2007, the failure of several important US financial institutions in 2008, and the subsequent Federal Government response — set the stage for a challenging market environment. As a result, some fixed income sectors experienced unprecedented and uncharacteristic volatility in 2008 and 2009, as investors faced poor active manager performance, the failure of diversification among bond markets, and severe illiquidity.

Although we could spend pages analyzing these events and their impact on fixed income, in this paper we look ahead to a new investment framework. In doing so, we question traditional investment techniques and embrace an objectives-based approach to bond investing that moves away from a focus on benchmarks in favor of disaggregating the components of core bonds.

Fixed income instruments are essential to institutional portfolios. Through an objectives-based approach, they can play a role in each step of the asset allocation and investment process. We believe that a focus on the roles that different fixed income instruments can provide in a portfolio will enable investors to build more effective investment programs.

Key topics in this paper:

- The history of bond investing, and the approach that many investors currently use
- Shortcomings of traditional core and core-plus fixed income strategies
- The disaggregation of fixed income return and risk into key components: identifying duration, convexity and credit as the primary betas
- An asset allocation approach to fixed income investing that seeks to address portfolio objectives, meet alpha expectations, and provide diversification in different market environments

Too often, bonds have become an overlooked part of investment portfolios. We believe that opportunities exist for bonds to work harder in all types of investment programs including defined benefit, endowment/foundation, and defined contribution portfolios. These opportunities include construction of more specific, objective-driven beta exposures as well as unconstrained alpha-seeking strategies. We recognize that this may cause investors' portfolios to look unconventional and unfamiliar. However, the need for a new approach to fixed income has existed for several years, and the recent crisis has both intensified this need and created an opportunity for change.

A BRIEF HISTORY OF BOND INVESTING

Bonds have been a core component of institutional investment portfolios for a long time. During and after World War II, pension plans became popular as a way to increase employee benefits and compensation, and early pension funds invested mostly in fixed income securities or annuity contracts. The growth in the pension system coincided with the growth of insurance company portfolios and endowment funds, with government and corporate bonds serving as a core portfolio component.

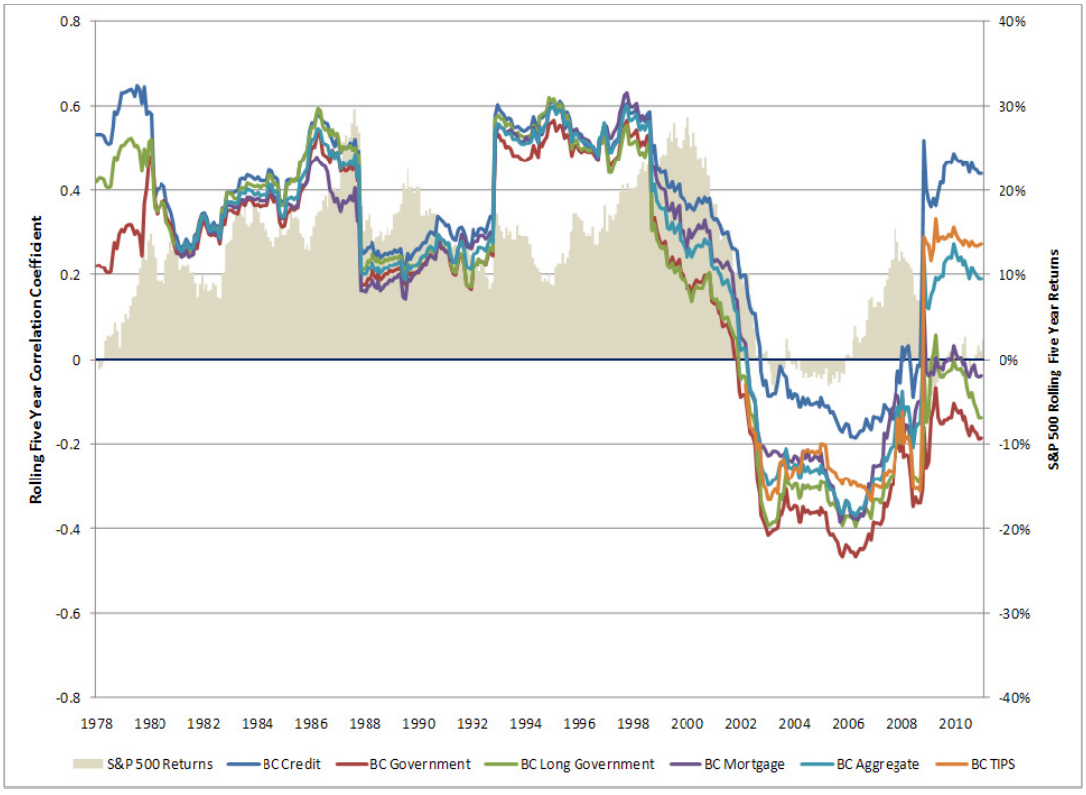
The evolution of institutional investing through the 1960s and 1970s was driven in part by the development and testing of the concepts of Modern Portfolio Theory (MPT). In defining portfolio investing, this approach established an efficient frontier and portfolio optimization based on asset class risk, return, and correlation inputs (with risk defined as volatility or standard deviation of returns). The application of MPT to institutional investment programs became more widespread in the late 1970s and 1980s, resulting in balanced portfolios of stocks, bonds, and cash. In this context, bonds were used to provide income and to dampen the volatility associated with equity markets. Thus, the classic 60/40 stock/bond allocation for institutional portfolios became the benchmark for many investors.

