



Russell Research

Title: Real assets for the
defined contribution
menu

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Synopsis: Exploring the impact of adding “Real Assets” to a menu—
assets such as commodities, real estate and listed
infrastructure—as a way to help participants achieve their
long-term goals.

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About the Research

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Real assets for the defined contribution menu

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For generations, the traditional portfolio has mainly consisted of traditional financial assets: Stocks and bonds. Historically, investors have expected returns from these asset classes to both grow over time and preserve purchasing power. Yet today, many analysts expect that stocks will exhibit increased volatility and are forecasting lower returns for the foreseeable future.

Introduction

Because of these potential market headwinds, defined contribution (DC) pension plan participants face a complex challenge: To meet their spending goals in retirement, their portfolios need to achieve consistent real returns above the rate of inflation. But how can they realize improved portfolio performance and, simultaneously, stay within tolerable levels of volatility and withstand inflationary pressures?

We at Russell have researched the problem and are proposing an old/new answer: expanded diversification. We believe that to achieve true diversification, DC plan sponsors now need to move beyond the practice of simply diversifying holdings within the traditional asset classes. By introducing “Real Assets”—assets such as commodities, real estate and listed infrastructure—in their DC investment menu, plan sponsors can better help participants achieve their goals.

In this note, we will make the case for including real assets in DC plan portfolios. We will arm plan sponsors with information to help participants understand the potential benefits these asset classes can bring to a portfolio. We will also give plan sponsors guidance on ways to effectively implement an allocation to real assets.¹

What are “real” assets?

Real assets are aptly named. Think of them as anything you can hold, touch or smell. Drop a real asset on your foot and it will likely hurt you or ruin your shoes. Traditionally, real assets were investments such as oil, gas, real estate, gold and infrastructure; or, more basically, the inputs to the production of physical goods. Twenty years ago, Russell researchers Ernest Ankrum and Chris Hensel more precisely defined real assets as having intrinsic value with the ability to be exchanged for other goods or services of

¹ Leola Ross, Ph.D., wrote “The Re-Discovery of Real Assets” for Russell in 2009. The present paper leverages the Ross studies.

value.² With time, this definition of real assets has expanded to include contracts for less tangible items, such as water or drilling rights. Still, they remain tied to hard assets and are appealing because they provide exposure to compelling long-term trends, including global population and industrial expansion, increased demand for energy, and the secular demand for natural resources in emerging economies.

In looking at what constitutes a suitable investment in real assets for a DC plan, we have identified three primary asset classes:

- **Commodities**, the inputs to the production of other consumer products, include things like grains, precious metals and lumber.
- **Listed real estate**, primarily structured as real estate investment trusts (REITs). REITs typically own and operate income-producing properties, including office buildings, apartments, warehouses and shopping centers. They can provide consistent income streams that are backed by contractual leases.
- **Listed infrastructure**, which includes long-lived assets essential to modern economies, such as toll roads, ports and airports, pipelines, water utilities and electric utilities. These are often long-term, government-backed projects. The companies we believe DC plans should focus on are those that are mature and well established, and that offer potentially high cash flows.

Although they are not technically considered a real asset, we also recommend Treasury inflation-protected securities (TIPS) as a complement to a real assets allocation in a plan menu. TIPS came into existence in the late 1990s, and they remain the most readily accessible security that is directly tied to inflation. TIPS are U.S. government-backed bonds indexed to inflation. TIPS can be an important component of a DC real assets portfolio and can be classified as “capital preservation” assets. We will discuss in detail how this combination of growth and capital preservation assets can work to provide investors with a defensive allocation that helps to protect their portfolios from unpredictable markets.

So why add Real Assets?

Real assets have traditionally been seen as a specialized niche, the purview of the more sophisticated investor better able to cope with their complexity and sometimes illiquid nature. So why now do we recommend real assets for the average DC plan participant?

For starters, in the last several years we have observed an increasing supply of institutional-quality managers who invest in more marketable and liquid real assets categories. This gives DC investors access to real assets in ways that weren't available before.

Further, we know that financial assets have historically performed well over the long term vs. inflation, and thus it has been perfectly logical to suggest that average investors stick with stocks and bonds. However, in the current market environment, stocks and bonds alone can't be expected to always produce a long-term real return. The economic and financial uncertainty we have seen in the global markets – such as divergent growth rates across the developed and emerging economies; global fiscal imbalances; and the impact of unprecedented central bank liquidity injections to world financial markets – have all contributed to volatility in both the stock and bond markets. As a consequence, investors are confronted with a wide range of possible economic outcomes moving forward, including inflationary shocks.

² Ankrim, Ernest, and Chris Hensel. “Exchange Traded Real Assets: Commodities in Asset Allocation” (1992).

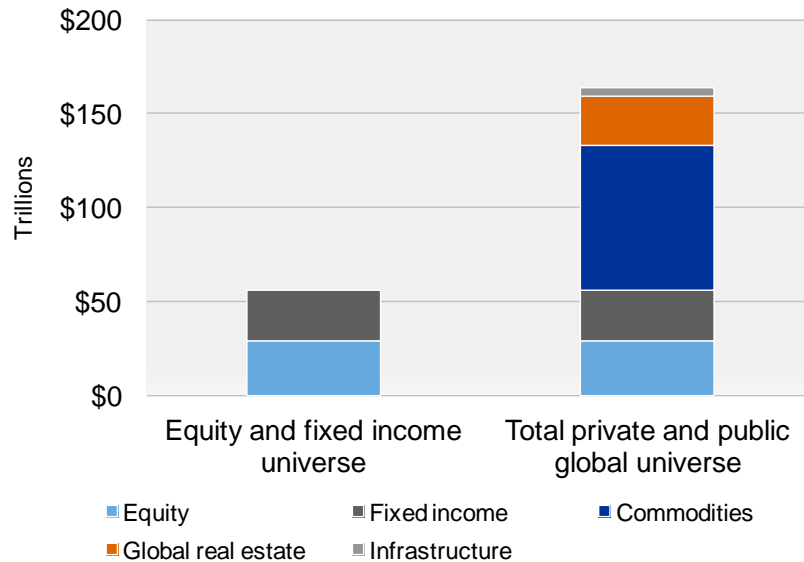
We believe that DC plan participants should position their portfolios to withstand a range of market environments, not just inflationary or deflationary. A truly balanced portfolio, combined with the right savings rate, should give participants a high probability of meeting their retirement goals and provide some protection from the potential erosion of inflation as well. Underpinning our belief are three main principles of real assets investing:

- Real assets are typically underrepresented in a typical portfolio, and the addition of them broadens portfolio **diversification** due to their modest correlation to typical asset classes.
- They increase the potential to achieve a consistent real return above the rate of **inflation** over time.
- They provide a way to enhance potential long-term **returns** by taking advantage of global trends.

ENHANCED DIVERSIFICATION BENEFITS OF REAL ASSETS

Part of the diversification story behind real assets is the fact that DC plans have historically focused their investment options on only the global equity and global bond universes. However, as one thinks about the total global markets portfolio, the traditional equity and bond indices fail to account for all of the investable securities that are available in the world, whether publicly listed or privately held. Although most of the real assets classes are primarily held in private investments (as shown below) and are thus not investable for DC plans, we believe that the opportunity set for investable real assets is large and that it will grow over time.

Exhibit 1: Relative size of the investable liquid asset classes



Source: Sources for Investible Universes: Bloomberg, www.bloomberg.com, Russell Investments, Barclays Capital Indexes, BP Statistical Review of World Energy June 2008.³
 Indexes/universes are unmanaged and cannot be invested in directly.
 Data is as of December 31, 2011 unless otherwise stated. Current data may be different.

