

The Role of REITs and Listed Real Estate Equities in Target Date Fund Asset Allocations



National Association of Real Estate Investment Trusts®



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SUMMARY

The analysis presented in this paper evaluates the appropriate role of commercial real estate equity investment through listed REITs and real estate securities in the glide path asset allocations of target date funds. Based on the data and analysis summarized throughout the paper, we demonstrate that an allocation to U.S. or global listed REITs and real estate equities increases the expected long-term investment performance and diversification benefits of a retirement savings and investment portfolio, and in particular, a target date investment portfolio. Using both mean variance optimization and surplus optimization, the nearly 40-year historical record of investment performance demonstrates that optimal allocations to commercial real estate, either in U.S. listed REITs alone or including both U.S and non-U.S. listed REITs and real estate securities, range from five percent to eight percent for investment horizons of five to 10 years and as much as 18 percent for investment horizons of up to 40 years. As the investment horizon lengthens, increasing allocations to U.S. or global listed REITs and real estate securities are accompanied by shrinking or zero allocations to U.S. TIPS, high yield bonds, and U.S. small cap equities, indicating that listed REITs and real estate securities provide a more efficient asset class for adding to the glide path the investment attributes of high and stable income, long-term capital appreciation, and inflation protection. This analysis supports the case that the target date fund glide path should include a meaningful allocation to the commercial real estate asset class through U.S. or global listed REITs and real estate securities of at least five percent to 18 percent.



INTRODUCTION

For many years, a large proportion of retirees have received an appreciable share of their retirement income in the form of an annuity from a public or corporate employer-sponsored pension fund. Such pension funds also are known as *defined benefit (DB)* plans because they typically guarantee to pay each retiree a monthly annuity benefit based on a well-defined formula known in advance of retirement. During their employment years, employees and their employers typically agree to a schedule for making periodic financial contributions to the plans, and professional investment managers employed by the plans oversee investment decisions on behalf of the employees (plan beneficiaries), including asset selection, asset allocation, risk management, and portfolio diversification. The goal of each plan and its managers is to provide beneficiaries a guaranteed annuity to fund, at least in part, their living expenses during retirement years. If a plan occasionally falls short of this goal, the employer (plan sponsor) generally is obligated to make supplemental contributions to the plan to adequately fund the annuity payments. Thus, the employer bears the financial risk of the investment portfolio.

In recent decades, the number of employees covered by an employer-sponsored DB plan has been shrinking. In many cases, plan sponsors no longer are willing or able to assume the financial risk of underwriting such plans. In addition, employees today often find themselves working for many different employers during their working careers, seldom remaining with one employer long enough to become a fully vested beneficiary of the employer's DB plan.

As the prevalence of defined benefit plans has declined, employers increasingly have offered their employees tax-advantaged *defined contribution (DC)* plans as an alternative for defined benefit plans to save and invest for retirement. During their employment years, employees and their employers typically still make periodic financial contributions to the plans, but the contributions in most cases are optional and each employee (plan participant) is responsible for determining how much to contribute each year to the plan. Each employee also is responsible for determining how the accumulated savings are invested among the asset choices made available through the plan. At retirement, the employee is entitled to begin liquidating assets in the plan to provide retirement income. However, unlike the annuity received from a DB plan, there is no guarantee that the wealth accumulated by each employee in the DC plan will be adequate to provide retirement income over the employee's remaining life. Thus, the employee bears the financial risk of the investment portfolio.

Available data indicate that DB plans generally have earned higher investment returns than DC plans. According to the most recent Towers Watson analysis related to this topic, DB plans outperformed DC plans by an average of about one percentage point per year based on asset-weighted median rates of return for the period 1995-2008.¹ The data also reveal that the outperformance of DB plans typically increases during bear markets because DB plans hold more diversified investment portfolios with lower overall equity allocations. In 2008, for example, DB plans outperformed DC plans by approximately 2.7 percentage points, although asset-weighted median rates of return were negative for both types of plans.



Because many employees are poorly equipped to make appropriate investment decisions and manage the financial risk of their investments in a DC plan, sponsors of such plans have sought in recent years to provide their employees with investment products designed to replicate, in part, the investment decisions typically made by the professional investment managers of DB plans, including asset selection, asset allocation, risk management, and portfolio diversification. Owing in part to provisions of the Pension Protection Act of 2006, the most common of these investment products are popularly known as target date funds (TDFs), which use a professionally designed protocol – the *glide path* – to determine the assets in which to invest and how much of the accumulated savings to invest in each asset. Each TDF is associated with a target calendar year corresponding approximately to the year in which the employee expects to retire. Based largely, but not entirely, on the target date, the glide path automatically adjusts asset allocations over the lifetime of the employee to accommodate the changing levels of risk investors can (or should) tolerate throughout their careers and into retirement.

The purpose of this analysis is to determine the appropriate role of different major asset classes in the TDF glide path, specifically the role of real estate investment through listed REITs and real estate securities. Based on examples and illustrations throughout the paper, we at Wilshire Funds Management demonstrate that an allocation to listed REITs can be expected to make meaningful contributions to the long-term investment performance and diversification of a retirement portfolio, and in particular, a TDF retirement portfolio.

COMMERCIAL REAL ESTATE INVESTMENT

Commercial real estate has long been recognized as an important asset class in the asset allocation policies of the largest institutional investors, often referred to as the “smart money.” Over the past decade, real estate investment has also become more widely embraced by other informed investors, both institutional and individual. In particular, listed real estate investment trusts (REITs) have gained popularity among prominent investors because of their investment performance record, liquidity, and potential portfolio diversification benefits. In 2003, the IBM 401(k) plan, the largest private-sector defined contribution plan in the U.S., introduced a REIT index fund to its “life strategy” (target-risk) funds, and subsequently offered a listed REIT fund as a core fund option in 2004. In 2005, David Swensen, Yale University’s CIO, advocated for meaningful listed REIT allocations for individual investors.²

Institutional investors typically invest in commercial real estate equity through direct property investment, private equity real estate funds, and REITs, of which the latter facilitate the indirect ownership of real estate properties, most often through liquid securities traded in public equity markets. Most REITs are companies that own and, in most cases, manage and lease, investment-grade, income-producing real estate, including, but not limited to, office buildings, apartments, shopping centers, hotels, health care facilities, and warehouses. Some REITs, however, do not own property, but provide credit financing for residential or commercial real estate through investment in mortgages or mortgage-backed securities.



Like Verizon in the telecommunications business, Intel in microprocessors, or Caterpillar in heavy equipment, REITs are companies in the real estate business. Because of their liquidity and relatively low cost, many investors find the most practical way to invest in the real estate asset class is through *publicly traded*, or *listed*, REITs. For example, defined contribution retirement plans and other post-employment benefit trusts require significant, if not daily, liquidity and market pricing. Some investors also invest in REITs that are not publicly registered or publicly traded (*private* REITs) or in REITs that are publicly registered but not publicly traded (*public non-listed* REITs). In addition, defined benefit pension plans and some other institutional investors often face a more complex opportunity set of real estate investments, including direct real estate investments, private equity funds, and REITs.

Real Estate Investment through REITs

The U.S. Congress passed the Real Estate Investment Trust Act of 1960 (“the 1960 REIT Act”) to encourage the formation of REITs as a way for small investors to secure the economic benefits of commercial real estate investment that normally had been available only to those with large financial resources.³ The 1960 REIT Act established certain guidelines and obligations as part of the U.S. Internal Revenue Code that companies must follow when they elect to operate as a REIT. Among these guidelines and obligations are certain rules ensuring that REITs are and remain in the real estate business. For example, at least 75 percent of a REIT’s total assets must be invested in qualifying real estate assets, including interests in real property, interests in mortgages on real property, shares in other REITs, government securities, or cash. In addition, at least 75 percent of a REIT’s gross income for the taxable year must come from real estate-related income, including rents from real property, interest on obligations secured by mortgages, dividends from shares of other REITs, and gains from the sale of real property.

Importantly, REITs also are required to distribute annually to their shareholders at least 90 percent of their *taxable income*, excluding capital gains. In return, a REIT is permitted to deduct from its taxable income each dollar distributed as dividends to its shareholders, often referred to as a *dividends-paid* deduction. Thus, each dollar distributed in the form of dividends is not taxed at the corporate level, but rather is taxed at the individual shareholder level, thereby subjecting the income to a single level of taxation. The income distribution requirement of REITs serves as an important investment characteristic distinguishing REITs from most other types of equity and fixed income investments available to investors. Consequently, investments in REITs typically generate higher dividend yields relative to other equity investments with similar risk profiles.

REITs typically are classified as either equity REITs or mortgage REITs. Equity REITs primarily own, manage, and lease investment-grade, income-producing real estate, whereas mortgage REITs primarily own portfolios of residential or commercial mortgage loans or mortgage-backed securities.⁴ Equity REITs account for a large majority of publicly traded REITs, with 122 companies and a combined equity market capitalization of \$415 billion as of July 31, 2011,



compared with 23 mortgage REITs having a combined equity market capitalization of \$42 billion.⁵

The Early Years: 1960s-1970s

The legislation that first created REITs in 1960 allowed REITs to both acquire and own their properties but did not permit the companies to provide the services customarily required to effectively operate and manage their properties. Thus, REITs found it necessary to hire third-party, property-level managers whose own economic interests were not necessarily fully aligned with those of the REITs' shareholders. Moreover, the low interest rate environment that persisted throughout the late 1960s and early 1970s provided an especially favorable environment for mortgage REITs. Borrowing at low short-term rates to finance longer-term, higher rate construction and development loans, mortgage REITs had strong returns during this period. Hybrid REITs, which combined the investment strategies of both equity and mortgage REITs, also experienced strong returns during this period. (Hybrid REITs were discontinued as a distinct investment sector at the end of 2010.)

As illustrated in Figure 1, the number and total equity market capitalization of mortgage REITs and hybrid REITs combined accounted for the majority of the REIT industry in the early years. However, inflation accelerated rapidly in 1973 and 1974, leading to a sharp rise in interest rates, with short-term rates rising appreciably higher than longer-term rates. Faced with sharply higher financing costs that outpaced loan rates and a recession that resulted in many developers defaulting on their loans, mortgage REITs suffered severe losses, forcing some to close.

Equity REITs also suffered from the economic downturn as well as the troubled real estate market, but they were not as exposed to changes in the yield curve as were mortgage REITs and some hybrid REITs, and their losses were less severe. On balance, the 1970s witnessed a clear shift in the profile of the REIT industry. As the equity market capitalization of mortgage REITs declined by 34 percent, from \$571 million at the end of 1971 to \$377 million at the end of 1979, the equity market capitalization of equity REITs more than doubled, from \$332 million at the end of 1971 to \$744 million at the end of 1979.⁶

Figure 1
Publicly Traded REITs - Number of REITs

Year Ending December 31,	Equity REITs	Mortgage REITs	Hybrid REITs	Total
1971	12	12	10	34
1972	17	18	11	46
1973	20	22	11	53
1974	19	22	12	53
1975	12	22	12	46
1976	27	22	13	62
1977	32	19	18	69
1978	33	19	19	71
1979	32	19	20	71

Publicly Traded REITs - Market Capitalization
(Millions of dollars)

Year Ending December 31,	Equity REITs	Mortgage REITs	Hybrid REITs	Total Market Cap
1971	\$332	\$571	\$592	\$1,494
1972	\$377	\$775	\$729	\$1,881
1973	\$336	\$517	\$540	\$1,394
1974	\$242	\$239	\$232	\$712
1975	\$276	\$312	\$312	\$900
1976	\$410	\$416	\$483	\$1,308
1977	\$538	\$398	\$592	\$1,528
1978	\$576	\$340	\$496	\$1,412
1979	\$744	\$377	\$633	\$1,754

Source: National Association of Real Estate Investment Trusts® (NAREIT)

Barriers to Growth Removed: 1980s-1990s

As the 1970s came to a close, equity REITs were poised for further growth. However, that growth came slowly in the face of considerable economic and financial headwinds. As noted, REITs were prohibited by the 1960 legislation from simultaneously owning and effectively managing their assets, requiring them to hire third-party, property-level managers which created the potential for conflicts of interest between the third-party managers and REIT shareholders. In addition, REITs found themselves at a competitive disadvantage when looking to raise new equity capital because of the range of tax benefits afforded real estate limited partnerships



(RELPs). At the time, RELPs used aggressive depreciation schedules plus tax deductions for interest payments and real estate taxes to create tax losses, which could be used by the limited partners to shelter other types of income. From their beginning in 1960, however, REITs have never been permitted to pass losses or tax credits through to their shareholders, as is the case for most other corporations.

The 1986 Tax Reform Act largely remedied both of these competitive disadvantages. First, it expanded the customary services REITs were permitted to provide to include those services typically required for responsible and effective real estate investment and management. After its experience with “tax loss” oriented real estate investment in the 1980s, the goal of Congress in making this change to the REIT rules was to move the business of real estate investment onto a more “income” oriented foundation and pave the way for REITs to operate as true, vertically integrated operating businesses. Second, it curtailed the tax benefits of RELPs by limiting the use of passive losses to offset active sources of income and by requiring the use of far more conservative real estate depreciation schedules. Thus, the Tax Reform Act of 1986 created a more competitive landscape for attracting capital and made REITs potentially more attractive to real estate investors.

Unfortunately, the curtailment of RELPs for capital-raising to finance new construction did not come quickly enough to forestall massive overbuilding of commercial real estate in the 1980s, which also was spurred on by a marked decline in credit underwriting standards and an increase in real estate lending by banks and savings institutions. The overbuilding led to sharply higher vacancy rates and lower rents in the late 1980s and early 1990s, with the ensuing decline in property values and losses on real estate loans leading to unprecedented failures of commercial banks and savings institutions.

However, the real estate depression and savings and loan crisis of the late 1980s and early 1990s also set the stage for a period of unprecedented growth for REITs. Many real estate owners were burdened by excessive amounts of debt that needed to be refinanced or repaid. Yet, most of the traditional sources of commercial real estate debt, including banks, savings and loans, pension funds and insurance companies, had withdrawn from the market in the face of steep losses. In desperate need of additional equity capital to remain solvent, many of these real estate owners elected to take their companies public in the form of a REIT and use the proceeds from their initial public offering to reduce or repay their outstanding real estate loans. From the end of 1990 to the end of 1997, the number of publicly traded equity REITs jumped from 58 to 176, and their combined equity market capitalization expanded at a 57 percent compound annual rate, from \$6 billion at the end of 1990 to \$128 billion at the end of 1997.