The strategy of investing in bonds to balance equity risk persisted through the 1980s and 1990s, and worked relatively well for most investment portfolios. Equity markets experienced a secular bull market while inflation and interest rates gradually subsided, providing stability and a tail-wind to the bond market. Capital flooded financial markets and risk premia decreased, while investment programs became increasingly return-seeking. Investment markets broadened and efficient frontiers expanded with the addition of diversifying asset classes. However, even with the expansion of equity markets into small cap, international, and emerging markets, and the addition of alternative investment strategies, the overwhelming risk factor in investment portfolios continued to be broad equity exposure.

Exhibit 1 displays the rolling return correlations of investment grade bond sectors versus the S&P 500. For most of the 1980s and 1990s, equities and bonds experienced strong returns, which explains the positive correlation between the asset classes. In the early 2000s, however, equities experienced a protracted period of poor performance and bonds helped diversify these risks, although the relationship between investment grade bond sectors and equities became increasingly frayed. The chart clearly shows that, in the past few years, not all sectors of investment grade bonds diversified equity risks. The various "bond betas" — the return drivers for fixed income market segments — diverged dramatically. During the most recent credit crisis, the kind of investment grade bond exposure an investor had grew in significance. Investment grade credit, in particular, became more correlated with equities during a period of negative equity returns, while nominal government bonds performed exceedingly well.

The composition of fixed income markets has also changed over the years. In the 1970s and 1980s, expansion of public fixed income markets beyond Treasuries and corporate bonds began with mortgage-backed securities. The 1980s witnessed the birth of the high yield bond market and the

Exhibit 1 – Rolling bond and equity return correlations



Source: eVestment Alliance

growth of global fixed income. Emerging markets debt — and later asset-backed securities, commercial mortgage-backed securities, and inflation-linked bond markets — became more main-stream in the 1990s and 2000s.

In the past decade, the use of derivative instruments in bond portfolios increased, with Treasury futures, interest rate futures or swaps, mortgage derivatives, and credit default swaps growing more common as alternatives to owning physical securities. The growth of leveraged finance, off-balance sheet finance, and securitization fueled a growth in bank loans and an explosion of products such as Collateralized Debt Obligations (CDOs) and Collateralized Loan Obligations (CLOs) in structured credit markets. As a result, bond markets have become deeper and more complex as technological and financial innovations have supported more sophisticated and more complex fixed income instruments.

Today, all of these securities are part of the global investment portfolio. While they present substantial opportunities, they also pose challenges: how to best invest in them, which benchmarks should be used, and what objectives they should address in institutional portfolios.

SHORTCOMINGS OF TRADITIONAL FIXED INCOME STRATEGIES

The Barclays Capital (formerly Lehman) Aggregate Bond Index (BC Aggregate) is a widely used index that approximates the capitalization and performance of the US public investment grade bond market. However, it has inherent limitations that present problems for today's fixed income investors.

NEARLY 80% OF THE SECURITIES IN THE BC AGGREGATE INDEX ARE GOVERNMENT ISSUED OR SUPPORTED

About the BC Aggregate

The Index was launched in 1986, with performance history back-dated to 1976, and now includes Treasury bonds (excluding TIPS), government-related debentures, agency mortgage-backed securities, investment grade corporate bonds, and to a lesser extent asset-backed and commercial mortgage-backed securities. The index is capitalization weighted, with inclusion rules governing minimum issue size, maturity, fixed rate coupons, and liquidity. Only SEC registered or Rule 144A securities with registration rights are included.

The industry has long used the index to benchmark core bond or core-plus bond mandates, which represent the most common means by which investors have gained exposure to the broad bond market. Following from the balanced-portfolio mentality of the 1980s and 1990s, selecting managers to actively invest against the BC Aggregate was an easy and relatively low-cost way to gain exposure to investment grade bonds. The index, however, has become increasingly difficult for managers to consistently outperform and, because of the recent extreme volatility in some fixed income markets, active manager performance may not have met expectations.[1]

Before suggesting a new framework for fixed income investing, we should first address some of the specific reasons that the BC Aggregate fails to address some important portfolio objectives:

Index Constraints – The index is designed to capture the general performance of the public investment grade bond market, and follows the tradition of using indexes to define investment opportunities. Index constraints such as credit quality, issuer size, fixed rate coupons, and maturity create segments in a market that should otherwise be viewed as more fluid. Market indexes also do not capture derivatives, which have become a growing component of fixed income portfolios.