³ BP p.l.c., England and Wales. Available online at <http://www.bp.com/productlanding.do?categoryId=6929&contentId=7044622>, Investment Strategy Annual based on \$35-\$60/barrel, LaSalle Investment Management, 2009. JPMorgan Infrastructure Investment Fund: Third Quarter 2008 Report, Keating, Edward. "Global Infrastructure—A 'New' Alternative Asset Class" (Alternative Investment Conference presentation). Lazard Asset Management LLC, April 2008. Sources for assets: Equity: Russell Developed Large Cap Index Net., Bonds: Barclays Capital U.S. Aggregate Bond Index, Real Estate: FTSE EPRA/NAREIT Developed RE Index Net (performance prior to 9/30/07 linked to FTSE NAREIT Equity REITs Index), Commodities: Dow Jones UBS Commodity Index TR, Infrastructure: S&P Global Infrastructure Index Net

We also believe, based on our knowledge and on-going research of investment managers, that managers tend to systematically underweight certain types of equities, such as infrastructure and real estate investment trusts (REITs), even if they are in the benchmarks that they are managing to, because these types of companies are not widely understood, and they often require nontraditional valuation models. Because of these systematic under-representations, DC participants with traditionally allocated portfolios may be missing opportunities that investing in these asset classes can provide.

The prospective increased diversification benefit from adding real assets is seen in the correlation table in Exhibit 3. Real assets have less correlation to financial assets, because they tend to react differently in different market environments. For instance, commodities represent the inputs to production. So in periods where supply may be interrupted by world events, commodities tend to increase in price. While this result is positive for a commodities investment, it may have a negative impact on traditional stocks when the prices of raw materials increase.

Exhibit 2: The Russell Real Asset Model Allocation

Our research led us to design the following model real asset allocation, which we utilized throughout this paper to illustrate the performance of a real asset portfolio. It is defined as 30% commodities, 22.5% global REITs, 22.5% listed infrastructure and 25% Treasury Inflation-Protected Securities (TIPS). (Later in this paper we will explain how we arrived at this model allocation.)

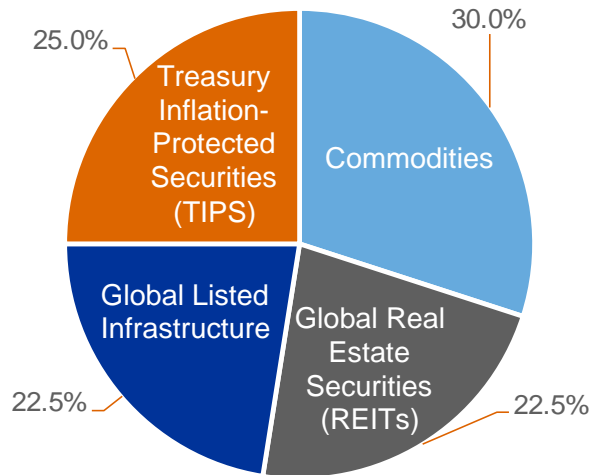


Exhibit 3: Expected correlations of different asset classes

	U.S. stocks	Non U.S. stocks	Bonds	Global infrastructure	Global real estate	Global commodities
U.S. stocks	1.00					
Non U.S. stocks	.72	1.00				
Bonds	.12	.09	1.00			
Global infrastructure	.63	.59	.09	1.00		
Global real estate	.73	.76	.10	.74	1.00	
Global commodities	.30	.29	.06	.53	.41	1.00

Russell Investments capital market forecasts as of 12/31/2011. Please see Appendix for additional information on these assumptions.

We found that a portfolio that also has a 15% allocation to our real assets model shows improved portfolio return and volatility.

The potential benefits of this diversification are further demonstrated when we examine real assets' combined performance during different market conditions. Exhibit 4, below, compares the performance of traditional asset classes, real assets classes and the Russell real assets model allocation in various market environments. When compared to a traditional 60% equities/40% fixed income balanced model allocation, we found that a portfolio that also has a 15% allocation to our real assets model shows improved portfolio return and volatility (as measured by standard deviation).

Exhibit 4: Real assets' annualized historical performance, 1991–2011

	TIPS	REITs	Commodities	Listed Infrastructure	Russell Real Assets Model Portfolio	60/40 Balanced model allocation	60/40 Model + Russell Real Assets Model
Total Return	7.23%	7.97%	5.47%	9.82%	8.03%	6.76%	7.05%
Standard Deviation	6.02%	18.78%	15.01%	13.60%	10.38%	10.44%	10.09%
Sharpe Ratio	1.20	0.42	0.36	0.72	0.77	0.65	0.70

Source: FTSE EPRA/NAREIT Developed RE Index (performance prior to 9/30/07 linked to FTSE NAREIT Equity REITs Index); Dow Jones UBS Commodity Index TR, S&P Global Infrastructure Index, Russell 3000 Index, Barclays U.S. Aggregate Bond Index, Barclays US TIPS Index (Series L). Real assets represents the Russell real asset model allocation of 22.5% global listed infrastructure, 22.5% global real estate, 25% TIPS and 30% commodities. The 60/40 portfolio is represented by the Russell 3000 Index and Barclays US Aggregate Bond Index. The 60% equity /40% bond portfolio plus real assets has a 15% allocation to the Russell real asset model allocation (resulting in a 48% allocation to equity, a 38% allocation to bonds and a 15% allocation to real assets).

Indexes are unmanaged and cannot be invested in directly. Past performance is not indicative of future results.

POTENTIAL TO PROVIDE A POSITIVE “REAL” RETURN

DC plan investors have a particular sensitivity to inflation, because a retiree's liability will be related to the overall level of prices in the market. For decades, investors were told that equities would usually outpace inflation, and over the long term that is likely true. In addition, participants have made allocations to nominal fixed income securities to diversify market risk in their portfolios, but doing so has tended to increase inflation risk.

In Exhibit 5 we look at the “hit rate” of real assets vs. traditional assets over a target of the Consumer Price Index (CPI) plus 3% over different rolling time periods. Exhibit 5

Over rolling 10-year periods, a 60/40 portfolio with a real assets allocation hit a target of CPI+3% nearly 90% of the time. The traditional 60/40 portfolio was able to beat that hurdle just 75% of the time.

clearly shows the value of adding a 15% allocation of the Russell real assets model to a traditional 60% equities/40% fixed income portfolio. Over rolling 3-, 5- and 10-year periods, the portfolio with the Russell real assets model allocation had a consistently higher “hit rate” than did the traditional 60/40 portfolio. More importantly, in every time period examined, the 60/40 portfolio with a 15% allocation to the Russell real assets model beat the target return more often than did a portfolio without real assets. Over a 10-year period, it hit the target almost 90% of the time, vs. 75% for the traditional 60/40 portfolio without real assets.

Exhibit 5: “Hit rate” of various asset classes vs. CPI +3% from 1997 to 2011

	Equities	Bonds	Russell Real Assets Model Allocation	60/40 Model Allocation	60/40 Model allocation + Russell Real Assets Model Allocation
Rolling 3 years	59.3%	73.1%	71.8%	62.0%	64.8%
Rolling 5 years	52.6%	72.4%	69.8%	66.7%	75.0%
Rolling 10 years	63.6%	92.4%	100.0%	75.0%	89.4%