U.S. REITs Today

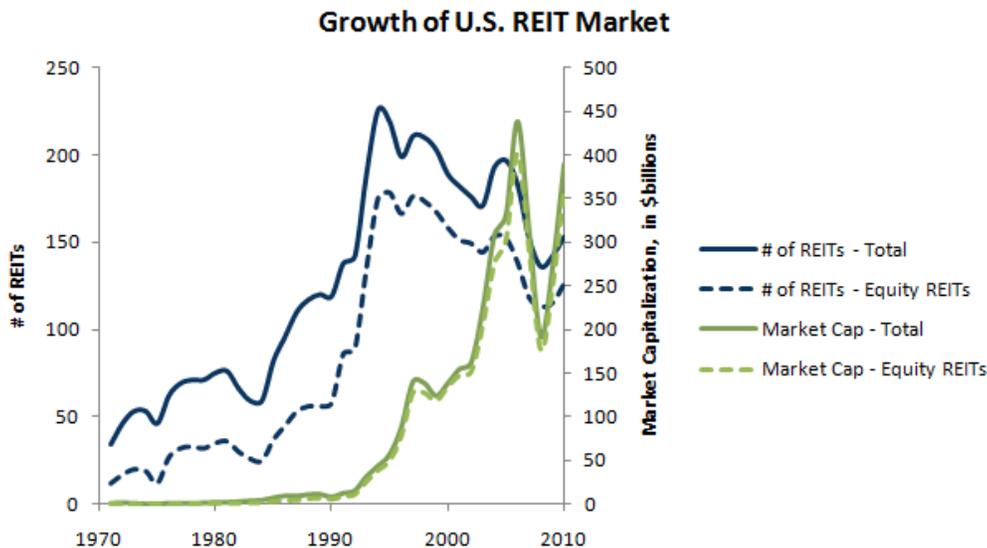
There are estimated to have been about \$6.6 trillion of institutional-grade commercial real estate assets in the U.S. at the end of 2010.⁷ Of the total, publicly traded equity REITs own at least 10 percent or \$600 billion, putting the industry in position for further growth. As illustrated in Figure 2, the size of the REIT market has grown significantly, with the number of publicly traded REITs

more than quadrupling from 34 at the end of 1971 to 153 at the end of 2010 and equity market capitalization multiplying 260 times from \$1.5 billion at the end of 1971 to \$389.3 billion at the end of 2010.⁸

Like nearly all sectors of global capital markets, REITs were negatively affected by the financial crisis of 2008-2009, but REITs have been one of the best performing asset classes since the market bottomed in early March 2009. For the trailing 12-month period ending June 30, 2011, the FTSE NAREIT US All Equity REITs Index delivered a total return of 34.1 percent, compared with a total return of 30.7 percent for the S&P 500 Index.

Figure 2

Growth of U.S. REIT Market: 1971-2010



Source: NAREIT (based on annual data)

Global Listed Real Estate Investment

The development of publicly traded REITs in other countries has lagged that of the U.S. After the establishment of REITs in the U.S. in 1960, New Zealand and the Netherlands enacted REIT legislation in 1969, followed by Australia in 1971. The introduction of REITs in other countries was not seen again until the 1990s and early 2000s. The rules adopted in each country for governing the corporate organization, financial structure, and business operations of REITs are more or less aligned with those of the U.S., and a common feature among all of them is that most of the company's income (as defined by national accounting standards) must be distributed to shareholders as dividends. Today, approximately 40 countries have some type of

REIT model in place, with about a half dozen other countries reportedly considering REIT-like business models.

Importantly, the market for listed real estate companies outside the U.S. extends beyond REITs. Some countries have not yet enacted legislation creating REITs, but still have active markets for listed real estate companies. Other countries have both REITs and non-REIT real estate companies listed and traded on public markets. Including both REITs and non-REITs, the U.S. leads the world in market size with \$374 billion in (free float) equity market capitalization as of July 31, 2011, followed by Hong Kong with \$118 billion and Japan with \$82 billion according to the FTSE EPRA/NAREIT Global Developed Real Estate Index (Figure 3).⁹

Figure 3



Source: FTSE EPRA/NAREIT Global Developed Real Estate Index Series
Monthly Statistical Bulletin July 2011, European Public Real Estate Association (EPRA)

By geographic region, North America has the largest listed real estate market in terms of the number of companies and total equity market capitalization. As shown in Figure 4, North America has a total of 129 companies and \$416 billion (48.0 percent of the index). Asia is second with 72 companies and \$309 billion (35.7 percent), and Europe is third with 86 companies and \$142 billion (16.3 percent).¹⁰

Figure 4
Global Listed Real Estate Market by Major Geographic Region

	Number of Listed Real Estate Companies	Index Market Cap, in billions
North America	129	\$416
Asia	72	\$309
Europe	86	\$142

Source: FTSE EPRA/NAREIT Global Developed Real Estate Index Series
Monthly Statistical Bulletin July 2011, (EPRA)

Global listed REITs and property companies have grown in popularity among institutional investors in the past decade. According to the August 2010 Investor Report published by Pension Real Estate Association, institutional investors invested 32.4 percent of their public real estate allocation in global REITs in 2009, compared to 29.4 percent in 2008, representing a 10 percent year-over-year increase.¹¹ As illustrated in Figure 5, a global real estate allocation provides another source of diversification in the opportunity set, not unlike that provided by global equities and global fixed income.

Figure 5
Global Developed Real Estate Performance
Calendar Year Total Returns by Geographic Region

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Highest	North America 10.0%	Europe 21.7%	Asia 44.8%	Europe 52.7%	Asia 23.4%	Europe 67.0%	Asia 14.8%	North America -40.6%	Asia 43.4%	North America 28.6%
	Europe -6.1%	North America 2.4%	Europe 44.7%	Asia 36.8%	North America 13.2%	Asia 36.5%	North America -14.9%	Europe -51.1%	Europe 40.4%	Asia 17.2%
Lowest	Asia -17.2%	Asia -7.1%	North America 37.7%	North America 33.5%	Europe 9.4%	North America 36.3%	Europe -24.5%	Asia -52.5%	North America 32.2%	Europe 9.2%

Source: FTSE EPRA/NAREIT Global Developed Real Estate Index Series

Real Estate Investment Alternatives

Investing in listed REITs and real estate companies offers a relatively simple, inexpensive, and liquid way to diversify one’s real estate portfolio across different property sectors and geographic regions. Some investors prefer to create their own customized portfolios by investing directly in the shares of individual companies. Others prefer to invest in real estate mutual funds and exchange-traded funds (ETFs), which offer investors even simpler investment alternatives for investing in diversified portfolios of listed REITs and real estate companies.

Like investors in other equity mutual funds and ETFs, real estate investors can choose to invest in actively managed or passively managed funds. An actively managed real estate mutual fund buys and sells stocks of individual REITs and real estate companies with the objective of generating returns above a specified benchmark. A passively managed or indexed real estate mutual fund or exchange-traded fund buys and sells all (or most all) of the stocks included in a particular market index with the objective of creating a diversified portfolio of real estate companies that will closely replicate the performance of the specified index. For example, a passive real estate mutual fund which tracks the FTSE NAREIT Real Estate 50 Index would hold the 50 largest REITs of the listed REIT industry, the top ten holdings of which are shown in Figure 6. As most often is the case among equity mutual funds, actively managed real estate mutual funds have higher expense ratios on average than passively managed funds or exchange-traded funds.¹²

Figure 6

Top Ten Holdings of the FTSE NAREIT Real Estate 50 Index
(Based on free float adjusted net equity market capitalization)

Company	Property Sector	Net Market Capitalization (\$millions)
Simon Property Group	Regional Malls	33,548
Vornado Realty Trust	Diversified	17,587
Equity Residential	Apartments	17,557
Public Storage	Self Storage	14,972
Boston Property	Office	14,829
HCP	Health Care	14,695
Annaly Capital Management	Home Financing	14,146
Weyerhaeuser	Timber	12,332
Host Hotels & Resorts	Lodging/Resorts	12,105
AvalonBay Communities	Apartments	10,899

Source: NAREIT, as of April 30, 2011

Cohen & Steers created the first real estate mutual fund in 1985, and it remained the lone real estate mutual fund until 1989. As shown in Figure 7, there were 250 real estate mutual funds and separate accounts in the U.S. having combined total assets of almost \$118 billion as of March 31, 2011. Approximately 70 percent of those assets are invested in actively-managed portfolios, and the remaining 30 percent of assets are invested in passively-managed portfolios or index funds.

Figure 7
Real Estate Mutual Funds and Separate Accounts

	# of Funds	AUM (billions)
Active		
U.S. Mutual Funds	65	\$34.4
Global Mutual Funds	46	\$19.3
U.S. Separate Accounts	43	\$16.1
Global Separate Accounts	55	\$11.5
Total	209	\$81.3
Passive		
U.S. Mutual Funds	20	\$30.3
Global Mutual Funds	14	\$4.7
U.S. Separate Accounts	5	\$0.7
Global Separate Accounts	2	\$0.9
Total	41	\$36.6

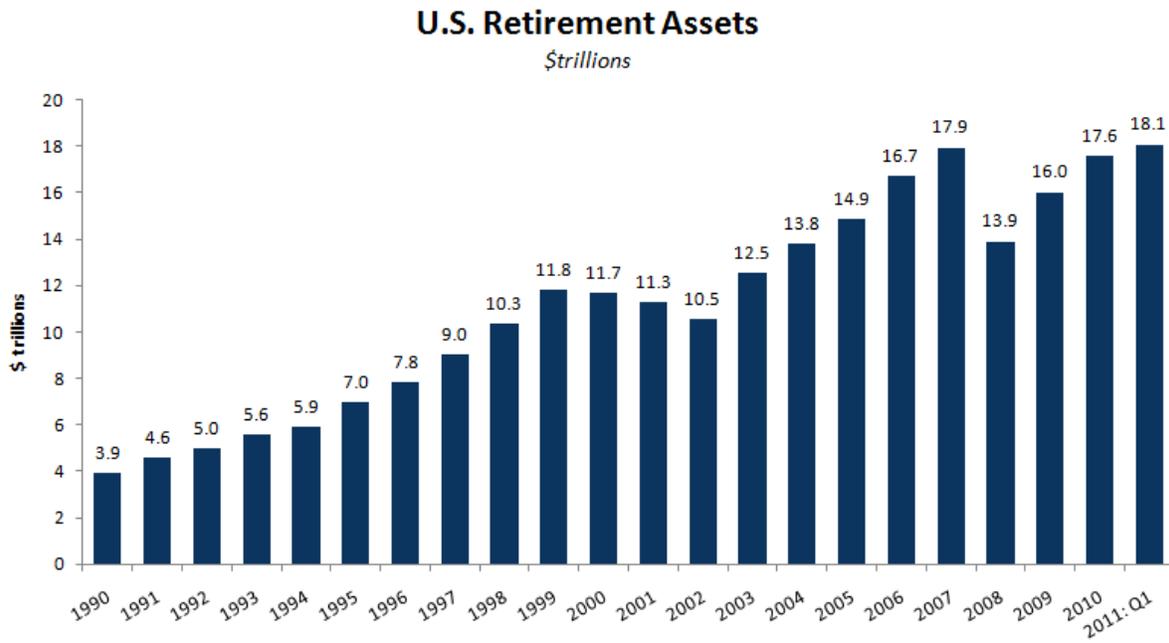
Source: Wilshire CompassSM, as of March 31, 2011

RETIREMENT LANDSCAPE AND INVESTMENT RISKS

The U.S. retirement market is estimated to hold \$18.1 trillion in assets, or 37 percent of all household financial assets.¹³ As shown in Figure 8, the financial crisis of 2008-2009 took retirement assets on a tumultuous ride, bringing assets from a high of \$17.9 trillion in 2007 to a low of \$13.9 trillion in 2008, representing a 22 percent decline over the span of just one year. Since then, retirement assets have slowly been inching back towards pre-crisis levels and have now recovered losses of that period.

As the retirement market recovers, it also faces a challenging landscape. The changing demographic profile of the population, illustrated most clearly by the aging of the “baby boomer” generation will dramatically increase the number of retirees in coming years. In the U.S., for example, the share of the population age 60 and over is projected to increase from 18 percent in 2009 to 27 percent in 2050.¹⁴

Figure 8



Source: Investment Company Institute (2011). The U.S. Retirement Market, First Quarter 2011

This impending demographic shift has grabbed the attention of policymakers, regulators, and investment professionals alike, particularly in light of recent economic and financial events. A key concern is whether baby boomers will be able to financially support themselves during their retirement, with recent surveys revealing that many Americans are largely underprepared for retirement. According to the *2010 Retirement Fitness Survey* by Wells Fargo, the median retirement savings of respondents age 50 to 59 is \$29,000, indicating that 50 percent of those closest to retirement have saved \$29,000 or less.¹⁵ Other sources report similar findings. The Employee Benefit Research Institute (EBRI) 2010 Retirement Readiness Rating™ reports that 47 percent of boomers between 56 and 62 years of age “are simulated to be at risk of not having sufficient retirement income to pay for ‘basic’ retirement expenditures as well as uninsured health care costs.”¹⁶ Of those between 46 and 55, 44 percent are at risk of having an insufficiently funded retirement.¹⁷ Baby boomers are not the only cohort at risk of outliving their retirement savings. Forty-five percent of Americans between the ages of 36 and 45 also are at risk of being unable to maintain their standard of living throughout retirement.¹⁸

Market Risk

At the root of the problem for most individuals nearing retirement is a record of undersaving paired with investment decisions that fail to address key retirement risks. For example, the recent financial crisis highlighted the importance of *market risk*. Many investors developed a false sense of security with respect to equity markets owing to consistently rising equity prices during the bull market years leading up to 2007. This sense of security was reinforced by financial advice that highlighted the appearance of reliable average investment returns over holding periods of only a few years, but underestimated the frequency and severity of intermittent financial crises. At the end of 2007, 43 percent of 401(k) participants age 56 to 65 had more than 70 percent of their account balances invested in equities.¹⁹ When asset values dropped sharply, investors with such poorly diversified portfolios suffered losses that may never be recovered, particularly for investors close to, or at, retirement age. Market risk is just one of a few critical risks investors face. Other key risk factors include horizon risk, longevity risk, inflation risk, and liquidity risk.

Horizon Risk

Time is an inherent diversifier for risk. A lengthy investment horizon prior to retirement makes it possible for investors to recover from unrealized losses or periods of underperformance, although recovery is not guaranteed. However, as investors approach their retirement years, the investment period remaining before retirement – the investment time horizon – becomes shorter. *Horizon risk* refers to the risk of not being able to recover from losses because of inadequate time for investors to increase their savings rate and benefit from rising markets before they need to begin liquidating their investments to provide retirement income.

Since the market downturn of 2008-2009, many investors at or near retirement age have found themselves with insufficient time for the assets remaining in their retirement portfolios to recover their losses and to meet their retirement goals. Therefore, investors with a shorter investment horizon should invest in less risky portfolios, all else equal, than should investors with a longer investment horizon. This is one of the cornerstone concepts for the design of most *Target Date Funds*. As investors approach retirement age, the portfolio gradually holds a higher proportion of lower risk assets, such as fixed income assets and inflation protected assets, to account for horizon risk.

Longevity Risk

Related to horizon risk within the realm of investing is *longevity risk*, which most certainly deserves more attention than it has received. Simply put, longevity risk refers to the risk of outliving one's portfolio; that is, living beyond the time when assets have been totally depleted. With medical advancements and improving living conditions, average life expectancies have been improving globally, leading to longer retirements. In 2007, the average 65 year old American was expected to live 19 years, compared to 15 years in 1970.²⁰ As life expectancy

increases, one's retirement portfolio may be required to support retirement periods of 20 years, 25 years, 30 years, or even longer.

Inflation Risk

Yet another key risk often overlooked when building and managing a retirement portfolio is *inflation risk*, or the risk that the future purchasing power of one's assets will erode over time due to rising prices, thereby imposing a lower standard of living on retirees. Inflation has a less direct impact on those of working age than those already retired because compensation and benefit levels often are adjusted during one's working lifetime to at least partially offset the impact of rising prices. However, those who already are retired or nearing retirement have more limited opportunities to effectively protect themselves against the effects of inflation on the future purchasing power of their financial assets.