The Index is Not Investable – Unlike the S&P 500 or other well known equity indices, the BC Aggregate is non-replicable and difficult to gain exposure to synthetically. Indexing is an option, but bond index funds cannot completely replicate the market because bonds trade over the counter, and not on an exchange. Index funds must create "sample" portfolios of certain segments of the bond market to attempt to capture overall performance.

Mismatch with Objectives – Perhaps most important, the index does not address some important portfolio objectives. By targeting duration, bonds may be used to hedge or defease fixed liabilities. However, BC Aggregate exposure, with a duration of around 4.5 years, is unlikely to approximate a portfolio's associated liability stream. In addition to addressing asset/liability mismatches, securities such as inflation-linked bonds may also be used in cases where inflation is a concern. Core and core-plus bond portfolios also may not be a reliable deflation hedge, since active managers tend to underweight high-quality government bonds in favor of spread (non-

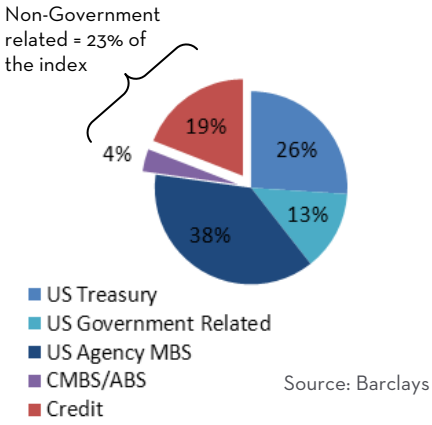
[1] For a detailed discussion and analysis of active manager performance, please see NEPC's paper: "Revisiting the Active Vs. Passive Decision – Moving Beyond The Data-Driven Framework" April 5, 2010, available at *www.nepc.com*

treasury) sectors.

Index Composition – Because the index is capitalization weighted, the largest issuers in the index tend to be those with the greatest debt burdens. This contrasts with equity market indices, in which market capitalization is the result of positive growth and increased market share. In the most recent time period, the federal government intervened in many fixed income markets, with government-issued and government-backed securities (including the implicitly guaranteed Government Sponsored Entities (GSEs) Fannie Mae and Freddie Mac) comprising nearly 80% of the overall index composition (Exhibit 2).

Problems with Active Management – Core-plus mandates have not effectively addressed some of the reasons that the BC Aggregate is an unattractive opportunity for many investors. By loosening some constraints on credit quality, currency, and risk exposures, and by allowing more out-of-benchmark investing, managers have a greater tool set to work with to beat the index. However, core-plus strategies still use tracking error constraints to the index. Recent performance among fixed income managers also raises questions of whether managers have delivered alpha, or have instead taken large beta positions.