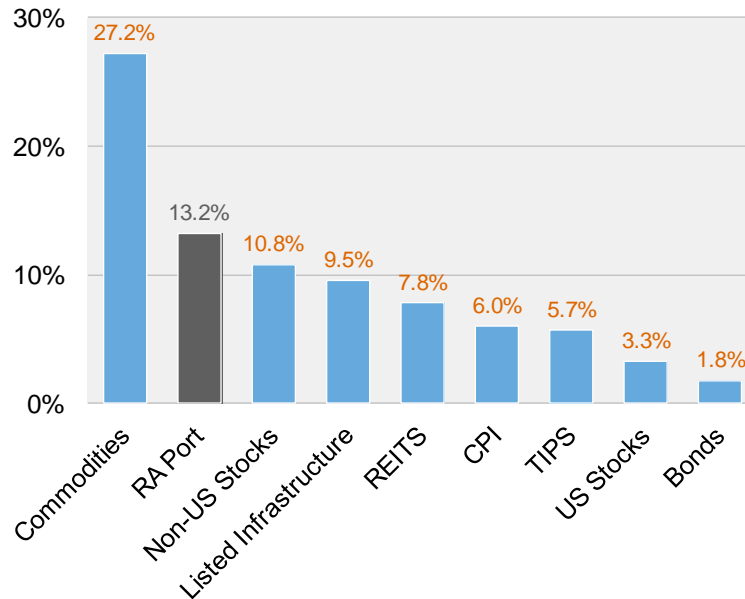
Table indicates percentage of periods of outperformance for the rolling annualized periods shown. Source: FTSE EPRA/NAREIT Developed RE Index (performance prior to 9/30/07 linked to FTSE NAREIT Equity REITs Index); Dow Jones UBS Commodity Index TR, S&P Global Infrastructure Index, Russell 3000 Index, Barclays U.S. Aggregate Bond Index, Barclays US TIPS Index (Series L). Real assets represents the Russell real asset model allocation of 22.5% global listed infrastructure, 22.5% global real estate, 25% TIPS and 30% commodities. The 60/40 portfolio is represented by the Russell 3000 Index and Barclays US Aggregate Bond Index. The 60% equity /40% bond portfolio plus real assets has a 15% allocation to the Russell real asset model allocation.

Part of the reason that real assets can help investors earn a real return is that traditional asset classes have historically performed differently than real assets in different inflationary environments. High inflation is, by our definition, when CPI is greater than 0.7% for a given quarter. During such periods, commodities, REITs and infrastructure were among the best-performing asset classes (see Exhibit 6). In normal inflationary environments (when CPI is lower than 0.7% for a given quarter), commodities were the poorest performing of any of the asset classes we analyzed, but REITs and infrastructure did best.

Even if an inflationary period does not come about, these strategies should provide attractive returns over time. Clearly there are trade-offs, which is why we recommend a balanced approach. In taking such an approach, plan sponsors may be able to help participants reach their long-term goals.

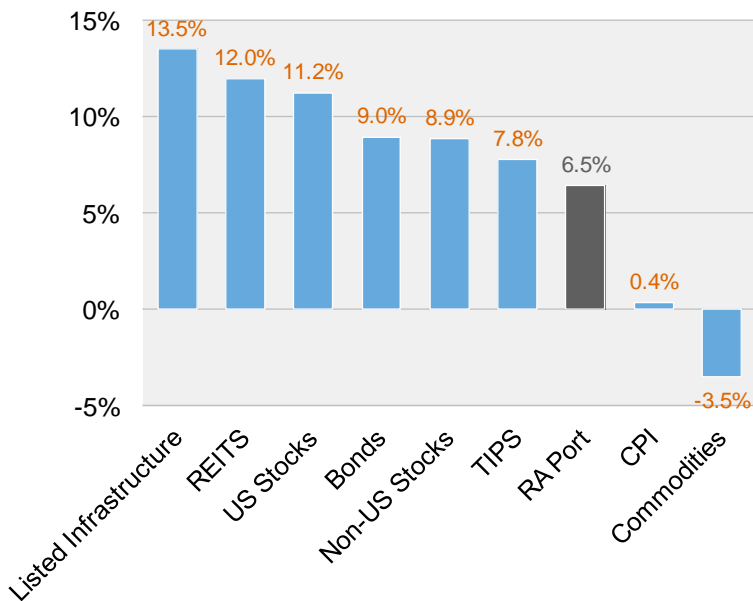
Exhibit 6: Returns during different inflation regimes: 1997–2011

High inflation (periods when CPI is greater than 0.7% for a given quarter).



Data is historical and not indicative of future results
Indexes are unmanaged and cannot be invested in directly.

Normal inflation (periods when CPI is lower than 0.7% for a given quarter)



Data as of 12/31/2011

Data is historical and not indicative of future results. Indexes are unmanaged and cannot be invested in directly.

Source: FTSE EPRA/NAREIT Developed RE Index (performance prior to 9/30/07 linked to FTSE NAREIT Equity REITs Index); Dow Jones UBS Commodity Index TR, S&P Global Infrastructure Index, Russell 3000 Index, Barclays U.S. Aggregate Bond Index, Barclays US TIPS Index (Series L). Real assets represents the Russell real asset model allocation of 22.5% global listed infrastructure, 22.5% global real estate, 25% TIPS and 30% commodities.⁴

⁴ This analysis looked at the average quarterly returns, determined which quarters met the definition of high inflation and then annualized returns from 1997 to 2011, as defined above.

Now let's take a closer look at TIPS and their role in positioning a portfolio to potentially perform well in an inflationary environment, an issue that is often debated and misunderstood. One reason for different opinions is that arguments depend on the framing of the analysis. The purest form of inflation hedging for a specific cash flow is to buy and hold a laddered portfolio of U.S. TIPS until maturity. Yet, DC plan participants cannot buy individual TIPS. The only way for participants to access TIPS is via a TIPS fund, which provides daily pricing and liquidity. In addition to other factors impacting results (see sidebar), you won't necessarily see a TIPS fund having a high monthly correlation to inflation, but it should provide a hedge to a rolling expectation of inflation.⁵ And certainly, relative to nominal bonds (which typically makes up most of a participant's bond portfolio today), TIPS funds should react much more positively to higher expectations of future inflation.

WHAT'S REALLY IMPORTANT: DIVERSIFICATION

So far, we've spent a lot of time talking about a DC plan participant's ability to achieve a real return that will possibly mitigate the effects of inflation. Even though this is an important goal, we should emphasize again that the primary reason for investing in real assets is their ability to create a better-diversified and more efficient portfolio.

To illustrate how a real assets allocation diversifies the sources of risk within a total portfolio context, consider the following example. Imagine two hypothetical portfolios, one with 60% growth assets (U.S. large cap, U.S. small cap, international developed equities, and emerging market equities) and 40% bonds (as defined by the Barclays U.S. Aggregate Bond Index), and another – also with 60% growth assets – that has 12% allocated to commodities, REITs and infrastructure (taken from growth assets) and 3% allocated to TIPS (taken from bonds).⁶ Many investors would assume that the portfolio with the real assets allocation would have a higher expected standard deviation, based on the volatile nature of the individual asset classes, but in actuality, adding real assets slightly reduced the volatility expectations of the portfolio. This analysis shows that the addition of real assets in this manner to the portfolio had a minimal long-term effect on expected risk and return.⁷ Yet what's driving risk and return is more than just what's happening with stocks and bonds. The sources of volatility for the entire portfolio are also driven by other asset classes so the participants experience is not solely reliant on the roller coaster ride that equities puts you on. What's important to recognize is that by adding real assets, the overall volatility of the portfolio did *not* increase, and moreover, the addition reduced the portfolio's reliance on stocks alone as the drivers of returns.

A Detailed Look at the Asset Classes

According to our research, real assets can provide expanded diversification benefits while giving investors opportunities to take advantage of growing global trends. When used in combination with a traditional allocation to stocks and bonds, our research indicates a real assets allocation can potentially reduce overall volatility while

⁵ Collie, Bob. "Do TIPS Hedge Inflation? Of Course They Do," Russell Communiqué, 4th Quarter 2009.

⁶ Asset classes are represented by the following indexes: U.S. large cap (Russell 3000), U.S. small cap (Russell 2000), international developed equities (MSCI EAFE), emerging market equities (MSCI EM), REITs (FTSE EPRA/NAREIT Developed RE Index (performance prior to 9/30/07 linked to FTSE NAREIT Equity REITs Index, commodities (Dow Jones UBS Commodity Index TR), infrastructure (S&P Global Infrastructure Index and TIPS (Barclays Capital US TIPS Index (Series L).