Owing to the financial crisis, inflation in recent years has been extraordinarily low. For the three-year period 2008-2010, inflation was only 1.4 percent at an annual rate. For the much longer historical period of 1976-2010, however, annualized inflation was nearly three times as high at 4.0 percent. Moreover, investors should not overlook the nine-year period of 1973-1981, when inflation was more than double the long-run average and remained stubbornly high at an annualized rate of 9.2 percent, only brought under control, in part, by a period of record high interest rates and a severe economic recession.

Though inflation has been tempered in recent years, the Federal Reserve's efforts to stimulate the economy through a policy of low interest rates and two rounds of quantitative easing have pumped massive amounts of liquidity into the economy and stoked concerns among investors with respect to the risk of appreciably higher inflation in coming years.

Liquidity Risk

Last but not least, *liquidity risk* is another key risk faced by investors in or near retirement. For these investors, having consistent and immediate access to the cash value of at least part of their investment portfolio is critically important because their need for a steady and reliable income stream available for unexpected expenses often supersedes their need for capital appreciation of their assets. Therefore, assets that trade regularly in public markets typically provide the most immediate access to liquidity, whereas assets without such a trading platform have restricted, if any, liquidity and a limited, if any, role in a retiree's portfolio.

PORTFOLIO CONSTRUCTION

In order to address these retirement risks in a comprehensive manner, a more holistic approach to portfolio construction and risk management is necessary. First and foremost is to identify all of the primary asset classes and subclasses included in the *opportunity set* available to investors when building and managing their retirement savings portfolios. Among these are equities, bonds, real estate, commodities and cash. When constructing their retirement portfolio, investors need to decide how much of their savings should be allocated to each of the

investment choices available to them in their opportunity set. For example, how much should be invested in stocks, and how much should be invested in bonds? Within the bond allocation, how much should be invested in government bonds and how much in corporate bonds? Within the equity allocation, how much should be invested in domestic equities, and how much in international equities?

In addition, how much should be invested in real estate? Among other attributes, real estate investment through listed REITs and property companies provides stable and reliable income, the potential for portfolio diversification, and a partial inflation hedge. Access to real estate investment for individuals is available through listed REITs, non-listed REITs and, for some, private REITs. For many individual investors, however, the most practical way to invest in real estate is through listed REITs because most tax-advantaged savings accounts, such as individual retirement accounts, defined contribution retirement plans, and other post-employment benefit trusts require significant, if not daily, liquidity and market pricing.

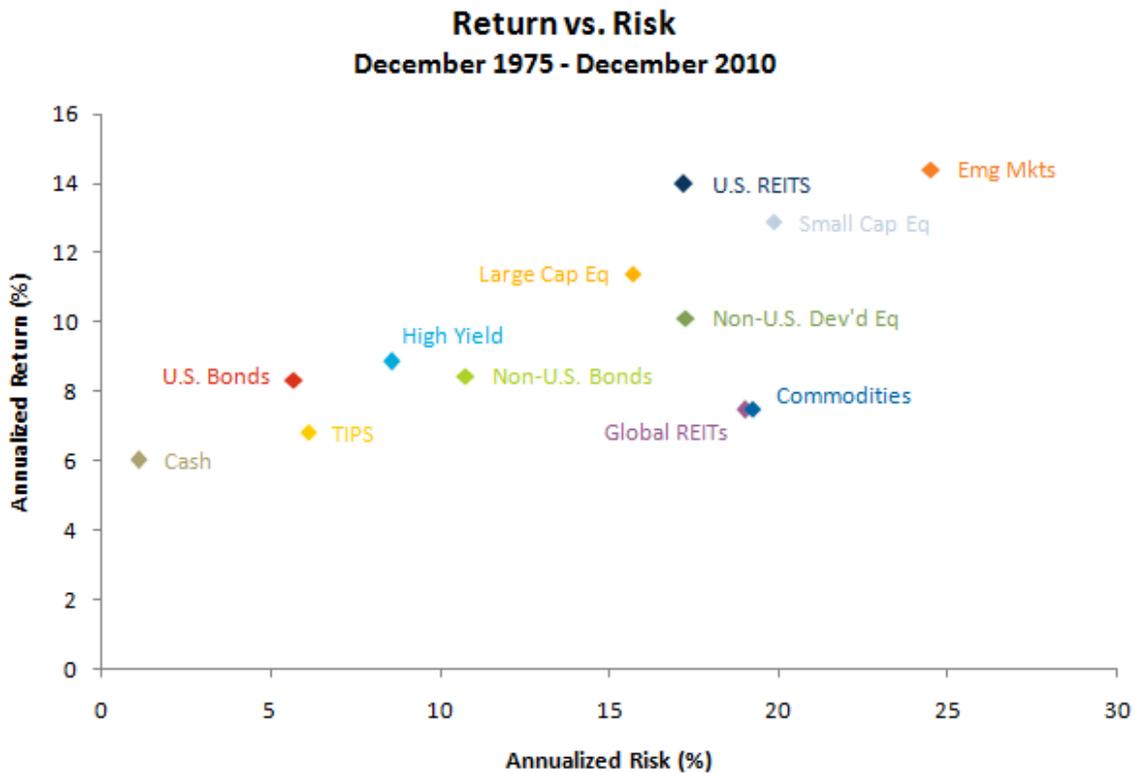
For our purposes, we include listed REITs and property companies in the opportunity set because transparent, public market indexes are readily available for benchmarking performance and because all other asset classes in our opportunity set are available in publicly traded markets, which provides uniformity of access, efficient pricing, and low transactions costs. Figure 9 summarizes the investment benchmarks of the 12 asset classes included in the opportunity set.

Figure 9
Opportunity Set of Asset Classes and Benchmarks Used in Portfolio Construction

Asset Class	Index
Cash	Merrill Lynch 91 Day T-Bill Index
TIPS	Barclays Capital U.S. TIPS Index
U.S. Bonds	Barclays Capital U.S. Aggregate Index
High Yield	Merrill Lynch High Yield Master II Index
Non-U.S. Bonds	Citigroup Global Markets Non U.S. Govt Bond Index
Large Cap Equities	Wilshire U.S. Large-Cap Index SM
Small Cap Equities	Wilshire U.S. Small-Cap Index SM
U.S. REITs	FTSE NAREIT All Equity REITs Index
Global REITs	FTSE EPRA/NAREIT Global Developed Index
Non-U.S. Dev'd Equities	MSCI EAFE Index
Emg Mkts	MSCI Emerging Markets Index
Commodities	S&P GSCI Total Index

The historical 35-year investment performance record of the 12 asset classes included in the opportunity set is summarized in Figure 10. Appendix 1 provides a detailed performance record for all assets in the opportunity set.

Figure 10
Performance Record of the Opportunity Set: 1975-2010



Source: Wilshire Compass²¹

REIT Investment for Income plus Capital Appreciation

One of the most desirable attributes of listed REIT investment performance is the dividend income included in the total return. Because REITs in the U.S. are required by the Internal Revenue Code to distribute annually to their shareholders at least 90 percent of their taxable income as dividends, REIT shareholders historically have received relatively high and steady income streams from their REIT investments. Equity investors typically consider cash dividends an important component of the total return from a stock investment. However, many companies in the early 1990s started to appreciably reduce their dividend payouts. As shown in Figure 11, for example, the income return (total return less price return) of the S&P 500 Index declined 76

percent from 4.1 percentage points in 1991 to a low of only 1.0 percentage point in 2000. Over the last two decades, many companies in the S&P 500 Index have chosen to retain and reinvest most of their free cash flow, reducing their dividends in pursuit of higher earnings per share growth and distinguishing themselves from more value oriented companies. Even large value stocks, as represented by the Wilshire U.S. Large-Cap Value IndexSM, saw a 59 percent reduction in the income return from 5.1 percentage points in 1991 to 2.1 percentage points in 2000.

Figure 11
Two Decades of Investment Performance

Year Ending December 31,	Annual Returns								
	FTSE NAREIT All Equity REITs Index			S&P 500 Index			Wilshire U.S. Large-Cap Value Index		
	Total Return	Price Return	Income Return	Total Return	Price Return	Income Return	Total Return	Price Return	Income Return
1991	35.7%	25.5%	10.2%	30.4%	26.3%	4.1%	24.5%	19.5%	5.1%
1992	14.6%	6.4%	8.2%	7.6%	4.5%	3.1%	11.2%	6.6%	4.6%
1993	19.7%	13.0%	6.7%	10.1%	7.1%	3.0%	15.6%	11.4%	4.2%
1994	3.2%	-3.5%	6.7%	1.3%	-1.5%	2.9%	-2.0%	-7.0%	5.0%
1995	15.3%	6.6%	8.7%	37.5%	34.1%	3.4%	35.3%	29.0%	6.4%
1996	35.3%	26.3%	8.9%	22.9%	20.3%	2.7%	20.7%	16.1%	4.6%
1997	20.3%	13.3%	6.9%	33.3%	31.0%	2.3%	32.1%	28.3%	3.8%
1998	-17.5%	-22.3%	4.8%	28.6%	26.7%	1.9%	17.9%	15.2%	2.8%
1999	-4.6%	-12.2%	7.6%	21.0%	19.5%	1.5%	4.8%	2.8%	2.1%
2000	26.4%	16.5%	9.9%	-9.1%	-10.1%	1.0%	6.9%	4.8%	2.1%
2001	13.9%	5.8%	8.1%	-11.9%	-13.0%	1.2%	-5.4%	-7.3%	1.9%
2002	3.8%	-3.1%	6.9%	-22.1%	-23.4%	1.3%	-14.7%	-16.7%	2.0%
2003	37.1%	28.5%	8.7%	28.7%	26.4%	2.3%	30.6%	27.2%	3.3%
2004	31.6%	24.4%	7.2%	10.9%	9.0%	1.9%	13.6%	10.8%	2.7%
2005	12.2%	6.7%	5.5%	4.9%	3.0%	1.9%	5.7%	3.0%	2.7%
2006	35.1%	29.5%	5.6%	15.8%	13.7%	2.2%	21.9%	18.7%	3.2%
2007	-15.7%	-19.1%	3.4%	5.5%	3.6%	1.9%	1.9%	-0.9%	2.8%
2008	-37.7%	-41.1%	3.4%	-37.0%	-38.5%	1.5%	-36.6%	-38.8%	2.2%
2009	28.0%	21.3%	6.7%	26.5%	23.5%	3.0%	17.0%	9.8%	7.1%
2010	27.9%	23.1%	4.9%	15.1%	12.8%	2.3%	16.6%	15.7%	0.8%
1991 - 2010*	12.2%	5.4%	6.8%	9.1%	6.9%	2.2%	9.4%	6.0%	3.4%

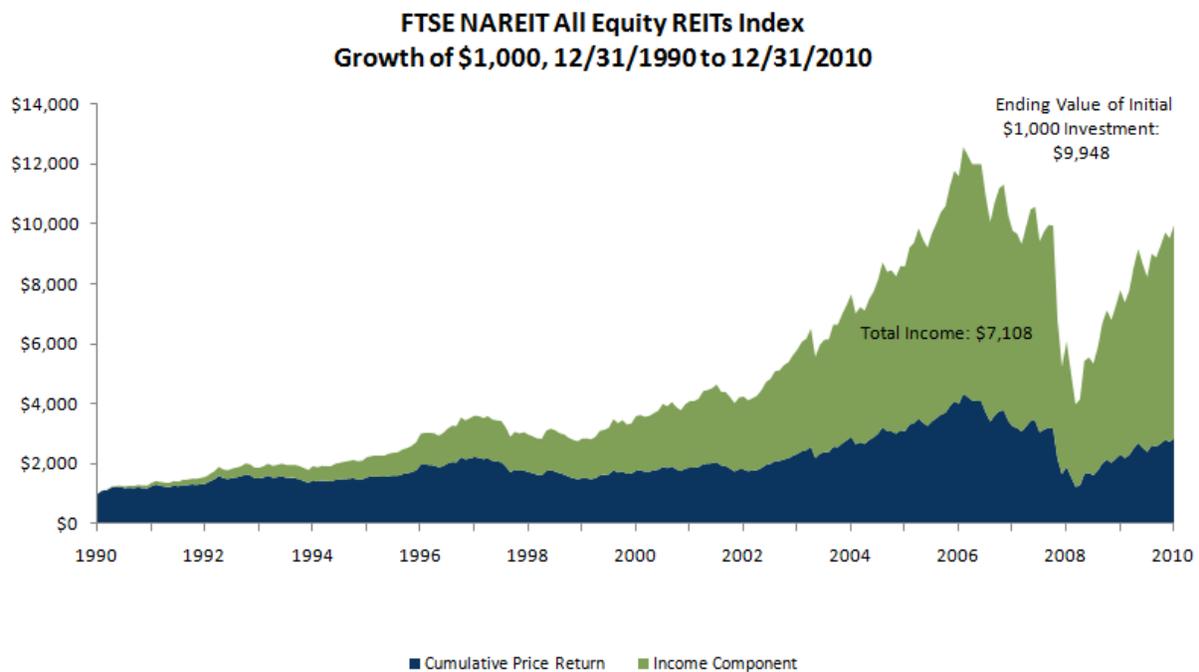
* Annualized Return

Source: Wilshire Compass²²

REIT stocks, on the other hand, maintained relatively high and steady dividend payouts. The income return for REITs declined only slightly from 10.2 percentage points of the total return in 1991 to 9.9 percentage points in 2000. Even in the comparably low yield environment of recent years, REITs have provided a meaningful level of income. Although 2010 income returns fell across the board for all indexes when compared with 2009, Equity REITs still maintained a relatively high income return of 4.9 percentage points, compared with 2.3 percentage points for large cap equities and 0.8 percentage points for large cap value equities. On balance, the annualized income return for the FTSE NAREIT All Equity REITs Index over the 20-year period from 1991 to 2010 was 6.8 percentage points or 56 percent of the total return, compared with only 2.2 percentage points (24 percent) for the S&P 500 Index and 3.4 percentage points (36 percent) for the Wilshire U.S. Large-Cap Value Index.

The cumulative impact over time of REITs' high dividend yields can be substantial. As shown in Figure 12, a hypothetical \$1,000 investment in the FTSE NAREIT All Equity REITs Index from December 31, 1990 to December 31, 2010 would have resulted in a final portfolio value of \$9,948, of which \$2,840 would have come from capital appreciation and \$7,108 (or 71 percent) owed to reinvested dividends.