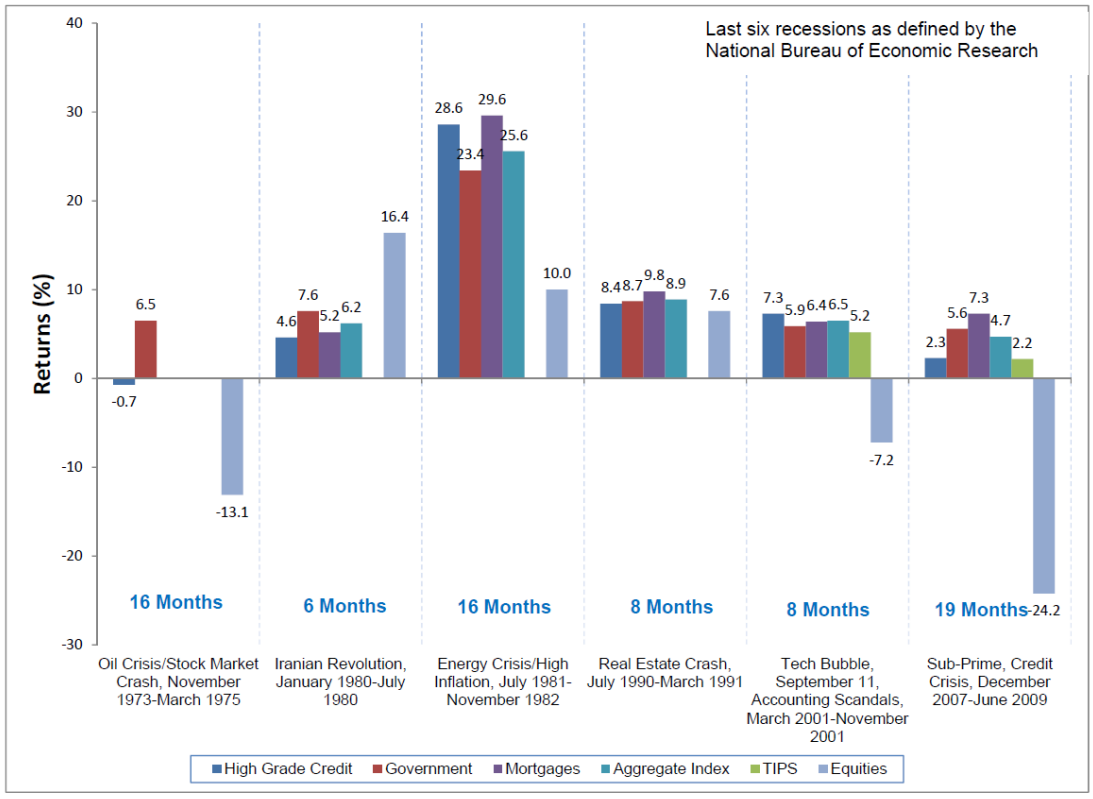
Exhibit 2 – BC Aggregate Sectors



Source: Barclays

It is not the components of the BC Aggregate that make it an unsuitable benchmark, but rather it is the way that these components are packaged together. We believe that investment grade bonds have a place in every investor's portfolio because they provide a relatively well-known stream of future cash flows along with diversification benefits, particularly during flights to quality that occur early in recessionary periods. This is evident in Exhibit 3, which shows investment grade bond

Exhibit 3 – Recessions and Capital Market Performance



Source: National Bureau of Economic Research, Barclays

and equity performance during recent recessions. In five of the last six recessions, investment grade bonds outperformed equities, offsetting the negative returns associated with equities during economic retrenchment. In the end, the optimal approach to gaining exposure to investment grade bonds, and fixed income instruments in general, becomes a portfolio-specific solution requiring further analysis.

THE PRIMARY FIXED INCOME RETURN AND RISK COMPONENTS

Before examining fixed income asset allocation, we must first identify the components of risk and return in fixed income. For the purposes of this paper and analysis, we identify three primary and distinct betas, or market-risk exposures, in fixed income instruments: interest rate exposure/duration (scalable through the term structure of rates), convexity (which is usually related to prepayment or call/optionality risk), and credit. There are other important return drivers such as inflation, volatility, and liquidity, but these risks may be associated with, or even components of, the three primary risk exposures.

The Capital Asset Pricing Model (CAPM) tells us that systematic risks, or betas, are the risks that cannot be diversified away by holding a portfolio of similar assets. A beta is a primary market risk for which investors seek compensation. We believe that fixed income betas earn a risk premium, as evidenced by positive Sharpe Ratios over long-term periods; however, excess returns in fixed income have been cyclical, with periods of negative Sharpe Ratios.

Duration: Government bonds such as Treasuries bear duration risk through the term structure of interest rates. Historically, the slope of the Treasury yield curve has been positive, suggesting that investors are compensated for lengthening the duration of the portfolio by investing in longer-dated bonds that pay higher coupon rates. Investors may also choose to hold Treasuries to hedge certain economic outcomes, as nominal government bonds perform well in deflationary environments and during recessions.

Convexity: Agency mortgage-backed securities (MBS) are the most common examples of convexity risk. MBS convexity risk (negative convexity) is categorized by the uncertainty of prepayment speeds on the underlying mortgages. Whether cash flows of principal or interest payments are faster or slower than anticipated, this uncertainty affects the price of the security given a movement in market interest rates. Prepayments on MBS accelerate as interest rates fall, thus causing the negative convexity and reinvestment risk that is usually associated with agency MBS. Paydowns are received at par value while the prices of bonds are rising due to lower interest rates, creating an upper boundary on MBS prices when rates are falling. At the same time, bonds with call options may have greater convexity risk than those without call options. Because of negative convexity, investors demand a return premium to compensate for the uncertainty of future cash flows. Even though Agency MBS are high quality securities implicitly backed by the federal government (low credit risk), yields tend to be higher than Treasuries because of convexity risk.

Conversely, positive convexity is generally a good characteristic for fixed income instruments. Corporate bonds with put options and even plain vanilla coupon bonds may exhibit favorable price movements in both rising and falling interest rate environments. The value of a put option to its holder increases as interest rates rise, providing some protection against falling bond prices. Whether a security exhibits positive or negative convexity, it is an important concept in the price rationalization of fixed income securities.

Credit: All bonds bear some degree of credit risk, which is defined as the risk that a borrower will default on either interest payments or return of principal. In the case of corporate bonds, this risk depends on the creditworthiness of the borrower and the seniority of the security in the capital structure. Credit risk is strongly correlated to equity risk because, in the event of default, a lender essentially assumes an equity position in a borrower through bankruptcy or insolvency. The mispricing of credit in non-agency MBS over the past few years is a good example of how markets can sometimes completely misunderstand credit. Non-agency MBS are not supported by the major government mortgage agencies and thus bear the credit risk of the individual borrowers in the pool. The most recent housing market decline was marked by a reduction in the collateral backing many of the loans (in this case, home equity), which added to the financial burden on home owners and increased defaults and losses. Some non-agency MBS quickly became distressed and highly illiquid as markets moved to re-price.