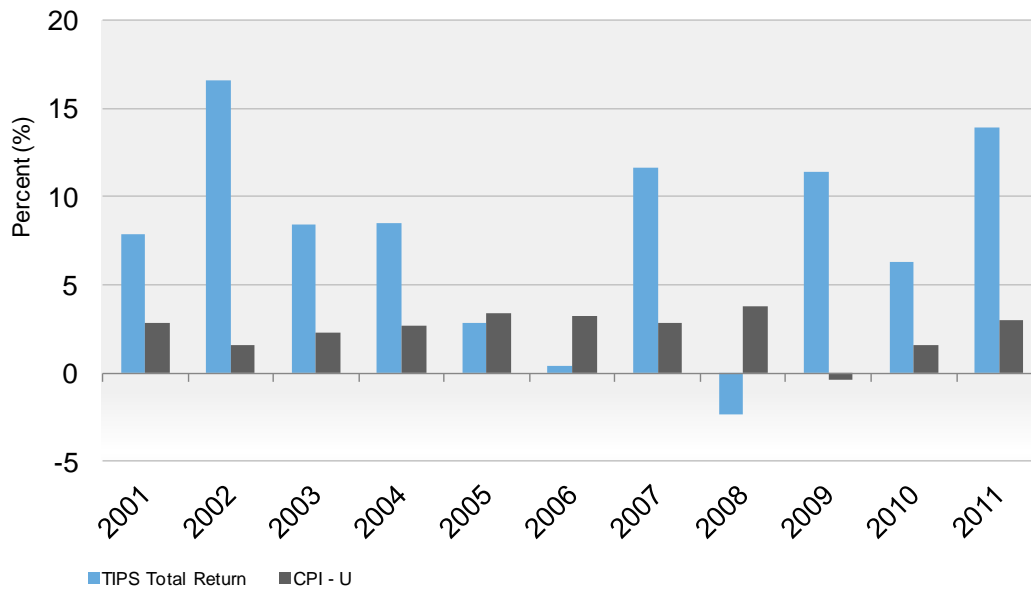
⁷ The first portfolio we describe is 55% U.S. equity, 33.5% international developed markets equity, and 11.5% emerging markets equity as the growth portion, and it has 100% U.S. aggregate bonds as the capital-preservation portion. The second portfolio adds 9% real assets to its holdings, which is approximately 15% of growth assets, and 2% U.S. TIPS, which is approximately 5% of its capital-preservation assets. We added these proportions of real assets and TIPS based on Russell's model portfolio weightings. Based on Russell's capital market assumptions, the portfolio's Sharpe ratio is expected to increase from 0.60 to 0.62, but the contribution to total risk (standard deviation) from U.S. stocks and bonds is decreased from 84% to 64%.

increasing long-term returns. We will now take a more detailed look at each of the asset classes⁸.

The purest way to get access to real assets is via direct investments. A defined benefit (DB) pension plan is able to buy direct investments such as private infrastructure and private or direct real estate. Today, however, the implementation of private assets in a DC pension plan is still challenging. Most DC plans today have daily valuation and liquidity requirements, which limit the real assets choices (note that this daily valuation requirement may change in the future, and more innovative ways to embed less-liquid asset classes in DC plans are being explored). Based on the current constraints, we recommend the following building blocks for a model real assets portfolio: TIPS, commodities futures, global listed infrastructure and global real estate securities. These building blocks, which we discuss below, share three main criteria in addition to daily liquidity: return potential, diversification benefits and some relationship with inflation.

Russell research shows that a TIPS portfolios does not always beat inflation (see Exhibit 7).⁹ There is a difference between investing in a TIPS fund and investing in a buy-and-hold strategy. Additionally, there are other external factors that impact TIPS ability to beat inflation, including market and investor sentiment; actual inflation vs. inflation expectations; the impacts of Federal Reserve actions; supply/demand dynamics; liquidity; the material duration component of TIPS portfolios; and the use of headline CPI instead of core CPI in price calculations. We believe TIPS can play a role in a DC plan as a diversifier, but we think they should be combined with other real assets to provide the best opportunities for investors to meet their stated goals.

Exhibit 7 – Barclays US TIPS Index annual returns vs. annual inflation



Source: Barclays Live, U.S. Department of Labor - Bureau of Labor Statistics
Indexes are unmanaged and cannot be invested in directly. Returns represent past performance, are not a guarantee of future performance, and are not indicative of any specific investment.

⁸Real assets are represented by the following indexes: FTSE EPRA/NAREIT Developed RE Index (performance prior to 9/30/07 linked to FTSE NAREIT Equity REITs Index); Dow Jones UBS Commodity Index TR, S&P Global Infrastructure Index, Russell 3000, Barclays Capital U.S. Aggregate Bond Index, Barclays Capital US TIPS Index (Series L). Standard deviation is used to measure volatility.

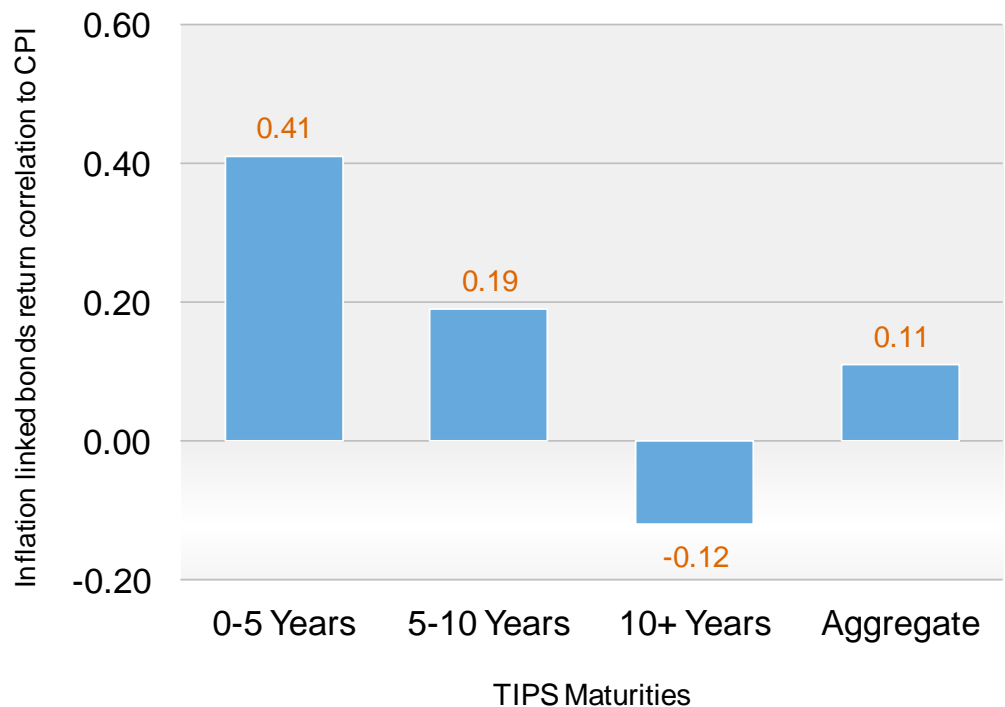
⁹ Dembinsky, Ryan. (2012). "The noteworthy recent behavior of TIPS: Are TIPS (alone) a legitimate inflation hedge?". *Russell Viewpoint*. (March).

TIPS

Treasury inflation-protected securities (TIPS) are essentially sovereign bonds, with the difference that their payout at maturity is indexed to inflation. With only 15 years of data to work with, our knowledge of the asset class is still limited, but we can say a few things about how TIPS have behaved relative to other types of securities. In general, they have behaved similarly to other Treasury securities, and thus have sensitivity to interest-rate movements, monetary and fiscal policy and Federal Reserve actions. Despite TIPS being subject to these fluctuations, if you plan to hold a TIPS fund, chances are that the fund will track inflation expectations pretty well over time. The Barclays U.S. TIPS Index is made up of just 32 issues (as of 12/31/11) that track the broader class of U.S. government-issued inflation-linked bonds.

Of course, the U.S. is not the only country to issue inflation-linked bonds. In fact, U.S. issues make up only about 40% of the nominal value of global inflation-linked bonds outstanding.¹⁰ The efficacy of including global inflation-linked bonds in a U.S. investor's portfolio will be the subject of a future Russell research paper. In the meantime, let's look at how U.S. TIPS can play a role in real assets portfolio construction.