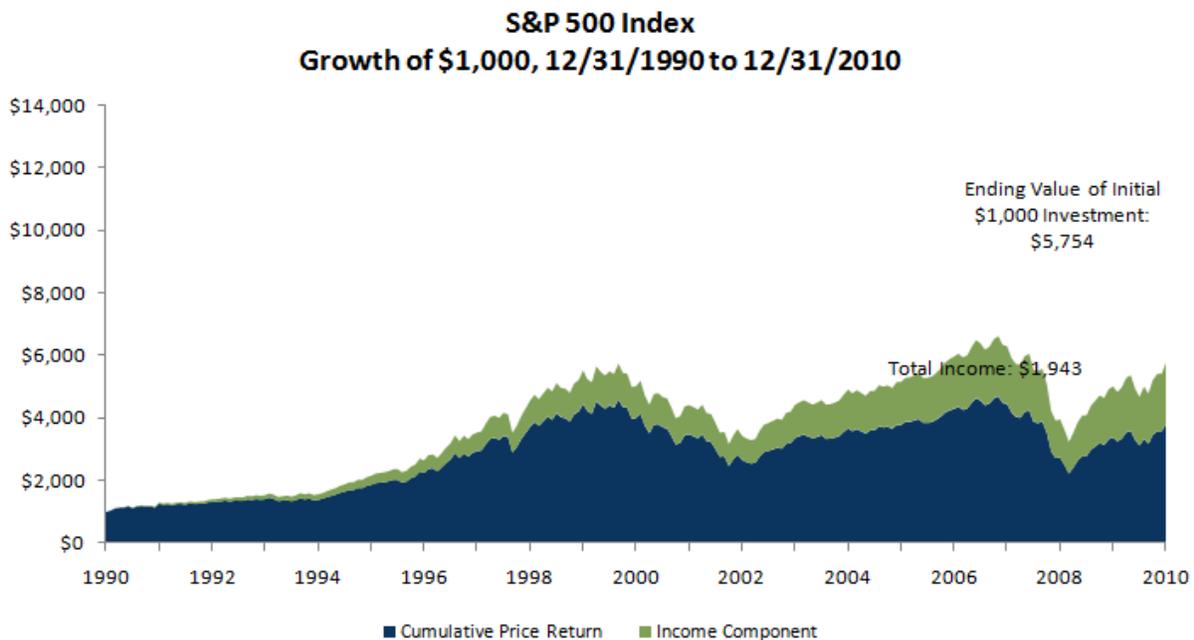
Figure 12



Source: NAREIT

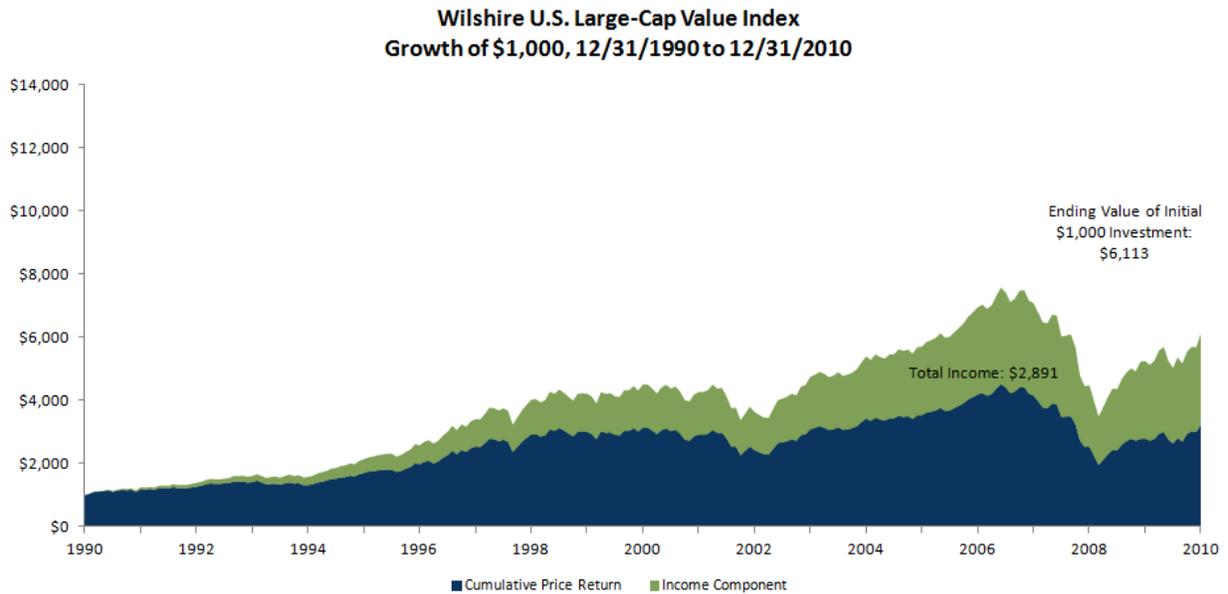
As illustrated in Figure 13, the same \$1,000 investment in the S&P 500 Index would have resulted in a final portfolio value of \$5,754, of which \$3,811 would have come from price appreciation and \$1,943 (or 34 percent) owed to reinvested dividends, whereas the same investment in the Wilshire U.S. Large-Cap Value Index would have grown to a final portfolio value of \$6,113, of which \$3,222 would have come from price gains and \$2,891 (or 47 percent) owed to reinvested dividends (Figure 14).

Figure 13



Source: Wilshire Compass

Figure 14



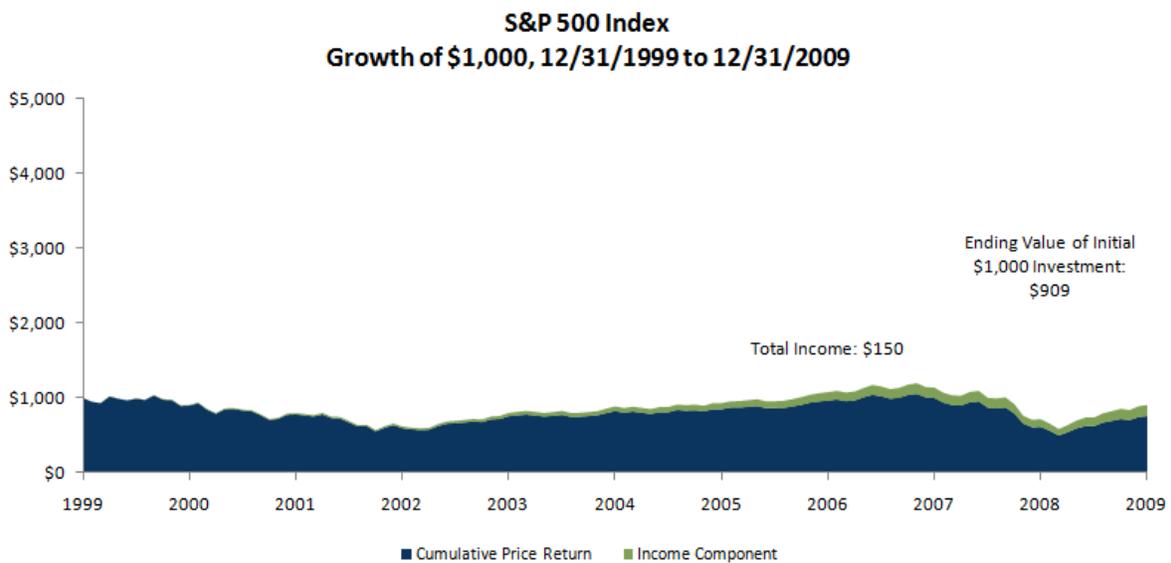
Source: Wilshire Compass²³

Figures 12, 13 and 14 also illustrate the cumulative impact of reinvested and compounded dividends on long-term investment performance. Although cumulative price returns over the past 20 years were appreciably higher for the S&P 500 Index and the Wilshire U.S. Large-Cap Value Index, the generous dividend distributions of REITs (when reinvested) provided investors with total returns that far exceeded those of large cap equities as well as those of large cap value equities.

Importantly, high dividend income helps to cushion the losses incurred during periods of negative price returns. During the financial crisis, for example, REIT share prices declined 71 percent from the end of January 2007 to the end of February 2009, but the \$1,000 investment in REITs made on December 31, 1990 still was worth \$3,977 after the price decline. By comparison, share prices for companies in the S&P 500 Index declined only 53 percent from the end of October 2007 to the end of February 2009, but the \$1,000 investment in the S&P 500 made on December 31, 1990 stood at only \$3,236 after the fall in prices. Similarly for large value companies, equity share prices of companies in the Wilshire U.S. Large-Cap Value Index dropped 56 percent from the end of October 2007 to the end of February 2009, but the \$1,000 initial investment stood at \$3,476 at the end of February 2009. Because income returns play a smaller role in the total return of other equities, investors in those asset classes were more affected by the negative price returns of those years than were investors in REITs.

The financial crisis of 2008-2009 marked the culmination of a period commonly referred to as the *Lost Decade*. During the 2000s, many investors did not see any gains in their equity portfolios because of the two bear markets during this period. As shown in Figure 15, a \$1,000 investment in large cap equities on December 31, 1999 was worth only \$909 by year-end 2009, resulting in a negative total return over the 10-year investment period.

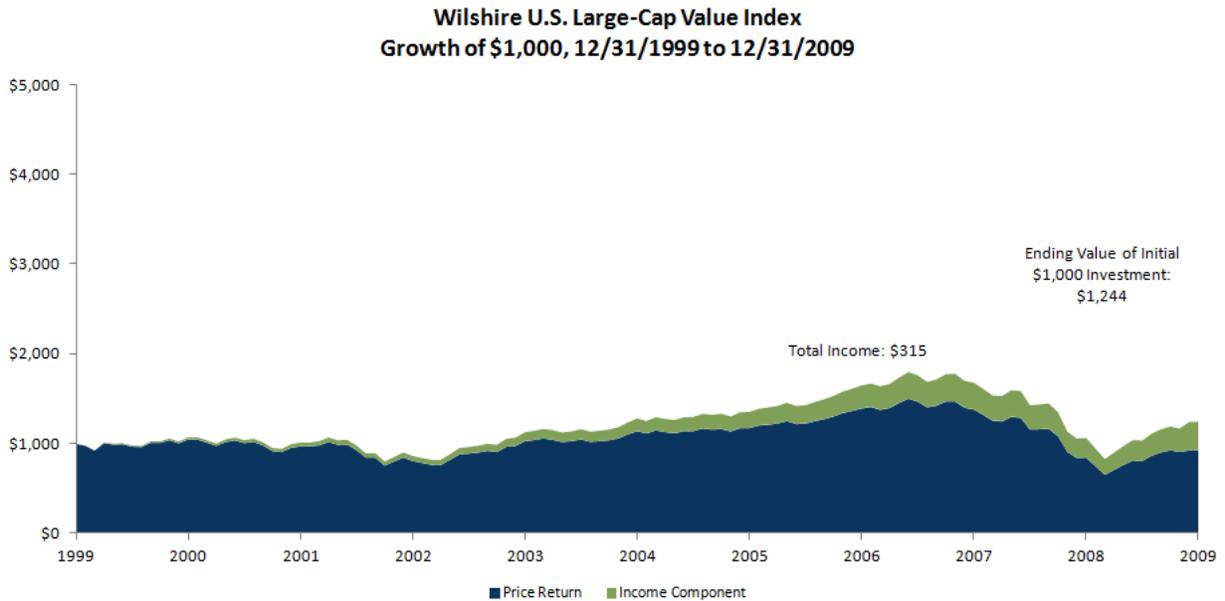
Figure 15
Performance of Large Cap Equities over the *Lost Decade*



Source: Wilshire Compass

Had the portfolio been invested in large cap value stocks, as shown in Figure 16, it would have had higher returns resulting in a portfolio value of \$1,244.

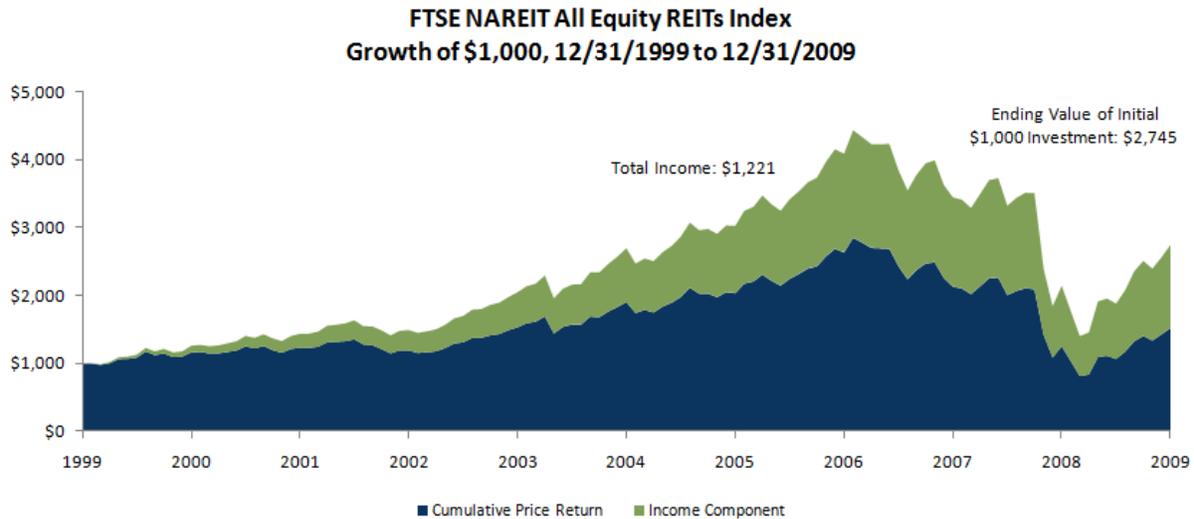
Figure 16
Performance of Large Cap Value Equities over the *Lost Decade*



Source: Wilshire Compass

However, if the \$1,000 portfolio had been invested in equity REITs, as illustrated in Figure 17, it would have generated a far higher total return than both large cap equities and large cap value equities, producing a portfolio with an ending value of \$2,745 at the end of the 10-year investment horizon. During a period when many investors failed to capture significant growth in their equity portfolios, it is noteworthy that REITs provided generous total returns, largely fueled by high income returns.

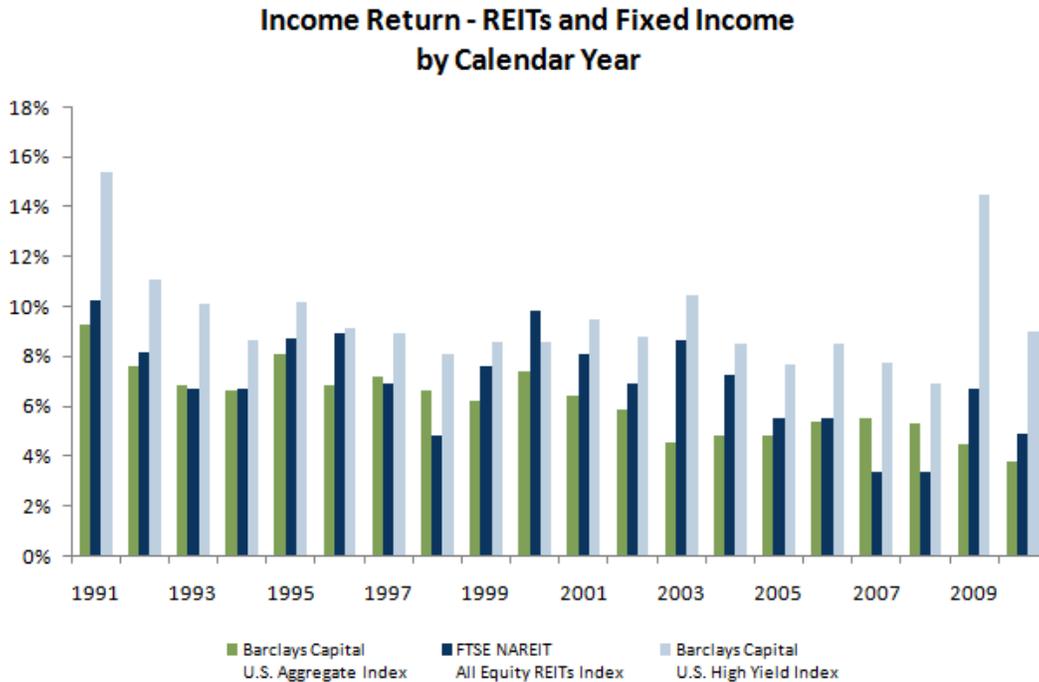
Figure 17
Performance of Equity REITs over the *Lost Decade*



Source: Wilshire Compass

Because of their relatively high and stable dividends, REIT stocks often are viewed as having investment attributes of both stocks (capital appreciation) and bonds (income). Although REIT stocks share many of the characteristics of other equities, their high and stable dividends provide income returns that also are comparable to those of fixed income securities. High yield bonds, for example, provide a particularly relevant comparison with REIT stocks because of their high income returns but other equity-like characteristics. As revealed in Figure 18, the income returns of the FTSE NAREIT All Equity REITs Index have fallen between those of the Barclays Capital U.S. Aggregate Index and the Barclays Capital U.S. Corporate High Yield Index in 15 years of the 20-year period 1991-2010. Over the entire period, the average annual income return for REITs was 6.8 percentage points, somewhat more than the 6.4 percentage points for U.S. investment grade bonds but below the 9.3 percentage points for U.S. corporate high yield bonds. Thus, REITs can serve as a diversifier option within a fixed income portfolio, providing investors an additional source of potential capital appreciation without significantly altering the desired level of portfolio income.