Credit is a beta that is highly correlated to equities and the general risk appetites of capital markets. Disaggregating bond portfolios should focus on separating credit risk or, at the very least, clearly defining performance expectations for strategies that bear credit risk. Separating credit risk from the other primary fixed income return drivers is probably most beneficial to investors, as we will discuss later in this paper.

Fixed Income Alpha

While these three primary beta factors are often

the dominant drivers of fixed income returns, we believe that alpha can be an important component of returns as well. In credit-related fixed income instruments, returns are asymmetric: the upside is limited simply because the expectation is that a bond will pay back par plus its coupon, but downside returns can be skewed by downgrade, default, or impairment. Alpha can become a larger component of fixed income returns in several market segments:

- More credit-intensive asset classes
- Issues with complex structures
- Less-liquid private markets
- Mandates where leverage, derivative, long-only, and other benchmark-related constraints are loosened

Exhibit 4 displays our assessment of alpha potentials in major fixed income market segments.

NEPC models fixed income portfolios using specific factors similar to those previously identified, which may be scaled accordingly to portfolios. Our move away from modeling investment grade bonds as the BC Aggregate is consistent with our goal to be less benchmark-centric (particularly with a benchmark that may be sub-optimal for many clients) and better able to incorporate the large amount of fixed income product innovation that has recently occurred. We start with a building-blocks approach that allows us to recreate the BC Aggregate by using its component parts, providing us with the ability to develop customized benchmarks/portfolios with varying degrees of duration and credit exposure to meet the specific needs of our clients.

OUR APPROACH TO BOND INVESTING IS DRIVEN BY CLIENT GOALS AND OBJECTIVES

For long-only investment grade bonds, beta exposure should be the primary decision driver, with the assumption that there may be some alpha to be earned, but that it may be ephemeral and not cost effective. In more credit-intensive asset classes such as high yield bonds, leveraged loans, mortgage-related credit, and emerging markets, long-only active managers have demonstrated more consistent excess returns.

A TIME TO RETHINK FIXED INCOME INVESTING

Identifying the factors that contribute to fixed income returns and risk is the first step in an objective-based approach to asset allocation. We recommend an approach to bond investing that's driven by specific client goals and objectives. To identify these goals, we begin with big-picture thinking. Institutional pools of money exist for a purpose: pension funds pay benefits, endowments and foundations fund operating budgets or long-term capital expenditures, and other pools exist to preserve or increase wealth. Plan sponsors should begin by identifying the least risky portfolio that addresses the purpose of the investment pool. For a pension fund, this may be a cash-matched LDI portfolio, or a portfolio of long-dated government bonds. For other portfolios in which liabilities are unknown, inflation may be a primary concern, and preserving purchasing power through T-Bills or TIPS may be the best low-risk approach.

Exhibit 4 – Alpha Potential

Fixed Income Market	Alpha Potential (Net of Fees)
Nominal Sovereign Bonds	Low
Inflation Linked Bonds	Low
Agency MBS	Low
CMBS	Moderate
ABS	Moderate
Investment Grade Credit	Moderate
High Yield	Moderate
Leveraged Loans	Moderate
Emerging Markets Debt	High
Mortgage Credit	High
Distressed	High
Private Markets	High

Fixed Income Advice for Pension Funds

For many pension funds, the least risky portfolio is not an attractive option due to low return potential. Pension funds, depending on their sponsors, operate in various regulatory environments with different accounting rules governing corporate, public, and Taft-Hartley plans. Regardless of the plan sponsor, the fundamental risks of the "Pension Promise" remain the same.

Earning an attractive rate of return on pension assets can help maintain benefit levels for participants while mitigating contribution levels. These goals need to be balanced, however, with maintaining the stability of plan-funded status, since an asset/liability mismatch may represent the greatest financial risk for the plan. While the concept of Liability Driven Investments (LDI) has been in

practice by some plan types for quite some time, in general the US pension system has not completely addressed asset/liability mismatches. Since these mismatches may be mitigated by extending the duration of bonds in the asset portfolio, pension funds should first approach investment grade bonds in the context of offsetting the duration risk of future liabilities. NEPC has published several white papers that highlight the benefits of LDI for pension funds and provide much greater depth on this important concept.[2]

Fixed Income in an Asset Allocation Framework

Investors may choose to depart from the least risky portfolio in order to seek higher expected returns based on their specific circumstances and risk tolerances.

In this case, investors should accept risk in their portfolios only if they can afford to earn worse than the least risky alternative.

Investors hold high-grade nominal bonds to protect portfolios from poor equity performance during recessions and for deflationary environments. Treasuries perform best in this environment, while TIPS and inflation-linked bonds perform well in times of stagflation. In general, however, fixed income portfolios — especially those that are benchmarked against the BC Aggregate — are not invested with these objectives. Therefore, in structuring investment portfolios, particularly fixed income portfolios, we believe that it's critical to keep in mind the potential for these economic environments. Bonds are relied upon during times of market stress, and bond portfolios managed against the BarCap Aggregate may not completely address some of these environments because the various betas are bundled together and may not meet specific plan objectives.