Exhibit 8: Correlations by maturities of inflation-linked bond indexes to CPI; quarterly data January 2002–January 2011



Source: Barclays capital Live and the Bureau of Labor Statistics as of 11/30/11
Data shown is historical and indicative of future results.

Adding even 5% TIPS to a portfolio can impact overall portfolio return and volatility. Also, due to pricing structure, they can provide diversification and an extra layer of inflation protection relative to the rest of a participant's portfolio. When it comes to choosing the correct maturity, we see indications that moderate-maturity (5- and 10-year) TIPS may provide the best trade-off between yield and correlation to inflation. Longer-dated TIPS have historically provided higher returns, but they have done a worse job of correlating with inflation over time than short- or medium-term TIPS.

¹⁰ Source: Barcap Live as of 2/15/2012

COMMODITIES FUTURES

According to Russell's research, the rationale for investing in commodities, which we believe are best represented by the Dow Jones–UBS Commodities Index,¹¹ is that they offer the potential for increased returns, some hedging against specific components of inflation relative to equities, and diversification to the rest of the portfolio.¹² From a return perspective, many economists believe commodities will benefit from global trends such as the rising demand for inputs from emerging markets and from population growth in economies such as China and Brazil. The inflation relationship results from the fact that commodities represent the input prices of raw materials such as oil, natural gas and agriculture, and thus may also have an enormous impact on the final prices of goods and services for the U.S. consumer. Prices are also “sticky,” in that when other securities prices rise or fall dramatically, commodities prices tend to stay put for a while. As we saw in Exhibit 6, their “sticky” prices contribute to commodities being a historically strong performer in periods of rising inflation. Finally, our research indicates that higher commodities prices often translate to higher company costs, just as they represent higher costs for households. As the cost of physical assets goes up, corporate earnings and stock prices often go down. Because of this relationship, the diversification potential of real assets should persist over time, and thus the benefits of including them is expected to persist as well¹³.

What about commodity-related equities?

To provide commodities exposure, plan sponsors could simply seek out commodity-related equities.

We are not convinced that this is the best approach. This exposure is ultimately an investment in the stock of a corporation. As is the case for all equity investments, these securities may be subject to outside market influences, may not effectively pass along profits from commodity price increases and may be impacted by unrelated corporate events. For example, the energy sector could experience an environmental event that drives stock prices down, while at the same time causing a shortage in the supply of energy commodities and, therefore, increasing energy commodity spot prices. Additionally, commodities related equities appear to have a stronger correlation to the equity markets than commodities futures. From 2/1/02 to 12/31/11, commodities related equities had a correlation of 0.71 to US equities, while commodities futures had a lower correlation of 0.42 to US equities.*

Since we have stated that diversification is the first priority for DC participants, we believe commodities futures, a more “pure play” exposure to commodities, may provide better diversification benefits than commodity related equities.

*commodities related equities are represented by the S&P North American Natural Resources Sector Index, commodities futures are represented by the DJ UBS Commodity Index, and US equities are represented by the Russell 3000® Index.

¹¹ For more information about commodities indexes, please see Mark Paris's “A Preferred Benchmark for Evaluating the Performance of Long-Only, Active Commodities Managers” (November 2009).

¹² Kayser, Lee, Leola Ross and Mark Paris. “Structuring a commodities portfolio,” Russell Research (April 2011).

¹³ *ibid.*

It is estimated that US\$40 trillion will be spent worldwide on infrastructure from 2007 to 2027.

Today, tax-efficient real estate investment trust (REIT) structures exist in more than 20 countries, and several more countries are considering implementing REIT legislation.

GLOBAL LISTED INFRASTRUCTURE

Global listed infrastructure, best represented by the S&P Global Listed Infrastructure Index, has the benefit of being broadly diversified across a number of sectors, including toll roads, airports, power generation, utilities and others. Many believe that there will be significant need for investment in infrastructure in the near future, both in emerging markets and in the U.S. The return case for listed infrastructure is probably the most compelling. We know that emerging markets are growing and that the middle class in these countries is the fastest-growing demographic. Additionally, the American Society of Civil Engineers gave the overall condition of U.S. infrastructure a “D” grade in 2009, which is emblematic of a global phenomenon. In response, it is estimated that US\$40 trillion will be spent worldwide on infrastructure from 2007 to 2027.¹⁴

Listed infrastructure companies also have unique characteristics that make them attractive investments. According to Russell research, listed infrastructure investments generally feature steady cash flows derived from tangible, long-lived assets with monopolistic-like pricing power. “Pure play” infrastructure assets – which include toll roads, regulated utilities, airports, seaports, cell towers, etc. – are essential to the fluid, effective functioning of societies, and accordingly feature highly inelastic demand patterns. Infrastructure assets tend to have long lives, and they require significant amounts of capital for development. Over time, we have observed that the distinctive characteristics of infrastructure assets have led to a differentiated risk and return pattern relative to other asset classes.

The long-lived, often monopolistic nature of these assets, combined with their ability to generate cash flows, often translates to lower volatility, lower beta and high dividend yields when compared to other equities. As a result, they are expected to underperform broad equities when equity markets are strong and outperform them when equity markets are weak. To illustrate the inflation relation behind listed infrastructure, consider that most infrastructure firms are highly regulated and have contracts with government entities that may link directly to inflation and can be as long as 100 years.¹⁵ Long-term contracts and stable cash flows over time should be enough to outpace inflation, but there is also a diversification benefit from these types of arrangements.

GLOBAL REAL ESTATE SECURITIES

Today, tax-efficient real estate investment trust (REIT) structures exist in more than 20 countries, and several more countries are considering implementing REIT legislation. In addition, there is a large and growing pool of investable real estate securities available around the world. REIT structures can vary from country to country, but generally they require that the vast majority of investments and income are from real estate assets. While REITs can be unlisted entities, the publicly traded REITs have the advantages of liquidity, transparency and access to capital; private real estate, on the other hand, is difficult to trade and may have little corporate governance. We believe the investable universe is best represented by the FTSE / EPRA NAREIT Developed Markets Index.

While listed REITs are similar to traditional equities, they do offer unique benefits due to their structure that translate to a return and a diversification story. The typical REIT structure provides exemption from corporate taxes due to their mandated dividend payments; for example, in the U.S., REITs are required to pay out at least 90% of net income. The primary argument for including listed real estate in a portfolio is similar to that for listed infrastructure: real estate’s total returns are driven by a combination of a bond-like income component and a capital appreciation component that is linked to

¹⁴ Booz Allen Hamilton, spring 2007

¹⁵ For more information about Global Listed Infrastructure investing, please see “Structuring a Listed Infrastructure Portfolio” by Adam Babson (2011).

demand for space and that usually derives from economic growth. Like listed infrastructure, the cash flows that REITs generate can be high, and stable, during periods of stable or increasing economic growth; conversely when property vacancy rates are increasing and borrowing costs are rising, it is reasonable to expect REIT cash flows to stagnate or decline.

Additionally, REITs also exhibit low correlation to traditional stocks and bonds. A savvy investor might ask, “Aren’t REITs already a part of most equity indexes?” and “Aren’t they equities, too, with consequent higher correlation to broad equities?” The answer to both questions is of course yes. It is for that reason that for DB plans we recommend private real estate and other private assets in addition to REITs. However, REITs do have characteristics that distinguish them from other equities. First, they are investments in real estate assets, which typically don’t trade often, but since the entities are listed on major stock exchanges, they are valued in real time. Second, real estate stocks are also typically underinvested by active equity managers, and as a result have been shown to have a separate and distinct return pattern over longer periods of time vs. broad equities.