Figure 18



Annualized Income Return: 1991 - 2010	
Barclays Capital U.S. Aggregate Index	6.4%
FTSE NAREIT All Equity REITs Index	6.8%
Barclays Capital U.S. HY Index	9.3%

Source: Wilshire Compass, Barclays Capital Live

REIT Investment for Diversification

A second notable benefit of REIT investment is portfolio risk diversification. The correlation of returns among different asset classes is central to diversifying an investment portfolio and managing risk. Correlation measures how closely the investment returns from two assets move together, with a correlation of +1.0 denoting perfectly synchronized movements in the same direction and a correlation of -1.0 denoting perfectly synchronized movements in the opposite direction. Perfectly positively correlated assets do not provide any portfolio risk diversification because the volatility of a portfolio of perfectly correlated assets is equal to the weighted sum of the individual asset volatilities.²⁴ In other words, the expected risk of holding perfectly correlated assets together in a portfolio is equal to the expected risk of holding the assets individually. Correlations less than 1.0 signify that asset returns do not move perfectly together, and the



portfolio volatility of uncorrelated assets is less than the weighted sum of the individual asset volatilities. The lower the correlations among asset class returns, the less synchronized are the returns and the greater the risk diversification benefits.

The correlation of returns from any investment opportunity with the returns of other assets in the opportunity set need not be negative or even inordinately low to increase portfolio diversification and efficiency. Even moderate correlation is sufficient to provide meaningful portfolio diversification benefits. When the return of one asset class is high enough, the volatility is low enough, and/or the pattern of its returns is sufficiently uncorrelated with those of other investment classes, then that investment can earn a place in the efficient portfolio.

Historically, REIT returns have been relatively uncorrelated with the returns of other major asset classes. As shown in Figure 19 for the period 1976-2010, for example, the correlation of returns from the FTSE NAREIT All Equity REITs Index with the returns from other major asset classes ranged from 0.17 with returns from the Barclays Capital U.S. Aggregate Index to 0.66 with returns from the Wilshire U.S. Small-Cap Index.

Figure 19

Asset Class Return Correlations, 12/31/1975 – 12/31/2010²⁵

	Barclays Capital U.S. Aggregate Index	Merrill Lynch High Yield Master II Index	Wilshire U.S. Large Cap Index	Wilshire U.S. Small Cap Index	FTSE NAREIT All Equity REITs Index	MSCI EAFE Index	MSCI Emerging Markets Index
Barclays Capital U.S. Aggregate Index	1.00	0.25	0.23	0.16	0.17	0.16	-0.01
Merrill Lynch High Yield Master II Index	0.25	1.00	0.57	0.63	0.58	0.50	0.68
Wilshire U.S. Large Cap Index	0.23	0.57	1.00	0.88	0.57	0.63	0.81
Wilshire U.S. Small Cap Index	0.16	0.63	0.88	1.00	0.66	0.58	0.79
FTSE NAREIT All Equity REITs Index	0.17	0.58	0.57	0.66	1.00	0.45	0.51
MSCI EAFE Index	0.16	0.50	0.63	0.58	0.45	1.00	0.87
MSCI Emerging Markets Index	-0.01	0.68	0.81	0.79	0.51	0.87	1.00

Source: Wilshire Compass

Among the major asset classes often included in a global diversified portfolio, REIT returns typically are most highly correlated with returns from small cap stocks. But even with a correlation coefficient of 0.66, there remain meaningful risk reduction benefits when REITs are included in the asset allocation. Of the asset class correlations shown in Figure 19 above, the highest correlation was between U.S. large cap stocks and U.S. small cap stocks, which had a correlation coefficient of 0.88. However, rarely are small cap stocks excluded from an asset allocation simply because of their elevated correlation with large cap stocks. Clearly, correlation is an important factor to consider when creating a diversified portfolio, but its importance should

not be exaggerated when determining the suitability of any asset class. As long as there are meaningful variations in the return and risk expectations for various asset classes, one should always consider expanding the opportunity set to develop more robust asset allocations to enhance diversification and reduce overall portfolio risk.

The importance of portfolio diversification was accentuated during the financial crisis of 2008-2009. During the height of the crisis from September 2008 through March 2009, correlations broadly increased across most asset classes, particularly for the major equity sub-asset classes. As shown in Figure 20, the correlation of returns between U.S. large cap stocks and U.S. small cap stocks spiked to 0.98, while the correlation of returns between international developed markets and emerging markets rose to 0.97. While the correlation of returns between REITs and other asset classes also increased during this period, the magnitude of the change was not nearly as dramatic as those across other equity sub-asset classes.

Figure 20
Asset Class Return Correlations, 8/31/2008 – 3/31/2009²⁶

	Barclays Capital U.S. Aggregate Index	Merrill Lynch High Yield Master II Index	Wilshire U.S. Large Cap Index	Wilshire U.S. Small Cap Index	FTSE NAREIT All Equity REITs Index	MSCI EAFE Index	MSCI Emerging Markets Index
Barclays Capital U.S. Aggregate Index	1.00	0.50	0.65	0.63	0.51	0.83	0.71
Merrill Lynch High Yield Master II Index	0.50	1.00	0.74	0.80	0.68	0.77	0.84
Wilshire U.S. Large Cap Index	0.65	0.74	1.00	0.98	0.79	0.95	0.95
Wilshire U.S. Small Cap Index	0.63	0.80	0.98	1.00	0.87	0.94	0.94
FTSE NAREIT All Equity REITs Index	0.51	0.68	0.79	0.87	1.00	0.75	0.70
MSCI EAFE Index	0.83	0.77	0.95	0.94	0.75	1.00	0.97
MSCI Emerging Markets Index	0.71	0.84	0.95	0.94	0.70	0.97	1.00

Source: Wilshire Compass

Similar to the diversification benefits captured by expanding a portfolio to include investment in non-U.S. stocks as well as U.S. stocks, a portfolio can be diversified further by investing in commercial real estate through listed REITs and property companies both domestically and globally. The FTSE EPRA/NAREIT Developed Real Estate Index includes three broad regional markets: North America, Developed Europe, and Developed Asia. Constituents of the index include both real estate companies that operate as REITs (according to the rules of their respective countries) and those that do not. Although commercial real estate investments across the three regions share many attributes, differences in economic cycles, fiscal and monetary policies, real estate market fundamentals, and local regulatory requirements lead to real estate investment returns in each of the three regions that are less correlated than might be expected. As revealed in Figure 21 for the 20-year period from 1991 to 2010, the correlation of

returns was the lowest at 0.43 between North America and Developed Asia and the highest at 0.64 between North America and Developed Europe.

Figure 21

Asset Class Return Correlations, 12/31/1990 – 12/31/2010²⁷

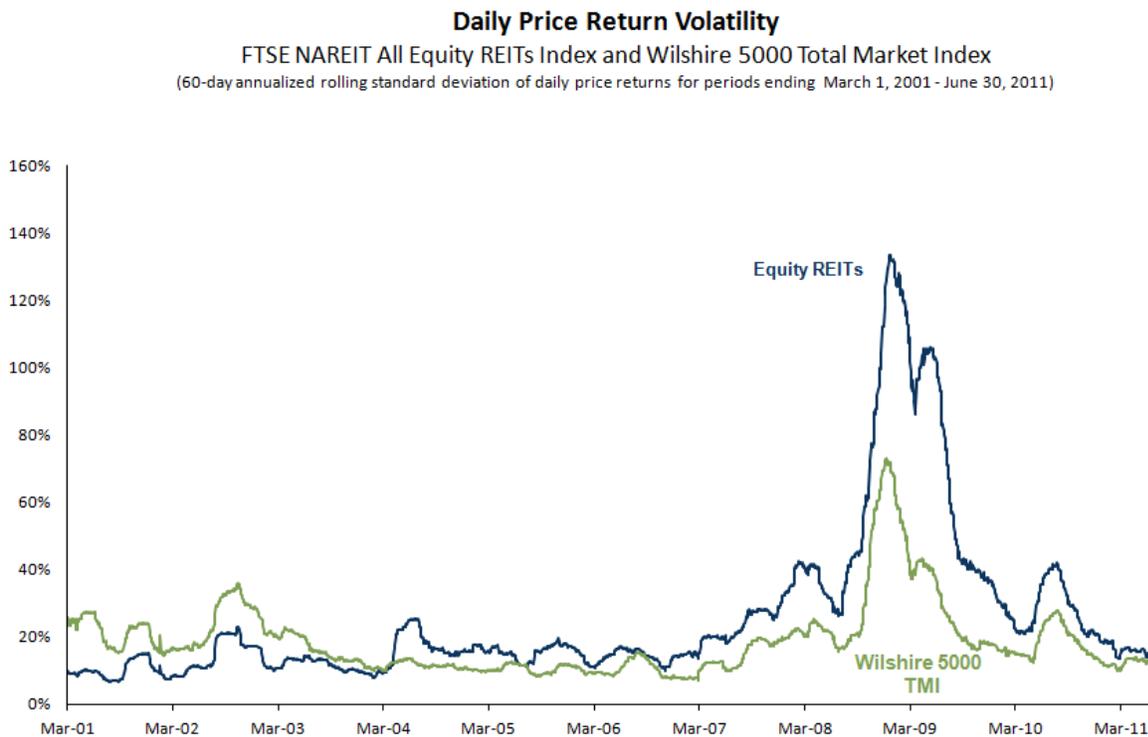
	FTSE EPRA/NAREIT North America Index	FTSE EPRA/NAREIT Developed Asia Index	FTSE EPRA/NAREIT Developed Europe Index
FTSE EPRA/NAREIT North America Index	1.00	0.43	0.64
FTSE EPRA/NAREIT Developed Asia Index	0.43	1.00	0.52
FTSE EPRA/NAREIT Developed Europe Index	0.64	0.52	1.00

Source: FTSE EPRA/NAREIT Developed Real Estate Index Series

Volatility

The volatility of asset class returns is another important investment characteristic affecting optimal asset allocations. As shown above in Figure 10, the long-term volatility of U.S. REITs has been comparable with that of U.S. large cap and small cap equities, although the volatility of emerging markets equities has been much higher. Not surprisingly, just as correlations increased broadly across most asset classes during the height of the great financial crisis from September 2008 through March 2009, the volatility of U.S. REITs and other U.S. equities also jumped. As revealed in Figure 22, however, the spike in volatility for both REITs and other equities has long since subsided to levels that prevailed before the crisis.

Figure 22



Source: NAREIT, Wilshire Indexes

Inflation Protection

Commercial real estate investment through REITs can also provide a meaningful hedge against inflation. Apart from investing in Treasury Inflation Protected Securities (TIPS), investors often assume that investing in commodities is one of the most efficient hedges against inflation. As shown in Figure 23, however, data from 1976 through 2010 suggest that investing in REITs would have provided far superior inflation protection than investing in commodities. Comparing inflation rates over rolling six-month and rolling 12-month time periods, returns on REIT investment outpaced the periodic inflation rate 75 percent of the time, whereas returns on commodities outpaced periodic inflation only about 60 percent of the time.

Figure 23

Percent of Rolling Periods in which Total Return Met or Exceeded Inflation
(Monthly returns, 12/31/1975 – 12/31/2010²⁸)

	S&P GSCI Total Index	S&P 500 Index	FTSE NAREIT All Equity REITs Index	Barclays Capital U.S. Aggregate Index	Barclays Capital U.S. TIPS Index
6 month rolling returns	59%	66%	74%	67%	75%
12 month rolling returns	60%	72%	75%	76%	81%

Source: Wilshire Compass; U.S. Department of Labor, Bureau of Labor Statistics

REIT INVESTMENT IN TARGET DATE FUNDS

Prior to 1993, the relatively small market capitalization of REITs in combination with the “five-or-fewer” rule discouraged many of the largest pension funds from investing in REITs. The “five-or-fewer” provision of the 1960 REIT Act limited the largest five shareholders of a REIT to combined holdings of no more than 50 percent of all shares outstanding. Although investing on behalf of many beneficiaries, a pension fund was counted as one shareholder. Thus, the “five-or-fewer” rule limited REIT investment among traditional defined benefit plans. The application of this rule was changed with the passage of the Omnibus Budget Reconciliation Act of 1993, which allowed REITs to count all the beneficiaries of a pension fund as individual shareholders rather than as one collective investor. Subsequently, pension fund investment in REITs is estimated by some to have grown to nearly 30 percent of the REIT market by 1998 compared with only 12 percent in 1993.²⁹ In addition to pension funds, REITs also have become a more popular form of real estate investment among other institutional investors. Total institutional ownership of REITs is estimated to have grown from 16 percent in 1992 to 41 percent in 1996.³⁰ At the end of 2009, more than 80 percent of REIT shares were reported to have been held by institutional investors, including mutual funds, exchange traded funds and company insiders.³¹



Investment in REITs in the retail marketplace has grown as well. In addition to purchasing shares of individual companies, retail investors can access REIT investment through investment products such as open-end and closed-end real estate mutual funds as well as exchange-traded funds. Another recent investment product is the *Target Date Fund* (TDF), an increasingly popular option among investors using tax-advantaged savings accounts, such as individual retirement accounts and 401(k) savings plans. Seeking to replicate, in part, the professional investment policies and practices of traditional defined benefit plans, TDFs are relatively new investment products designed to provide individual investors with a professionally managed and well-diversified portfolio suitable to provide future retirement income. TDFs were developed to simplify the key factors that typically drive investment decisions, such as asset selection, portfolio diversification, risk management and rebalancing over time.