We believe that using fixed income in an asset allocation framework begins with a building-blocks approach that's based on the three key betas identified earlier. High-grade nominal fixed income — including government bonds (both US and foreign developed), securitized bonds, and high-grade corporate credit — are the most price-sensitive to changes in interest rates. High-grade nominal bonds, particularly Treasuries, perform well in a deflationary environment, since the real value of nominal coupons and principal will increase as prices fall in the economy. In determining high-grade duration exposure, we believe that it's important to separate credit beta from this portion of the portfolio. Credit cannot be relied upon to perform well in recessionary and/or deflationary periods because of its correlation to equities.

The duration of high-grade bonds also determines price sensitivity to interest rates: long-duration bonds provide a greater deflation hedge than short-duration bonds. When considering high-grade nominal exposure, portfolio duration should be scaled to the tenor of liabilities and/or volatility tolerances.

Looking back to Exhibit 1, the type of nominal fixed income exposure in your portfolio was critical in the most recent recession, because some parts of the market became highly correlated with equities as the credit crisis deepened and price deflation worsened. If very-high-quality and highly liquid nominal fixed income exposure is an important portfolio objective, then deconstructing the bond portfolio is beneficial in gaining exposure to high-quality assets that diversify equity risk and provide a better deflation hedge. Keep in mind, however, that liquidity in the form of cash or Treasuries is generally expensive, as investors earn lower rates of return from such investments over long-term periods. We recommend that investors perform a liquidity study and consider stress-case scenarios on the entire investment program to help determine how much high-grade fixed income (particularly government bond) exposure is necessary to balance other risk exposures and to help service liquidity needs, particularly during periods of market stress.

Possible solutions include allocating to high-quality global fixed income or indexing Treasuries and agency MBS. High-quality core-aggregate bond allocations may make sense for some plan sponsors, but re-evaluating bond benchmarks and revisiting performance expectations is probably a good idea to get a better sense for deflation protection. Real returns in the form of inflation-linked bonds (TIPS or global inflation-linked bonds) may also be considered if inflation is a concern or if inflation hedging is cheap (when break-even inflation is priced attractively).

In deconstructing high-grade fixed income, investors can create a "bar-belled" approach to the portfolio: high-quality government-related debt as a deflation hedge and source of liquidity (TIPS or nominal sovereign bonds, currency, agency MBS, agency debentures) in separately benchmarked portfolios. Credit, in this framework, is not relied on as an "anchor to windward," but rather as a discrete beta allocation and a source of excess return provided by manager skill. Credit investments perform well during economic recoveries,

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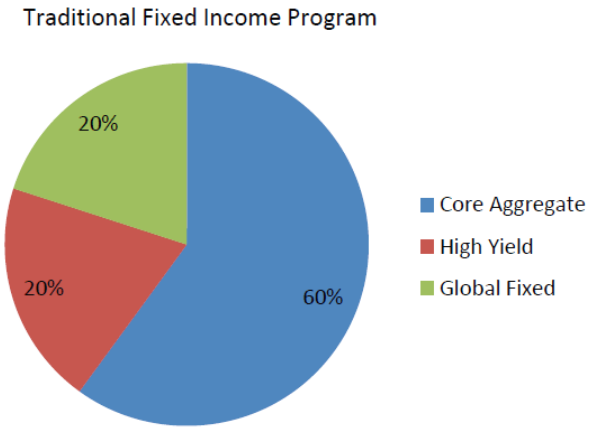
[2] "LDI Product Types and Implementation Strategies" February 2, 2010

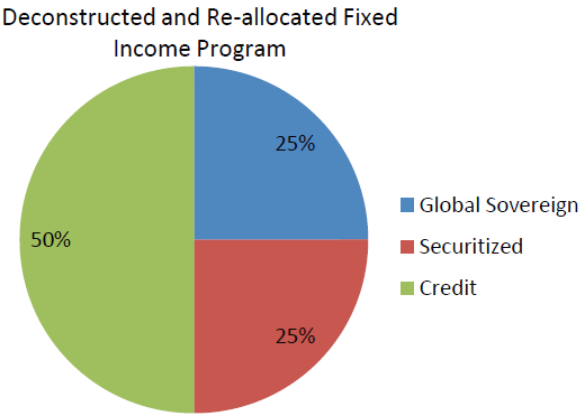
"Understanding Duration Risk in Pension Plans: The Case for LDI" February 2, 2010

"Risk Budgeting: A Focus on a Pension Plan's Biggest Risks" February 2, 2010

All are available at *www. nepc.com*

Exhibit 5 – Portfolio Examples





and increase the yield of the bond portfolio. Separating credit beta from high-grade duration beta achieves the goal of better aligning high-quality fixed income exposure with asset allocation objectives. A mix of active or passive managers would be appropriate in a deconstructed bond portfolio, given our views on the ability of managers to outperform in certain fixed income market segments, as highlighted in Exhibit 4.