REITs may also provide some relationship to inflation during certain inflationary environments. Assuming that the property markets are in equilibrium conditions with respect to supply and demand, two reasons for a relationship to inflation exist: cost pass-through and valuation choices. First, with commercial office leases, owners are often able to pass through to tenants the higher operating costs that may arise due to inflation. In retail, leases may contain rent provisions for a percentage of gross sales; thus, retail property net income could vary based on goods being more expensive during inflationary conditions. Additionally, the valuation method for property may play a part in REITs being tied to inflation. One metric used for valuing properties is replacement cost, such that if construction costs for new buildings increase due to inflationary pressures on raw materials and labor, the value of existing properties could increase as a result of higher replacement costs. These general concepts would not work if there is an oversupply of real estate, because the market sets rents; if there is an abundance of vacant space, rents would not rise, regardless of the inflation rate. Also, when there is much vacant space, there is reduced impetus for new construction, and appraisers would not place much weight on that replacement cost as a valuation metric. Instead, appraisers would focus on comparable sales and a discounted net cash flow method. Thus, overall, we believe REITs should have strong ties to inflation during certain market environments.

Consider adding real assets to a plan’s target date funds or as a stand alone option.

Implementing real assets in a DC Plan

As we discussed earlier, there are three important criteria for including real assets from among our recommended building blocks in a portfolio: return potential comparable to traditional assets, diversification benefits and a positive relation to inflation. Additionally, the need for daily liquidity and cash flows is a prerequisite for DC plans. A summary of those requirements is listed in Exhibit 9.

Exhibit 9: Important criteria for inclusion in a DC plan real assets strategy

	Daily liquidity and cash flows	Modest correlation to stocks and bonds	Comparable return potential to traditional assets	Potential to outperform during periods of rising inflation
TIPS	√	√		√
Commodities	√	√	√	√
REITs	√		√	√
Listed infrastructure	√	√	√	√
Private real estate		√	√	√
Private infrastructure		√	√	√

Real assets in the glide path during the early years of a participant's working life primarily serve as a diversifier.

We've gone through the case for including real assets strategies in a DC plan and have specifically identified the asset classes we believe plan sponsors should consider. The next question is how to effectively add these to DC plans, so that participants can most effectively use them. There are two primary ways to offer real assets as a menu option. The first is via a target date fund. The second is as a stand-alone option. We believe that regardless of which option a plan sponsor chooses, the methodology for determining the asset allocation should remain consistent throughout, because consistency enables individual participants building their own portfolios to use the allocations in the target date fund as a reference point.

REAL ASSETS IN TARGET DATE FUNDS

The foremost premise of our target date fund philosophy is that these portfolios should provide sufficient diversification of risk throughout the glide path. In the early years of a participant's working life, most target date funds allocate 90% or more to risky, or "growth," assets. Traditionally, that has meant equities, but commodities, REITs and listed infrastructure also fall within this category. Real assets in the glide path during the early years of a participant's working life primarily serve as a diversifier. For younger participants, inflation isn't as great a concern as it will be in later years, because their wages should theoretically adjust for inflation over time.

In the later-dated funds (within 10 years of retirement date) the asset allocations need to be more conservative and to become inflation-conscious as participants approach retirement. Thus, it may make sense to start introducing TIPS in greater proportions. There are two reasons for this approach. First, TIPS make the fixed income portion of the portfolio more conservative by reducing the credit risk in the portfolio. Second, the impact of surprise inflation in the years leading up to and going into retirement can eat away at hard-earned savings. Adding more to the TIPS allocation at this point helps to reduce the chances of a negative inflation surprise at the end of a participant's working career. The consequences of high inflation continue to play a role within retirement as well, even though social security (which is also tied to inflation) typically comes into play, so the allocation to TIPS typically remains constant throughout retirement.¹⁶

REAL ASSETS ON THE STAND-ALONE MENU

For those participants who want to build their own portfolios, we need to look for ways to provide the benefits of real assets in an effective manner. For years, the industry has been advocating a smaller fund lineup to prevent choice overload. Potentially volatile and hard-to-understand asset classes are usually the first to be considered as candidates for removal from the lineup. For these reasons, we believe it is not desirable

¹⁶ For more information on target date glide paths, see Grant Gardner and Yuan An Fan's "Russell's Approach to Target Date Funds: Building a Simple and Powerful Solution to Retirement Saving". (2008).

to add the four new asset classes we have described to the fund lineup individually. However, as a portfolio of asset classes, they can make an efficient single portfolio addition to a lineup.

There are often multiple objectives when adding a real asset portfolio. No asset class can address all of these objectives, and no single portfolio today is equipped to handle all of these competing objectives at once. As an example of those trade-offs, consider the low volatility TIPS can offer compared to other asset classes, as well as their low correlation to equities and relatively higher inflation sensitivity. Yet despite these benefits, among the candidates we have discussed in this paper, TIPS offer the lowest expected returns. Similarly, while REITS, listed infrastructure and commodities have relatively high expected returns, they have varying degrees of inflation sensitivity, correlation to equities and volatility. Therefore, investing in a bundled real assets portfolio is very much about managing those trade-offs.

In building a portfolio for the stand-alone menu that is appropriate for a broad spectrum of investors, we examined portfolios with volatility profiles similar to that of a well-allocated participant. The baseline for comparative purposes is a 60% equities/40% bonds portfolio. Our analysis suggests that a real assets portfolio, with a 25% allocation to TIPS (combined with other real assets) will have roughly the same expected return and volatility as the 60/40 without real assets¹⁷. We believe it is important to build a portfolio that has the added benefits of potentially providing a more reliable real return, but that doesn't add to the risk profile of the investor (see Exhibit 10). We found that varying the amount of TIPS in the portfolio caused the most significant differences in expected return and tracking error. This mean-variance analysis informed our base recommendation of a 25% allocation to TIPS. This portfolio accomplishes the two primary goals – increasing both diversification and the potential for a real return – without adding to expected overall portfolio risk.

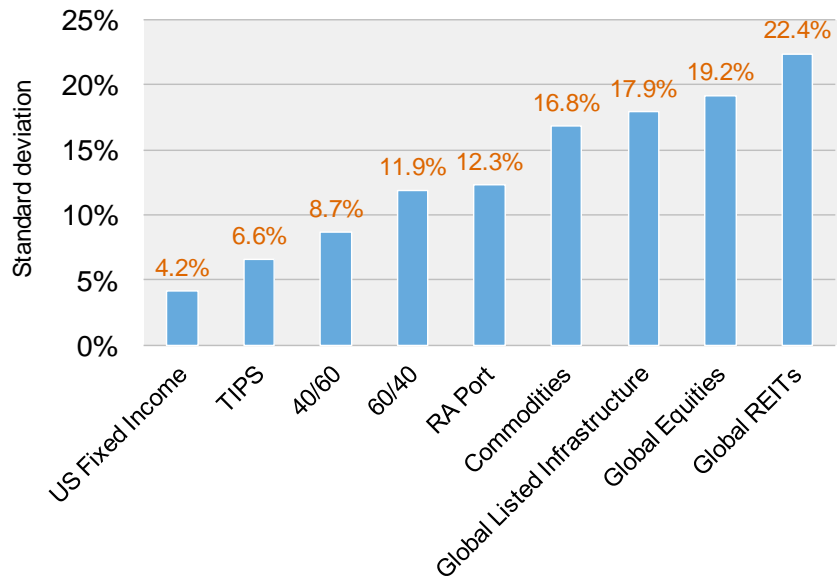
Exhibit 11 provides the allocation scenarios we examined to determine our recommended real assets allocation. The analysis shows that the TIPS allocation in a stand-alone portfolio drives the volatility. Simply put, the more TIPS you add, the lower the expected volatility. Therefore, varying the allocation to TIPS will help a plan sponsor build a portfolio with the right amount of volatility for their participants.

The next component on which to focus is commodities. After TIPS, commodities should, based on Russel's capital market assumptions, have the strongest ties to inflation and the lowest correlation to the rest of the portfolio. It should be noted that while our capital markets assumptions do not include active management potential, we strongly believe that active managers should add value in commodities, infrastructure and global real estate asset classes over time. (please see exhibit 12) For these reasons, we suggest an overweight to commodities relative to listed infrastructure and global REITS. Listed infrastructure had the highest return potential for the time period studied, but also the highest volatility; REITs had high return potential, but also correlated very highly with the 60/40 portfolio. Thus, we believe it is appropriate to assign a lesser weight to both listed infrastructure and global real estate asset classes.