The prominence of TDFs has grown since the passage of the Pension Protection Act of 2006 (PPA). Under PPA, the Department of Labor (DOL) determined that TDFs meet the standards of a Qualified Default Investment Alternative (QDIA) available for 401(k) plans. According to a Towers Watson Survey conducted in 2009, 72 percent of 401(k) plan sponsors elected TDFs as their plan's QDIA compared with 62 percent in 2008.³²

Notably, REITs play a prominent role within TDFs. In recent years, there has been a significant increase in the number of TDFs that include a REIT allocation as well as the proportion of total assets allocated to REITs within these products. This is borne out by research in the defined contribution market, whether such research has been conducted with product developers, investment consultants or plan sponsors. With respect to product developers, a 2009 survey conducted by Callan Associates revealed that 73 percent of 33 distinct target date fund series included a real estate allocation.³³ In a vast majority of cases, the real estate allocation within these funds was exclusively a REIT allocation. In addition, many major target date product providers have significant real estate allocations within their target date products (Figure 24). In terms of consultants, PIMCO's 2009 *Defined Contribution Consulting Support and Trends Survey* of 32 investment consultants and firms focused on managed accounts, including seven of the top 10 investment consulting firms in the U.S., identified REITs more than any other asset class as adding "the most value" within defined contribution plans.³⁴

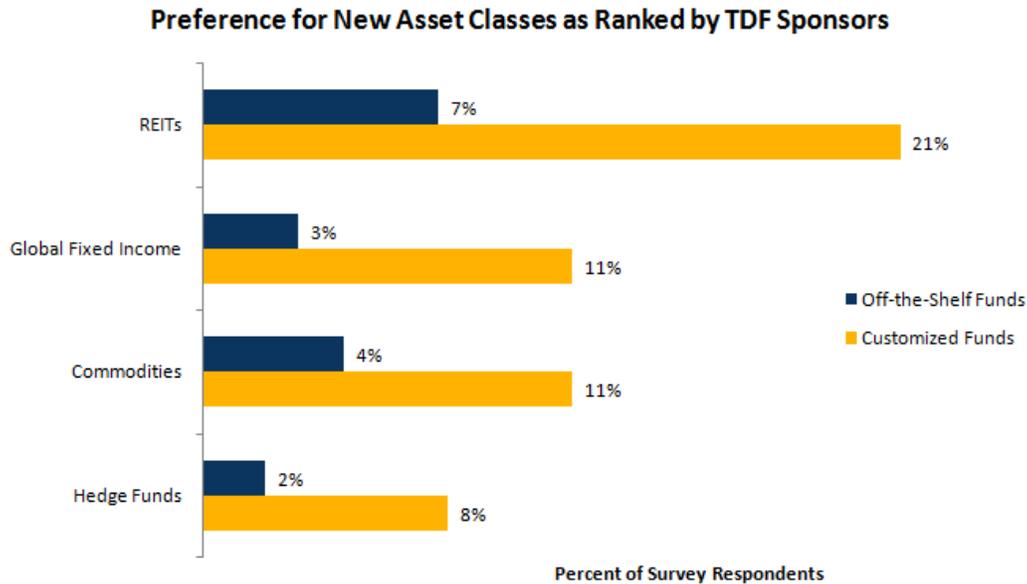
Figure 24
 Target Date and Target Risk Fund Providers
 Maximum Real Estate Allocations

Product Provider	Maximum Real Estate Allocation (%)
PIMCO	15.0
UBS	15.0
JP Morgan	12.0
Alliance Bernstein	10.0
Dow Jones Indexes Real Return	10.0
BlackRock	9.6
Great West Retirement Services	7.1
John Hancock	7.0
Russell Investment Group	7.0
State Farm	6.2
Northern Trust	6.0
Charles Schwab (Institutional & Retail)	5.0

Source: NAREIT, as of 3/31/2011

Finally, based on a 2009 survey of more than 400 defined contribution plan sponsors conducted jointly by the management consulting firm Casey Quirk & Associates and the Plan Sponsor Council of America, REITs were identified as the most “highly sought” additional TDF asset class by far among survey respondents.³⁵ As shown in Figure 25, plan sponsors using customized funds as well as off-the-shelf funds both chose REITs nearly twice as often as any other asset class for addition to their TDF offerings.

Figure 25



Source: Casey, Quirk, & Associates

TDFs as Portfolio Manager

TDFs are structured, in part, to provide investors saving for retirement through individual taxable or tax-advantaged accounts with a level of professional investment expertise not unlike that of professional portfolio managers who oversee traditional pension fund investing on behalf of plan beneficiaries, focusing on asset selection, portfolio diversification, risk management, and portfolio rebalancing. TDFs are designed to adjust over time the allocation of assets from a portfolio with above-average risk for investors early in their careers and facing a long investment horizon to a portfolio with below-average risk for investors in or nearing retirement and confronting a shorter investment horizon. In general, a portfolio with a longer investment horizon typically includes higher allocations to equities, whereas a portfolio with a shorter investment horizon typically includes higher allocations to fixed income securities. The time path over which the total equity allocation declines and the total fixed income allocation increases commonly is referred to as the *glide path*.

A well-designed glide path is structured to accommodate the changing levels of risk investors can tolerate throughout their careers and into retirement. At the beginning of one's employment and investment career, the investor faces a number of unknowns, including uncertainty with respect to future compensation, inflation, investment returns, and one's financial needs in retirement. Still, with a lifetime of saving and investment ahead, it arguably makes sense to



allocate one's assets to capture potential high equity returns in order to maximize portfolio wealth.

By mid-career, however, the level of uncertainty is reduced. Given one's accumulated wealth, present compensation, and expected remaining future compensation, one's retirement income needs and ability to meet those needs typically are much clearer. At retirement, the investor knows his accumulated wealth and has a decent idea of his expected life-span and his in-retirement financial requirements, leading to an even more precise measure of his expected retirement liability.

The investment objectives of TDFs are similar, albeit not identical, to those of defined benefit plans. Among the similar objectives, both TDFs and defined benefit plans seek to allocate assets across the opportunity set to grow wealth and provide retirement income sufficient to meet retirement liabilities. Thus, there are some important lessons that can be carried over from the investment policies and practices of defined benefit plans to improve the performance of TDFs.

Among these, liability driven investing (LDI) is a widely adopted asset allocation framework used by some of the largest corporate defined benefit plans. As the name implies, LDI is an investment policy in which the allocation of portfolio assets is guided, in part, by the future liabilities the plan is obligated to fund. By specifically accounting for the expected future liabilities of the plan, LDI allocates plan assets to better hedge over time the value of those assets against the value of future plan retirement obligations, thereby reducing the incidence of large, unexpected funding costs required of the plan sponsor (the employer). One method of implementing LDI is surplus optimization (SO), which is a variant of the more traditional asset-centric mean variance optimization (MVO).

Both SO and MVO develop asset allocations across the opportunity set. However, MVO allocates assets to maximize portfolio returns while controlling for the variance of those returns, whereas SO allocates assets to maximize the expected surplus return while controlling for the expected surplus risk. Surplus return is defined as the difference between the return on the assets and the return on (or growth of) the liability, whereas surplus risk is defined as the standard deviation of the surplus return and tells us how closely the asset returns track the liability returns. When using SO to develop optimal asset allocations, we use the Barclays Capital U.S. Aggregate Bond Index to measure the growth of future liabilities.

Essentially, SO includes future liabilities as a short position in the opportunity set, thereby adjusting the allocation of assets to take advantage of the natural hedges between the assets in the portfolio and the systematic risk factors that influence the value of the liability. Thus, SO develops portfolio allocations more suitable for investors in retirement or those close to retirement. Each portfolio is composed of assets which, in combination, are likely to track the value of the liability more closely – and, thereby, minimize periodic funding costs – than would be the case using a more asset-centric MVO allocation.

Although individual retirement portfolios confront somewhat different risks than do most defined benefit plans, they share many of the same objectives, the most important being the goal of funding future retirement income requirements. In general, defined benefit plan portfolios are required to generate periodic cash outflows in perpetuity to fulfill their ongoing pension payment obligations, while additional contributions are made by current and future employees as well as by the plan sponsor to fund current and future payments and to increase invested assets. In contrast, individual retirement savings accounts need only generate income for a finite, albeit uncertain, period sufficient to support one's own retirement income needs. Therefore, SO provides a constructive framework for designing the asset allocation glide path of Target Date Funds, a glide path that accounts for future retirement liabilities as part of the investment objective to more accurately reflect the intended purpose of the retirement portfolio.

When designing the glide path, elements of the asset allocations of both MVO and SO should play a role. For portfolios with medium- to long-term investment horizons, asset growth typically is most important, leading to a primary role for asset allocations using MVO. However, for portfolios with short- to medium-term investment horizons as well as portfolios for those in retirement, hedging retirement liabilities is most important, leading to a primary role for asset allocations using SO. Moreover, because the likelihood of living longer increases as individuals age, it also is important to manage the investor's time horizon by incorporating in the TDF design process a dynamic measurement of life expectancy consistent with demographic information appropriate to the relevant investor cohort when such information is available.

The Role of REITs in a Strategic Asset Allocation

To determine the role of real estate securities in the strategic asset allocation of the glide path, we first construct two sets of portfolios utilizing both MVO and SO and the opportunity set summarized in Figure 9 with expected return and risk assumptions developed by Wilshire Funds Management. The two sets of portfolios assess the roles of U.S. listed REITs and Global listed REITs and property companies, respectively, in the optimal strategic asset allocation. In addition to U.S. REITs and Global REITs, the opportunity set includes the following ten generic asset classes: U.S. TIPS, U.S. Investment Grade Bonds, U.S. High Yield Bonds, Non-U.S. Bonds, U.S. Large Cap Equities, U.S. Small Cap Equities, International Developed Markets Equities, Emerging Markets Equities, Commodities, and Cash.

The first set of portfolios derives allocations to U.S. REITs. We first create a 60/40 (stock/bond) efficient portfolio using MVO based only on the ten generic asset classes referenced above and not including U.S. REITs. As summarized in Figure 26.a, the baseline portfolio has an expected (ex-ante) portfolio risk level of 11.76 percent based on Wilshire's capital asset pricing model assumptions. Next, we expand the asset class opportunity set to include U.S. REITs, and we identify the optimal portfolio again using MVO and the same level of expected portfolio risk as the 60/40 portfolio. Finally, we identify the optimal portfolio including U.S. REITs using SO and again with the same level of expected portfolio risk as the 60/40 portfolio. Based on the asset



class allocation of these portfolios, we then determine how each portfolio would have performed over the 35-year period from 1976 to 2010.

Figure 26.a
Efficient Portfolios with and without U.S. REITs
Using Historical Monthly Returns, December 1975 – December 2010³⁶

Asset Allocation Methodology	Expected Portfolio Risk	Annualized Portfolio Risk	Annualized Portfolio Return	Portfolio Starting Value	Portfolio Ending Value
MVO w/o REITs	11.76%	10.13%	10.58%	\$10,000	\$337,726
MVO w/U.S. REITs	11.76%	9.90%	10.85%	\$10,000	\$367,396
Surplus Opt w/U.S. REITs	11.76%	9.72%	11.16%	\$10,000	\$405,947

Source: Barclays Capital Live, NAREIT, Wilshire Compass

The inclusion of U.S. REITs under both the MVO and SO frameworks increases the annualized (ex-post) portfolio return while reducing annualized (ex-post) portfolio risk. Furthermore, the optimal portfolio under the SO framework with the inclusion of U.S. REITs produces a higher annualized portfolio return and a lower annualized portfolio risk when compared with the optimal MVO portfolio. Over the actual 35-year experience of 1976-2010, the higher annualized portfolio return of the SO portfolio including U.S. REITs would have produced an ending portfolio value 10.49 percent higher than that of the portfolio using MVO and 20.20 percent higher than that of the MVO portfolio without U.S. REITs.

Figure 26.b compares the asset allocations of the three portfolios. It is noteworthy that the increasing allocations to U.S. REITs are accompanied by shrinking or zero allocations to U.S. TIPS, U.S. High Yield Bonds and U.S. Small Cap Equities. As the allocation to U.S. REITs increases, the declining allocations to all three of these other assets would appear to reflect the hybrid character of REIT returns – providing a high and steady level of income, long-term capital appreciation and a hedge against inflation – and indicate that REITs provide a more efficient asset class for adding these investment attributes to the glide path. Of particular note, both MVO and SO portfolios reduce the allocation to Small Cap Equities when the allocation to U.S. REITs is increased, indicating that efficient portfolios resolve the often noted correlation of returns between REITs and Small Cap Equities by favoring the overall diversification benefit of REITs.

Figure 26.b
Optimized Asset Class Allocations with and without U.S. REITs

	MVO w/o REITs	MVO w/U.S. REITs	Surplus Opt w/U.S. REITs
Cash	0.0%	0.0%	0.0%
TIPS	4.5%	4.5%	0.0%
U.S. Bonds	19.1%	26.4%	31.7%
High Yield	9.6%	3.3%	0.0%
Non-U.S. Bonds	6.8%	2.6%	5.8%
Large Cap	31.2%	31.2%	26.8%
Small Cap	9.4%	4.0%	0.0%
U.S. REITs	0.0%	7.5%	10.7%
Non-U.S. Dev'd Mkts	18.7%	18.1%	17.2%
Emg Mkts	0.7%	2.3%	7.9%
Commodities	0.0%	0.0%	0.0%

Source: Wilshire Compass

The second set of portfolios derives allocations to Global listed REITs and property companies. We again create a baseline 60/40 efficient portfolio using MVO and the same ten generic asset classes in the opportunity set, but without Global REITs. As summarized in Figure 27.a, the baseline portfolio in this case has an expected (ex-ante) portfolio risk level of 11.59 percent. We then expand the opportunity set to include Global REITs, and we develop efficient portfolios using MVO and SO that include Global REITs. We also again determine how all three portfolios would have performed from 1976 to 2010.

Figure 27.a
Efficient Portfolios with and without Global REITs
Using Historical Monthly Returns, December 1975 – December 2010³⁷

Asset Allocation Methodology	Expected Portfolio Risk	Annualized Portfolio Risk	Annualized Portfolio Return	Portfolio Starting Value	Portfolio Ending Value
MVO w/o REITs	11.59%	10.77%	10.49%	\$10,000	\$327,892
MVO w/Global REITs	11.59%	10.80%	10.52%	\$10,000	\$331,297
Surplus Opt w/Global REITs	11.59%	10.74%	10.78%	\$10,000	\$360,402

Source: Barclays Capital Live, NAREIT, Wilshire Compass

The overall effects of including Global REITs in the portfolio are similar to those of including U.S. REITs but with slightly lower returns and higher volatility. The inclusion of Global REITs using both MVO and SO increases the annualized (ex-post) portfolio return, and while the MVO portfolio including Global REITs has a slightly higher annualized (ex-post) risk, the SO portfolio including Global REITs has a lower annualized risk. The efficient portfolio using SO with the inclusion of Global REITs produces a higher annualized portfolio return and a lower annualized portfolio risk when compared with the optimal MVO portfolio. Likewise, over the actual 35-year investment timeline of 1976-2010, the higher annualized portfolio return of the SO portfolio including Global REITs would have produced an ending portfolio value 8.78 percent higher than that of the portfolio using MVO and 9.91 percent higher than that of the MVO portfolio without Global REITs.

Figure 27.b compares the asset allocations of the three portfolios. Again, it is noteworthy that the increasing allocations to Global REITs are accompanied by shrinking allocations to U.S. TIPS, U.S. High Yield Bonds, and U.S. Small Cap Equities, seemingly confirming the hybrid character of Global REIT returns as well as U.S. REIT returns with respect to a high and steady level of income, long-term capital appreciation, and a hedge against inflation. As with U.S. REITs, Global REITs appear to provide a more efficient asset class for the purpose of incorporating these particular investment attributes in diversified portfolios. Moreover, both MVO and SO portfolios again reduce the allocation to Small Cap Equities when the allocation to Global REITs is increased.

Figure 27.b
Optimized Asset Class Allocations with and without Global REITs

	MVO w/o REITs	MVO w/Global REITs	Surplus Opt w/Global REITs
Cash	0.0%	0.0%	0.0%
TIPS	6.5%	5.8%	0.0%
U.S. Bonds	21.0%	27.2%	32.3%
High Yield	7.7%	2.4%	0.0%
Non-U.S. Bonds	4.8%	1.6%	5.3%
Large Cap	32.8%	33.1%	29.2%
Small Cap	6.3%	4.1%	0.8%
Global REITs	0.0%	7.7%	11.6%
Non-U.S. Dev'd Mkts	18.4%	15.7%	13.6%
Emg Mkts	2.4%	2.3%	7.2%
Commodities	0.0%	0.0%	0.0%

Source: Wilshire Compass



Building a Strategic Asset Allocation Glide Path

As previously described, one of the unique attributes of TDFs is the periodic adjustment of asset allocations over time, driven by the glide path, to reflect the decreasing risk tolerance of investors as they approach and then enter their retirement years. Although TDFs generally are diversified asset allocation portfolios that rebalance periodically over time, not all TDFs are designed the same, and the differences in asset allocation policy could have a significant impact on an investor's ability to fund retirement income needs.