Related to scaling portfolio risks, the diversification benefits of fixed income may be magnified through a "risk parity" approach to asset allocation. In a typical portfolio, equity risks dominate the overall portfolio risk, even if equities are diversified across markets. Returns for the portfolio thus become highly correlated to equities. A risk-parity approach seeks to match the contribution to risk of each asset class by leveraging or deleveraging capital allocations to the various asset classes. A resulting risk parity portfolio would typically leverage high-quality fixed income (nominal government bonds and TIPS) to a level that matches the contribution to risk of equities, thus maximizing the diversification benefits of bonds in the portfolio. For a more detailed description of risk parity, please refer to NEPC's white paper on the topic.[3]

Portfolio Example

In Exhibit 5, an investment portfolio of BC Aggregate, high yield bonds, and global fixed income (labeled "Traditional Fixed Income Program) is deconstructed into its key beta components and re-allocated (labeled "Deconstructed and Re-Allocated Fixed Income Program"). In this example, removing benchmarks and mandates allows us to see the expected sector allocations. Notably, the credit component of the deconstructed portfolio is defined as 50%, recognizing that core and core-plus managers could, at times, have high allocations to credit.

In better defining expectations for managers and allocations, the 25% allocated to global sovereign bonds in the deconstructed portfolio serves as the high-quality strategic allocation to intermediate-term duration. This is the very-high-quality interest-rate-sensitive portion of the portfolio that should perform well in a recessionary and/or deflationary environment, and also be a reliable source of liquidity in most market environments. The securitized portion may also fit this mandate, with an added return component coming from the addition of convexity risk. Agency MBS are high-quality securities backed by the major GSEs, and have historically been relatively liquid in most market environments. ABS and CMBS may be an additional component to the securitized bond portfolio, however these instruments may be more credit sensitive and have different liquidity profiles than agency MBS.

Credit has been combined into one mandate that may include investment grade, high yield, and dollar-denominated emerging markets debt. Finding a manager, or managers, that can invest in all of these areas — as well as other market segments such as bank loans, convertible bonds, and derivatives — makes the prospects for active management more attractive.

In this example, credit is primarily a source of return and manager skill, and only secondarily a source of liquidity and protection from recession or deflation.

Removing the BC Aggregate allows for a fresh look at investment grade bonds. An increasing

[3] "Risk Parity: In the Spot Light After 50 Years" March 3, 2010

Available at *www.nepc.com*

number of fixed income products have been launched to address a growing interest in finding alternatives to core or core-plus strategies. In addition to deconstructing the bond portfolio into components, investors may consider evaluating managers that are skilled at managing unconstrained multi-sector fixed income portfolios. Such products invest in many fixed income sectors including investment grade, high yield, leveraged loans, emerging markets debt, and global bonds, and may have greater flexibility in using derivatives or adjusting portfolio duration. These strategies are less benchmark-centric, and more oriented toward generating positive absolute returns.

Opportunistic and unconstrained fixed income products generally maintain long-term strategic allocations to the major fixed income sectors, but have the flexibility to express relative value views across markets and adjust allocations over time. Some products may allow shorting, or use implicit leverage through the use of derivatives. Absolute return fixed income may be managed against LIBOR, or other cash-based or cash-plus benchmarks. A one-stop-shopping approach is a good solution for some clients, particularly small endowments and foundations, who may have a limited amount of resources to allocate to active long-only fixed income managers. Such strategies must, however, be distinguished from a portfolio based on discrete beta exposures. Since unconstrained portfolios have the flexibility to invest broadly, the purpose of investing is based more upon return seeking, alpha generation, and broad diversification, and may not hedge the portfolio against certain economic conditions in the same manner as dedicated high-quality nominal bonds or TIPS.