¹⁷ We tested varying degrees of adding TIPS to a basket of real assets, as defined above, starting with 0% and up to 99%. Each was examined in terms of expected and historical return and volatility. The conclusion from our research was that the portfolio with 25% TIPS would have similar return and volatility to a 60% Global Equity, 40% Aggregate bond portfolio.

Exhibit 10: Expected volatility of various real assets classes

20-year expected volatility (annualized)

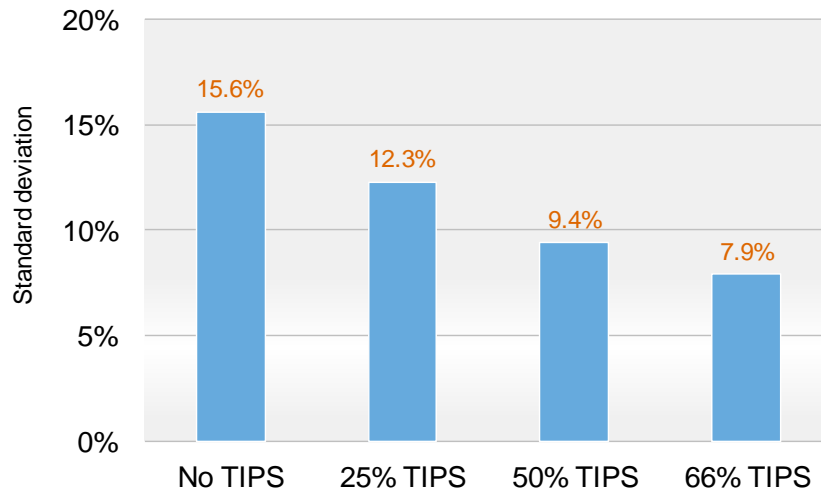


Source: FTSE EPRA/NAREIT Developed RE Index (performance prior to 9/30/07 linked to FTSE NAREIT Equity REITs Index); Dow Jones UBS Commodity Index TR, S&P Global Infrastructure Index, Russell 3000 Index, Barclays U.S. Aggregate Bond Index, Barclays US TIPS Index (Series L). Real assets represents the Russell real asset model allocation of 22.5% global listed infrastructure, 22.5% global real estate, 25% TIPS and 30% commodities. The 60/40 portfolio is represented by the Russell 3000 Index and Barclays US Aggregate Bond Index. The 60% equity /40% bond portfolio plus real assets has a 15% allocation to the Russell real asset model allocation.

Russell Investments capital market forecasts as of 12/31/2011. Please see Appendix for additional information on these assumptions.

Exhibit 11: Expected volatility of different real assets combinations

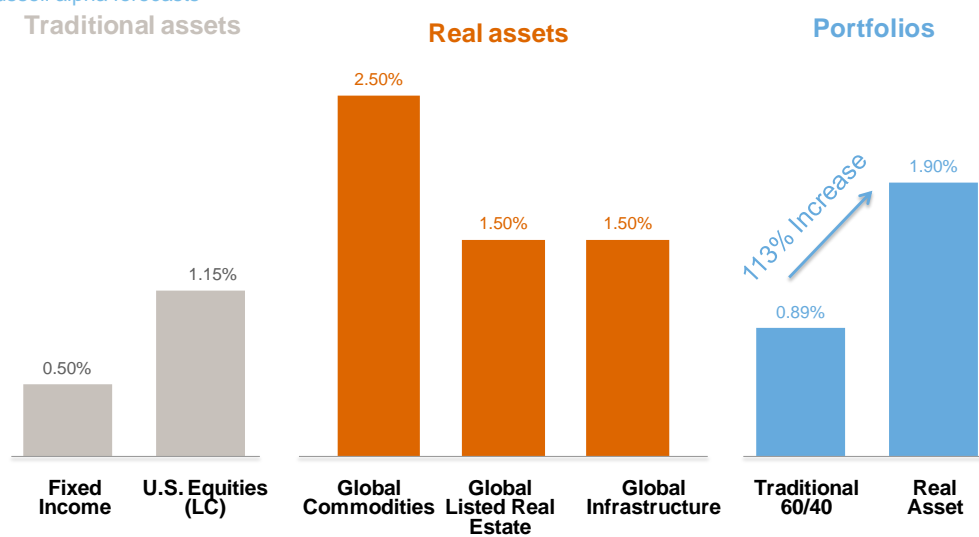
20-year expected volatility



Russell Investments capital market forecasts as of 12/31/2011. Please see Appendix for additional information on these assumptions.¹⁸

¹⁸ Based on our research, the optimal mix of real assets would be 40% commodities, 30% each of global REITs and Listed Infrastructure. This analysis was based on keeping those allocations static relative to each other and varying the allocation to TIPS.

Exhibit 12: Expected return potential of different traditional and real assets
 Russell alpha forecasts¹⁹



Source: Russell Investments 2012

Conclusion: What to offer participants

Now that you are armed with all of this information, as a plan sponsor, you might wonder whether your real assets portfolio will look like the one we have designed. That depends on the participants in your plan. As a plan sponsor, you should ask some fundamental questions when deciding what is suitable for your participants. For instance, what is your participant constituency's likely ability to understand real assets as an investment choice? How well can you communicate the potential risks and rewards of adding the asset class to your participants?

In our experience, answering these questions has led us to a few key conclusions:

- We believe target date funds should include an allocation to real assets that is allocated to infrastructure, real estate and commodities in the early working years, and should begin to add in an allocation to TIPS as participants approach their targeted retirement dates. This approach gives the participants the benefits of diversification throughout the glide path, but also helps them to become more conservative over time.
- A real assets portfolio for a plan's stand-alone menu should be kept relatively simple. To help participants make better choices, plans should offer a streamlined investment menu. A bundled real assets option can help participants increase their diversification, potentially achieve enhanced returns and benefit from protection against inflation.
- We believe real assets are a category wherein there is a significant potential to enhance returns via active management. However, the selection and monitoring of

¹⁹ Please note all information shown is based on assumptions. The long-term expected excess returns employ proprietary projections of the active return potential of each asset class. We estimate the long-term excess return of an asset class or strategy by analyzing current market conditions and historical market trends. It is likely that actual returns will vary considerably from these assumptions, even for a number of years. References to future returns for either asset allocation strategies or asset classes are not promises or even estimates of actual returns a client portfolio may achieve. Asset classes are broad general categories which may or may not correspond well to specific products. Additional information regarding Russell's basis for these assumptions is available upon request. Opinions and estimates offered constitute our judgment and are subject to change without notice, as are statements of financial market trends, which are based on current market conditions. This material is not intended as an offer or solicitation for the purchase or sale of any financial instrument. The views and strategies described may not be suitable for all investors.

the right managers for each asset class is an important aspect of implementing a real assets strategy.

- Plan sponsors should evaluate the potential addition of real assets in the context of their expected volatility. It is important to understand the drivers of volatility in a real assets portfolio, such as in the allocation to TIPS, and to understand as well the nature of the underlying investments.
- There are costs associated with adding real assets. These asset classes are considered specialty classes, and thus they tend to be more expensive. It is important to recognize the potential trade-offs between alpha and fees.

Real assets strategies provide exposure to compelling long-term global trends. Your plan participants face many challenges as they strive to reach their retirement savings goals. Inflation, as well as market volatility, are surely issues they should consider. Although inflation may or may not occur in the foreseeable future, waiting until it does occur may mean “too little too late” in terms of efforts to protect a portfolio against the risk. It is for this reason we recommend a balanced approach to all asset allocation decisions. Investors should have access to portfolio building blocks that perform as well as possible throughout different market cycles and inflation cycles. Over time, we believe that this is the most robust approach for plan participants investing for retirement.