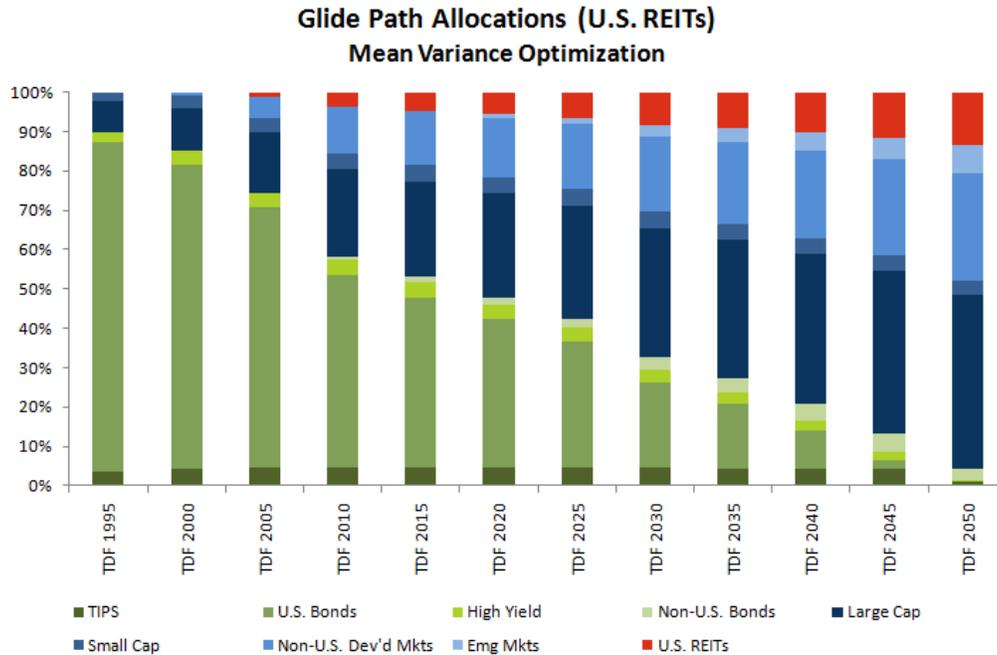
To develop the strategic asset allocation glide path for a Target Date Fund portfolio, we compute optimal portfolios using both MVO and SO for different investment horizons. For younger investors with longer investment horizons and less immediate retirement liabilities, allocating assets primarily using MVO to maximize future expected investment returns is entirely appropriate. For older investors, however, with appreciably shorter investment horizons near or already in retirement, as well as more clarity with respect to their retirement liabilities and remaining life expectancy, allocating assets primarily using SO to maximize expected surplus returns and hedge their liabilities is more appropriate.

Using U.S. Equity REITs in the Opportunity Set

Figures 28.a and 28.b summarize optimal glide path asset allocations using MVO and SO, respectively, with an opportunity set that includes listed U.S. Equity REITs. Glide paths are shown for investors already in their retirement years (TDF 1995 – TDF 2010) as well as investors with future retirement dates over the next 40 years (TDF 1015 – TDF 2050). Appendix 2 provides detailed asset allocations for the complete glide path when U.S. Equity REITs are included in the opportunity set.

For investors with target retirement dates many years in the future and a higher tolerance for risk, both MVO and SO develop allocations to the equity asset classes in the opportunity set (those shaded in red and blue) totaling 60 percent or more, with allocations to the fixed income asset classes (those shaded in green) totaling 40 percent or less. For investors well into their retirement years, both methodologies increase the total fixed income allocation to a range of 70 percent to 90 percent.

Figure 28.a

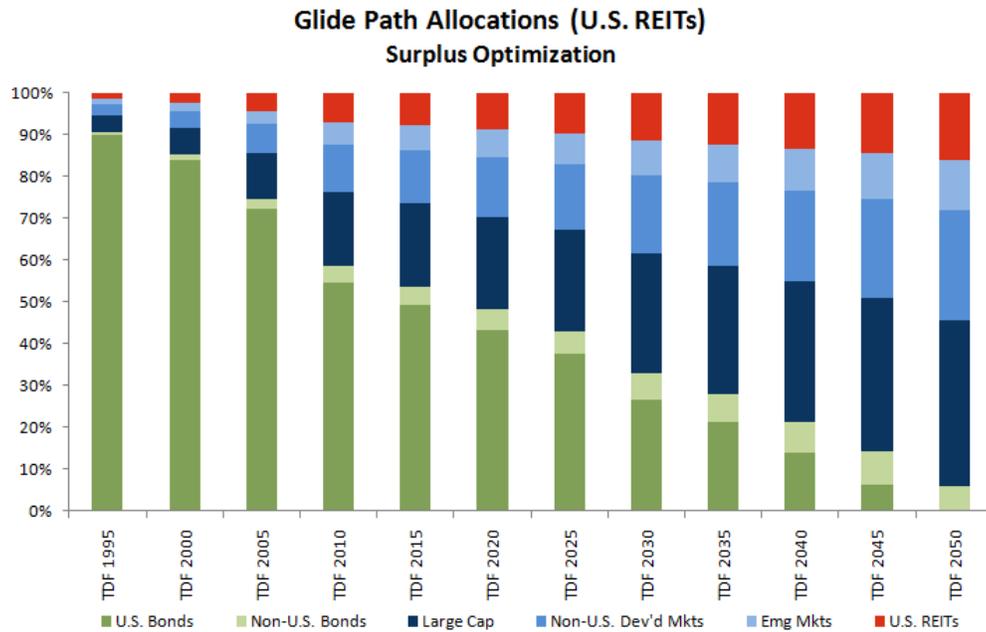


Source: Wilshire Compass

Not surprisingly, asset allocations using MVO are somewhat more robust when compared with asset allocations using SO because the additional information regarding the future retirement liability included in the SO approach imposes an additional constraint which tailors the allocation of assets specifically to take advantage of the natural, albeit incomplete, hedges between the assets in the portfolio and the systematic risk factors that influence the value of the liability. Using MVO, the dominant, although variable, asset allocations across the glide path are to U.S. Bonds, U.S. Large Cap Equities, and Non-U.S. Developed Market Equities. Allocations to TIPS, High Yield Bonds, and U.S. Small Cap Equities are relatively small and stable across the investment horizons, whereas allocations to Non-U.S. Bonds and Emerging Market Equities are relatively small for TDFs with long investment horizons and zero for TDFs well into retirement years.

Like other equities, MVO allocations to U.S. REITs are larger for TDFs with longer investment horizons, ranging from about five percent for horizons of five years to 10 years to as much as 14 percent for horizons of up to 40 years. Of particular note, allocations to U.S. REITs once again are larger than allocations to U.S. Small Cap Equities for all investment horizons of five years or longer, consistent with the results observed in Figure 26.b.

Figure 28.b



Source: Wilshire Compass

Using SO, changes to the allocations of the glide path are appreciable in some respects. The dominant allocations across the glide path again include U.S. Bonds, U.S. Large Cap Equities, and Non-U.S. Developed Market Equities. However, allocations to TIPS, High Yield Bonds, and U.S. Small Cap Equities are zero across the glide path, while allocations to Non-U.S. Bonds and Emerging Market Equities are larger for TDFs with longer investment horizons but quite small for TDFs well into retirement years.

Of particular note, allocations to U.S. REITs using SO are larger across the entire glide path compared with allocations using MVO, ranging from eight percent for a five-year investment horizon to as much as 16 percent for longer investment horizons. Moreover, the allocations to U.S. REITs are accompanied by zero allocations to U.S. TIPS, High Yield Bonds, and U.S. Small Cap Equities. The zero allocations to all three of these other asset classes reinforce results of Figure 26.b and indicate that REITs provide a more efficient asset class for combining the investment attributes of high and stable income, long-term capital appreciation, and inflation protection in the glide path.

Like the performance of the static portfolios summarized in Figures 26.a and 27.a, we tracked the performance of the TDF glide paths shown in Figures 28.a and 28.b over the 35-year



investment time horizon from 1976 to 2010 (Figure 28.c). Compared with the static portfolios, TDFs have lower risk levels owing to the glide path making reallocations to less risky assets over time. As before, the inclusion of U.S. REITs increases portfolio return while lowering portfolio risk; both the MVO portfolio and SO portfolio including U.S. REITs have a higher return and lower risk than the MVO portfolio without U.S. REITs. The SO portfolio including U.S. REITs has the highest return and lowest risk of the three portfolios and over the 35-year investment horizon would have resulted in a portfolio value 9.75 percent higher than that of the MVO portfolio without U.S. REITs and 5.95 percent higher than that of the MVO portfolio including U.S. REITs.

Figure 28.c

Target Date Funds with and without U.S. REITs
Using Historical Monthly Returns, December 1975 – December 2010³⁸

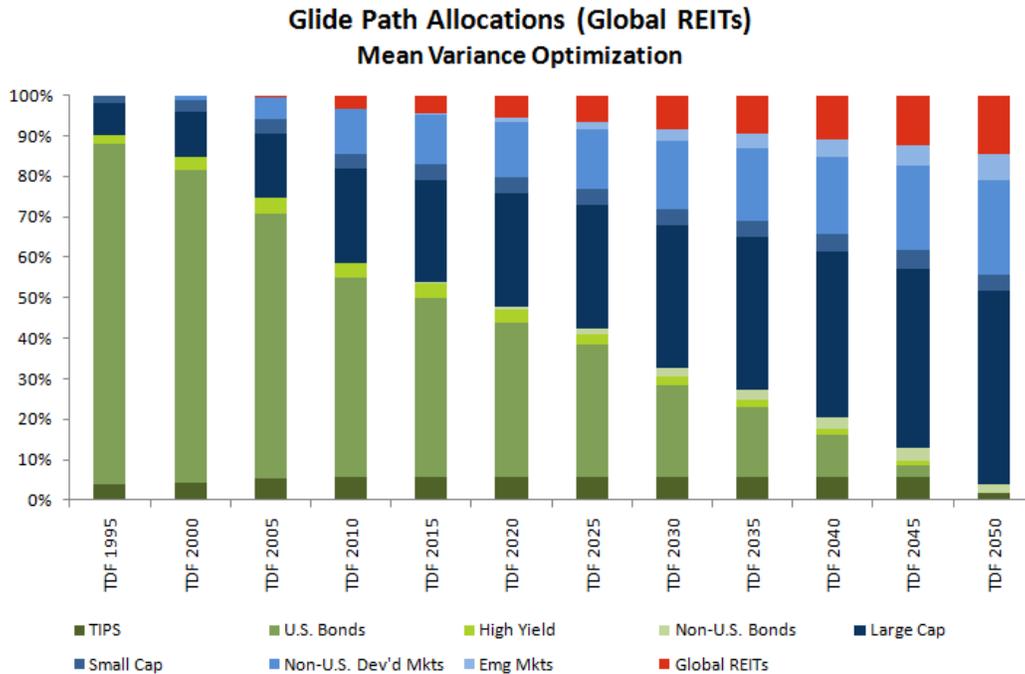
Asset Allocation Methodology	Annualized Portfolio Risk	Annualized Portfolio Return	Portfolio Starting Value	Portfolio Ending Value
MVO w/o REITs	6.90%	10.14%	\$10,000	\$293,645
MVO w/U.S. REITs	6.79%	10.25%	\$10,000	\$304,175
Surplus Opt w/U.S. REITs	6.56%	10.43%	\$10,000	\$322,279

Source: Barclays Capital Live, NAREIT, Wilshire Compass

Using Global Developed Market REITs in the Opportunity Set

Figures 29.a and 29.b summarize optimal glide path asset allocations using MVO and SO, respectively, with an opportunity set that includes listed REITs and property companies in global developed markets. Glide paths are shown for investors already in their retirement years (TDF 1995 – TDF 2010) as well as investors with future retirement dates over the next 40 years (TDF 1015 – TDF 2050). Appendix 3 provides detailed asset allocations for the complete glide path when Global listed REITs and property companies are included in the opportunity set. Compared with the FTSE NAREIT All Equity REITs Index, which provides exposure to commercial real estate through listed equity REITs in the U.S., the FTSE EPRA/NAREIT Developed Real Estate Index provides exposure to the commercial real estate asset class through listed REITs and property companies in North America and the developed economies of Europe and Asia.

Figure 29.a



Source: Wilshire Compass

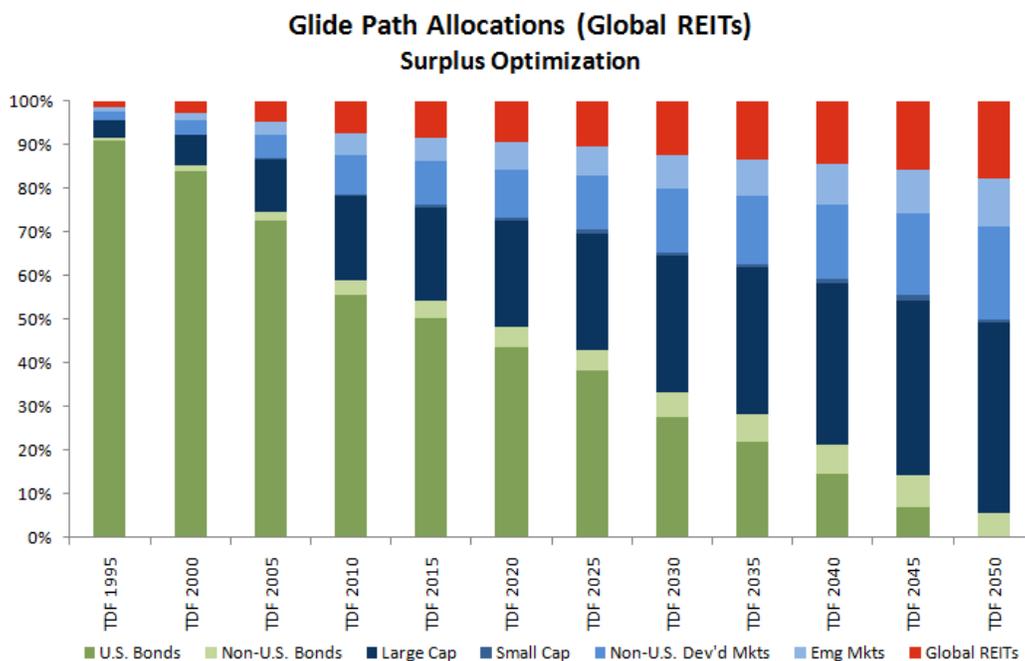
In broadest outlines, the glide path asset allocations developed when Global REITs are included in the opportunity set are similar with those developed when U.S. REITs are included in the opportunity set. For investors with target retirement dates many years in the future and a higher tolerance for risk, both MVO and SO develop allocations to the equity asset classes again totaling 60 percent or more and allocations to the fixed income asset classes totaling 40 percent or less. For investors well into their retirement years, both approaches increase the total fixed income allocation to a range of 70 percent to 90 percent.