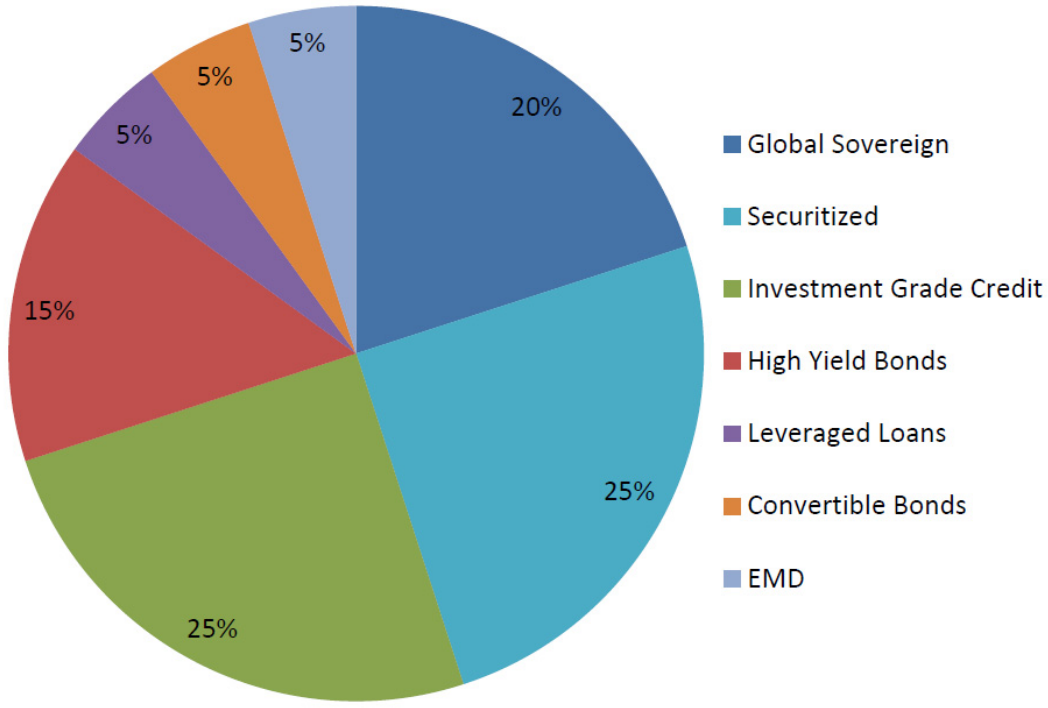
Exhibit 6 is an example of a multi-sector fixed income product. Allocations represent what the portfolio may look like at a specific point in time. Actual allocations may deviate from this representation.

Alpha opportunities in fixed income may be further enhanced by allocating active risk budgets in fixed income instruments to hedge funds or private markets investments. In 2008, NEPC advised clients to create an opportunistic investment mandate and recommended various credit strategies as a unique opportunity based on the market dislocation caused by the global credit crisis. In this example, bonds are positioned as a temporal investment.

Fixed Income in Defined Contribution Plans

It is our observation that fixed income investment options in defined contribution plans are generally underused by plan participants. In a typical DC plan, fixed income options may exist either through a money market fund, stable value fund, or core/core-plus strategy. Participants usually gravitate toward the most conservative option — probably due to a behavioral response associated

Exhibit 6 – Multi-Sector Fixed Income Example



with equity investing — and often shun other fixed income options such as core or core-plus products.

In target-date funds, fixed income is a component of the overall strategy. In funds that are focused on the accumulation stage of a participant's glidepath to retirement, equities are the dominant driver of portfolio risk and return, and fixed income is used in small amounts to offset some of the risks associated with equities. Fixed income plays a larger role as the fund nears its target date, in which preserving capital, income, and addressing inflation are more important objectives than capital growth.

The addition of TIPS or global inflation-linked bonds to savings plans achieves the objective of providing long-term real returns for participants where the primary objective is the preservation of capital and purchasing power. The addition of credit and other fixed income segments may be an interesting option for custom target-date funds, particularly in an environment where expectations for growth and equity returns are low.

Conclusion

We believe that disaggregating core fixed income portfolios is a first step in rethinking the usefulness of bonds in a portfolio. Traditional fixed income investment techniques should either be justified or abandoned in favor of a new approach that specifically aligns investments with portfolio objectives. Building a fixed income portfolio that is aware of liabilities and cash flows and appropriately addresses portfolio diversification — particularly during recession and stagflation — is the most important objective for investors to consider. Embracing a new approach to fixed income requires a few steps:

- Identify the components of fixed income return in your portfolio.
- Address key objectives such as asset/liability mismatches, inflation/deflation protection and disaggregate the portfolio, with a particular focus on separating credit exposure from other fixed income exposures.
- Decide how much Treasury Bond and high-grade sovereign exposure is needed to provide deflation protection and liquidity, while building a "bar-belled" approach to adding other fixed income exposures and active management.
- Consider multi-sector fixed income as a return-seeking alternative to a traditional core/core-plus strategy, but only after addressing the role of dedicated Treasuries or TIPS.
- Setting expectations for fixed income managers is also important. We are generally supportive of relaxing constraints on managers. However, where investments are relied upon for a specific purpose — such as deflation or inflation hedging — portfolio objectives should be aligned with that purpose rather than focused on beating a benchmark.

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- All investments carry some level of risk. Diversification and other asset allocation techniques do not ensure profit or protect against losses.
- The information in this report has been obtained from sources NEPC believes to be reliable. While NEPC has exercised reasonable professional care in preparing this report, we cannot guarantee the accuracy of all source information contained within.
- This report contains summary information regarding the investment management approaches described herein but is not a complete description of the investment objectives, portfolio management and research that supports these approaches. This analysis does not constitute a recommendation to implement any of the aforementioned approaches.