RELATED READING

General

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“Structuring a Listed Real Estate Portfolio.” Brunette, Dave, and Leola Ross. November 2011

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“Structuring a Listed Infrastructure Portfolio.” Babson, Adam. August 2011

TIPS

Russell Communiqué: 4th Quarter 2009. “Do TIPS Hedge Inflation? Of Course They Do.” Collie, Bob.

“The Noteworthy Recent Behavior of TIPS: Are TIPS (alone) a legitimate inflation hedge?” Dembinsky, Ryan. March 2012

Appendix:

CAPITAL MARKET ASSUMPTIONS

United States - Russell Strategic Planning Assumptions summary statistics - data through December 2011

		Equity					Private - Unlisted				Fixed Income								Marketable Real Assets				Other	Economic		
		US Equity	North America Equity	Emerging Markets Equity	Global Equity	Global Equity ex US	Global Private Equity	US Real Estate	Global Real Estate	Global Infrastructure	Long Govt	Govt	Long Credit Fixed	Credit Fixed	Long G/C Fixed	Agg Fixed	TIPS	Cash	LIBOR	Global Commodities	US Listed Real Estate	Global Listed Real Estate	Global Listed Infrastructure	NonDir. Hedge Fund	Inflation	
5 Yr Arithmetic	Return	5.9%	5.9%	7.0%	6.0%	6.1%	7.6%	5.1%	5.1%	4.5%	0.4%	0.8%	1.7%	2.0%	1.1%	1.4%	1.5%	1.3%	1.5%	3.2%	5.5%	5.6%	4.5%	2.0%	2.0%	
5 Year	Volatility	18.9%	20.0%	26.6%	18.2%	19.9%	13.6%	12.6%	10.1%	8.5%	5.8%	2.6%	6.1%	3.6%	5.8%	2.6%	3.0%	1.0%	1.1%	15.3%	25.2%	20.5%	16.5%	4.1%	1.2%	
10 Yr Arithmetic	Return	6.7%	6.7%	7.9%	6.9%	7.0%	8.4%	5.8%	5.7%	5.1%	2.4%	2.4%	3.5%	3.5%	3.0%	2.9%	2.5%	2.2%	2.4%	4.1%	6.5%	6.5%	5.4%	3.0%	2.4%	
10 Year	Volatility	18.8%	19.8%	27.0%	18.2%	20.0%	18.6%	14.8%	11.7%	9.8%	4.6%	2.2%	4.8%	3.1%	4.5%	2.2%	3.7%	2.9%	3.0%	15.4%	25.8%	20.6%	16.5%	4.9%	3.2%	
20 Yr Arithmetic	Return	7.6%	7.5%	8.6%	7.7%	7.8%	9.3%	6.3%	6.3%	5.7%	3.1%	3.1%	4.0%	4.0%	3.6%	3.6%	3.3%	3.1%	3.2%	5.0%	7.2%	7.2%	6.2%	3.8%	2.6%	
20 Year	Volatility	19.4%	20.2%	27.1%	18.8%	20.3%	22.4%	16.4%	13.3%	11.4%	3.5%	3.7%	3.9%	4.1%	3.5%	3.8%	6.0%	5.9%	5.9%	16.7%	26.2%	21.1%	17.5%	7.0%	6.5%	
Correlations																										
Equity	US Equity	1.00																								
	Developed ex North America Equity	0.72	1.00																							
	Emerging Markets Equity	0.66	0.69	1.00																						
	Global Equity	0.92	0.92	0.82	1.00																					
	Global Equity ex US	0.76	0.96	0.85	0.95	1.00																				
Private - Unlisted	Global Private Equity	0.81	0.82	0.73	0.89	0.85	1.00																			
	US Real Estate	0.51	0.44	0.37	0.51	0.45	0.49	1.00																		
	Global Real Estate	0.63	0.72	0.58	0.72	0.72	0.71	0.85	1.00																	
	Global Infrastructure	0.53	0.50	0.48	0.57	0.54	0.54	0.53	0.59	1.00																
	Long Govt	0.02	0.03	0.04	0.03	0.04	0.05	-0.04	-0.03	-0.07	1.00															
Fixed Income	Govt	0.04	0.03	0.02	0.04	0.03	0.00	0.03	0.02	0.06	0.67	1.00														
	Long Credit Fixed	0.13	0.10	0.10	0.13	0.11	0.13	0.02	0.03	-0.01	0.83	0.60	1.00													
	Credit Fixed	0.19	0.12	0.10	0.16	0.13	0.12	0.11	0.10	0.12	0.45	0.69	0.65	1.00												
	Long G/C Fixed	0.08	0.08	0.07	0.09	0.08	0.10	-0.01	0.00	-0.04	0.95	0.66	0.96	0.58	1.00											
	Agg Fixed	0.12	0.09	0.07	0.11	0.09	0.06	0.09	0.08	0.12	0.56	0.94	0.83	0.81	0.82	1.00										
	TIPS	0.05	0.04	0.02	0.05	0.03	-0.01	0.09	0.08	0.14	-0.14	0.12	-0.11	0.10	-0.13	0.18	1.00									
	Cash	0.03	0.01	-0.02	0.01	0.00	-0.07	0.05	0.05	0.12	-0.47	0.02	-0.36	0.06	-0.43	0.13	0.58	1.00								
	LIBOR	0.02	0.01	-0.02	0.01	0.00	-0.07	0.05	0.06	0.12	-0.48	0.01	-0.40	0.03	-0.46	0.11	0.57	0.99	1.00							
	Marketable Real Assets	Global Commodities	0.30	0.29	0.35	0.34	0.34	0.30	0.31	0.35	0.47	-0.08	0.02	-0.02	0.06	-0.05	0.06	0.13	0.14	0.13	1.00					
		US Listed Real Estate	0.60	0.52	0.42	0.59	0.52	0.53	0.87	0.77	0.58	0.01	0.03	0.07	0.13	0.04	0.09	0.07	0.00	0.00	0.36	1.00				
Global Listed Real Estate		0.73	0.76	0.65	0.81	0.78	0.73	0.77	0.89	0.63	0.03	0.04	0.10	0.13	0.07	0.10	0.05	-0.02	-0.02	0.41	0.89	1.00				
Global Listed Infrastructure		0.63	0.59	0.57	0.68	0.63	0.59	0.58	0.64	0.87	0.01	0.07	0.09	0.16	0.05	0.13	0.10	0.03	0.03	0.53	0.66	0.74	1.00			
Other	NonDir. Hedge Fund	0.46	0.44	0.44	0.50	0.48	0.40	0.26	0.36	0.37	-0.26	0.00	-0.14	0.10	-0.20	0.10	0.32	0.58	0.58	0.49	0.27	0.37	0.38	1.00		
	Inflation	0.03	0.01	-0.01	0.02	0.01	-0.03	0.07	0.06	0.13	-0.31	-0.01	-0.25	0.00	-0.29	0.06	0.87	0.69	0.69	0.13	0.03	0.02	0.07	0.38	1.00	

Yields		Yield	Duration	Quality
Yields	Long G/C Fixed	4.3	14.5	AA
	Agg Fixed	4.2	5	AA
	US Long Credit	4.8	13	A
	US TIPS	1.2	4	Govt

Correlation values shown are for the 10-year forecast horizon.

Capital, Bloomberg, and Consensus Economics, Inc. The summary statistics presented in this document are not intended for use in mean-variance optimization. Please contact an associate in the Russell Forecasting and Simulation group to obtain the appropriate numbers.

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Sharpe Ratio: Measures risk-adjusted performance and is calculated by subtracting the risk-free rate - such as that of the 10-year U.S. Treasury bond - from the rate of return for a portfolio and dividing the result by the standard deviation of the portfolio returns. The Sharpe ratio provides an indication on whether a portfolio's returns are due to investment decisions or are a result of excess risk. The greater a portfolio's Sharpe ratio, the better its risk-adjusted performance has been. A negative Sharpe ratio indicates that a risk-less asset would perform better than the security being analyzed.

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