When using MVO to develop the glide path, allocations to Global REITs are not appreciably different from allocations to U.S. REITs, ranging from about five percent for horizons of five years to 10 years to as much as 15 percent for horizons of up to 40 years. Of particular note, allocations to Global REITs again are consistently larger than allocations to U.S. Small Cap Equities for all investment horizons of five years or longer, consistent with the results observed in Figure 27.b.

Allocations to Global REITs using SO are larger across the entire glide path compared with allocations using MVO and also somewhat larger than allocations to U.S. REITs alone, ranging from 8 percent for a five-year investment horizon to as much as 18 percent for longer

investment horizons. Moreover, the increasing allocations to Global REITs using SO are accompanied by zero allocations to U.S. TIPS and High Yield Bonds, and near-zero allocations to U.S. Small Cap Equities. The zero or near zero allocations to all three of these other asset classes reinforce the results of Figure 27.b and indicate that a Global REIT allocation also provides a more efficient asset class for combining the investment attributes of high and stable income, long-term capital appreciation and inflation protection in the glide path.

Figure 29.b



Source: Wilshire Compass

Figure 29.c summarizes the performance of the TDFs over the 35-year investment horizon from 1976 to 2010. Again, the inclusion of Global REITs improves the risk-return profile of the MVO and SO portfolios which include Global REITs compared to the MVO portfolio without Global REITs. The SO portfolio including Global REITs has the highest return and lowest risk. Assuming an initial investment of \$10,000 in 1976, the SO portfolio with Global REITs would have grown to a final portfolio value at the end of 2010 that is 4.58 percent greater than the MVO portfolio without Global REITs and 4.32 percent greater than the MVO portfolio including Global REITs.

Figure 29.c

Target Date Funds with and without Global REITs
Using Historical Monthly Returns, December 1975 – December 2010³⁹

Asset Allocation Methodology	Annualized Portfolio Risk	Annualized Portfolio Return	Portfolio Starting Value	Portfolio Ending Value
MVO w/o REITs	7.31%	10.13%	\$10,000	\$292,447
MVO w/Global REITs	7.27%	10.13%	\$10,000	\$293,182
Surplus Opt w/Global REITs	7.09%	10.27%	\$10,000	\$305,835

Source: Barclays Capital Live, NAREIT, Wilshire Compass

CONCLUSIONS

In recent decades, the number of employees covered by an employer-sponsored defined benefit pension plan has been declining. Many plan sponsors are no longer willing or able to assume the financial risk of underwriting such plans.

Employers increasingly have offered their employees tax-advantaged defined contribution savings plans as an alternative to save and invest for retirement. However, many employees are poorly equipped to make appropriate investment decisions and to manage the financial risk of their investments in a defined contribution plan. Thus, sponsors of such plans have sought in recent years to provide their employees with investment products designed to replicate, in part, the investment decisions typically made by the professional investment managers of defined benefit plans, including asset selection, asset allocation, risk management, and portfolio diversification.

Owing in part to provisions of the Pension Protection Act of 2006, the most common of these investment products are known as target date funds, which use a professionally designed protocol – the glide path – to determine the assets in which to invest and how much of the accumulated savings to invest in each asset at different points in time throughout the investment horizon.

The analysis presented in this paper evaluates the appropriate role of commercial real estate investment through REITs and listed real estate securities in the glide path asset allocations of target date funds. Based on the data and analysis summarized throughout the paper, we demonstrate that an allocation to U.S. or global listed REITs and real estate securities increases the expected long-term investment performance and diversification benefits of a retirement savings and investment portfolio, including those of target date investment portfolios.



Commercial real estate investment through listed REITs and real estate equities provides all investors with a liquid, transparent, and efficient investment platform for accessing the commercial real estate asset class.

The investment performance of listed REITs and real estate equities in the U.S. and around the world has been characterized by high and stable dividends, competitive total returns, inflation protection, and low to moderate correlation with other assets. The combination of these investment characteristics offers the potential for important portfolio diversification benefits in the glide path.

Using both mean variance optimization and surplus optimization, the 35-year historical record of investment performance reveals that optimal allocations to commercial real estate, either in U.S. listed REITs alone or including both U.S. and non-U.S. listed REITs and real estate equities, range from five percent to eight percent for investment horizons of five to 10 years and as much as 18 percent for investment horizons of up to 40 years.

Increasing allocations to U.S. or global listed REITs and real estate equities are accompanied by zero or near zero allocations to U.S. TIPS, High Yield Bonds, and U.S. Small Cap Equities, indicating that listed REITs and real estate securities provide a more efficient asset class for adding to the glide path the investment attributes of high and stable income, long-term capital appreciation and inflation protection.

This analysis supports the case that the target date fund glide path for future retirees should include a meaningful allocation to the commercial real estate asset class through U.S. or global listed REITs and real estate equities in the range of five percent to 18 percent.

APPENDIX 1⁴⁰

Performance Attributes of the Asset Classes Included in the Opportunity Set December 1975 – December 2010⁴¹

Risk/ Return Characteristics

	Annualized Return	Annualized Std Dev	Sharpe Ratio
Cash	6.02%	1.09%	N/A
TIPS	6.83%	6.09%	0.13
U.S. Bonds	8.32%	5.68%	0.41
High Yield	8.85%	8.55%	0.33
Non-U.S. Bonds	8.46%	10.77%	0.23
Large Cap Equities	11.38%	15.68%	0.34
Small Cap Equities	12.88%	19.85%	0.35
U.S. REITs	13.98%	17.21%	0.46
Global REITs	7.47%	19.02%	0.08
Non-U.S. Dev'd Equities	10.13%	17.25%	0.24
Emg Mkts	14.41%	24.52%	0.34
Commodities	7.50%	19.25%	0.08

Correlation Coefficients

	Cash	TIPS	U.S. Bonds	High Yield	Non-U.S. Bonds	Large Cap Equities	Small Cap Equities	U.S. REITs	Global REITs	Non-U.S. Dev'd Equities	Emg Mkts	Commod
Cash	1.00	0.02	0.28	-0.10	0.06	0.05	0.00	0.00	-0.10	0.01	-0.12	0.00
TIPS	0.02	1.00	0.76	0.28	0.50	0.02	0.00	0.20	0.23	0.09	0.11	0.25
U.S. Bonds	0.28	0.76	1.00	0.25	0.42	0.23	0.16	0.17	0.20	0.16	-0.01	-0.02
High Yield	-0.10	0.28	0.25	1.00	0.06	0.57	0.63	0.58	0.59	0.50	0.68	0.16
Non-U.S. Bonds	0.06	0.50	0.42	0.06	1.00	0.08	0.04	0.12	0.33	0.50	0.17	0.11
Large Cap Equities	0.05	0.02	0.23	0.57	0.08	1.00	0.88	0.57	0.65	0.63	0.81	0.16
Small Cap Equities	0.00	0.00	0.16	0.63	0.04	0.88	1.00	0.66	0.66	0.58	0.79	0.19
U.S. REITs	0.00	0.20	0.17	0.58	0.12	0.57	0.66	1.00	0.74	0.45	0.51	0.14
Global REITs	-0.10	0.23	0.20	0.59	0.33	0.65	0.66	0.74	1.00	0.78	0.73	0.20
Non-U.S. Dev'd Equities	0.01	0.09	0.16	0.50	0.50	0.63	0.58	0.45	0.78	1.00	0.87	0.23
Emg Mkts	-0.12	0.11	-0.01	0.68	0.17	0.81	0.79	0.51	0.73	0.87	1.00	0.41
Commodities	0.00	0.25	-0.02	0.16	0.11	0.16	0.19	0.14	0.20	0.23	0.41	1.00

APPENDIX 2⁴²

**Target Date Fund Glide Path Allocations
U.S. Equity REITs in the Opportunity Set**

MVO w/o U.S. REITs

				Non-U.S.			Non-U.S.		
	TIPS	U.S. Bonds	High Yield	Bonds	Large Cap	Small Cap	U.S. REITs	Dev'd Mkts	Emg Mkts
TDF 1995	3.68%	83.52%	2.52%	0.00%	8.00%	2.28%	0.00%	0.00%	0.00%
TDF 2000	4.14%	77.52%	3.45%	0.00%	10.64%	3.23%	0.00%	1.03%	0.00%
TDF 2005	4.58%	64.91%	4.80%	0.68%	15.16%	4.50%	0.00%	5.36%	0.00%
TDF 2010	4.60%	45.12%	6.96%	3.23%	22.09%	6.63%	0.00%	11.37%	0.00%
TDF 2015	4.61%	38.71%	7.65%	4.05%	24.33%	7.32%	0.00%	13.32%	0.00%
TDF 2020	4.62%	32.12%	8.37%	4.90%	26.64%	8.03%	0.00%	15.32%	0.00%
TDF 2025	4.60%	25.67%	9.03%	5.78%	28.91%	8.71%	0.00%	17.14%	0.16%
TDF 2030	4.47%	13.80%	10.06%	7.63%	33.12%	9.87%	0.00%	19.96%	1.08%
TDF 2035	4.40%	7.32%	10.62%	8.64%	35.42%	10.51%	0.00%	21.50%	1.58%
TDF 2040	4.12%	0.00%	11.21%	9.72%	38.12%	11.26%	0.00%	23.38%	2.19%
TDF 2045	0.00%	0.00%	9.80%	7.05%	40.69%	11.98%	0.00%	27.17%	3.30%
TDF 2050	0.00%	0.00%	6.52%	0.52%	43.12%	12.69%	0.00%	32.66%	4.49%

MVO w/U.S. REITs

				Non-U.S.			Non-U.S.		
	TIPS	U.S. Bonds	High Yield	Bonds	Large Cap	Small Cap	U.S. REITs	Dev'd Mkts	Emg Mkts
TDF 1995	3.68%	83.52%	2.52%	0.00%	8.00%	2.28%	0.00%	0.00%	0.00%
TDF 2000	4.14%	77.52%	3.45%	0.00%	10.64%	3.23%	0.00%	1.03%	0.00%
TDF 2005	4.59%	66.04%	3.87%	0.00%	15.14%	3.69%	1.22%	5.46%	0.00%
TDF 2010	4.73%	48.69%	4.03%	0.81%	22.05%	4.04%	3.82%	11.83%	0.00%
TDF 2015	4.74%	43.11%	4.01%	1.16%	24.29%	4.12%	4.68%	13.70%	0.19%
TDF 2020	4.67%	37.55%	3.78%	1.64%	26.58%	4.09%	5.62%	15.16%	0.90%
TDF 2025	4.60%	32.08%	3.56%	2.12%	28.83%	4.06%	6.54%	16.60%	1.60%
TDF 2030	4.47%	21.86%	3.15%	3.01%	33.04%	4.01%	8.27%	19.29%	2.91%
TDF 2035	4.40%	16.28%	2.93%	3.50%	35.33%	3.97%	9.21%	20.76%	3.62%
TDF 2040	4.31%	9.69%	2.66%	4.07%	38.05%	3.94%	10.33%	22.49%	4.46%
TDF 2045	4.21%	2.08%	2.36%	4.74%	41.18%	3.90%	11.61%	24.49%	5.43%
TDF 2050	0.87%	0.00%	0.40%	3.08%	44.29%	3.36%	13.59%	27.52%	6.89%



SO w/U.S. REITs

	Non-U.S.						Non-U.S.		
	TIPS	U.S. Bonds	High Yield	Bonds	Large Cap	Small Cap	U.S. REITs	Dev'd Mkts	Emg Mkts
TDF 1995	0.00%	89.84%	0.00%	0.86%	3.98%	0.00%	1.58%	2.55%	1.18%
TDF 2000	0.00%	83.99%	0.00%	1.36%	6.27%	0.00%	2.50%	4.03%	1.86%
TDF 2005	0.00%	72.30%	0.00%	2.36%	10.85%	0.00%	4.32%	6.97%	3.21%
TDF 2010	0.00%	54.75%	0.00%	3.85%	17.71%	0.00%	7.06%	11.38%	5.25%
TDF 2015	0.00%	49.21%	0.00%	4.32%	19.88%	0.00%	7.92%	12.77%	5.89%
TDF 2020	0.00%	43.36%	0.00%	4.82%	22.17%	0.00%	8.83%	14.24%	6.57%
TDF 2025	0.00%	37.51%	0.00%	5.32%	24.46%	0.00%	9.74%	15.71%	7.25%
TDF 2030	0.00%	26.74%	0.00%	6.24%	28.68%	0.00%	11.42%	18.42%	8.49%
TDF 2035	0.00%	21.20%	0.00%	6.71%	30.85%	0.00%	12.29%	19.82%	9.14%
TDF 2040	0.00%	14.12%	0.00%	7.31%	33.62%	0.00%	13.39%	21.60%	9.96%
TDF 2045	0.00%	6.42%	0.00%	7.97%	36.64%	0.00%	14.59%	23.53%	10.85%
TDF 2050	0.00%	0.00%	0.00%	5.99%	39.46%	0.00%	16.12%	26.61%	11.81%

APPENDIX 3⁴³

Target Date Fund Glide Path Allocations Global Developed REITs in the Opportunity Set

MVO w/o Global REITs

	Non-U.S.						Non-U.S.		
	TIPS	U.S. Bonds	High Yield	Bonds	Large Cap	Small Cap	U.S. REITs	Dev'd Mkts	Emg Mkts
TDF 1995	3.78%	84.25%	2.25%	0.00%	7.90%	1.83%	0.00%	0.00%	0.00%
TDF 2000	4.42%	77.26%	3.22%	0.00%	11.14%	2.70%	0.00%	1.26%	0.00%
TDF 2005	5.36%	65.20%	4.30%	0.00%	15.85%	3.43%	0.00%	5.85%	0.00%
TDF 2010	6.14%	46.28%	6.05%	1.46%	23.07%	4.75%	0.00%	12.26%	0.00%
TDF 2015	6.26%	39.97%	6.51%	2.25%	25.49%	5.15%	0.00%	13.93%	0.45%
TDF 2020	6.35%	33.54%	6.92%	3.12%	27.97%	5.53%	0.00%	15.46%	1.12%
TDF 2025	6.44%	27.23%	7.32%	3.97%	30.41%	5.90%	0.00%	16.96%	1.78%
TDF 2030	6.61%	15.74%	8.04%	5.53%	34.84%	6.58%	0.00%	19.69%	2.97%
TDF 2035	6.70%	9.61%	8.43%	6.36%	37.20%	6.95%	0.00%	21.15%	3.61%
TDF 2040	6.81%	1.70%	8.93%	7.43%	40.25%	7.41%	0.00%	23.03%	4.43%
TDF 2045	2.82%	0.00%	8.02%	6.16%	43.28%	7.80%	0.00%	26.21%	5.72%
TDF 2050	0.00%	0.00%	5.37%	1.64%	46.43%	8.13%	0.00%	31.10%	7.33%

MVO w/Global REITs

	Non-U.S.						Global	Non-U.S.	
	TIPS	U.S. Bonds	High Yield	Bonds	Large Cap	Small Cap	REITs	Dev'd Mkts	Emg Mkts
TDF 1995	3.78%	84.25%	2.25%	0.00%	7.90%	1.83%	0.00%	0.00%	0.00%
TDF 2000	4.42%	77.26%	3.22%	0.00%	11.14%	2.70%	0.00%	1.26%	0.00%
TDF 2005	5.26%	65.43%	4.07%	0.00%	15.87%	3.35%	0.35%	5.67%	0.00%
TDF 2010	5.78%	49.18%	3.60%	0.02%	23.20%	3.74%	3.52%	10.97%	0.00%
TDF 2015	5.81%	44.26%	3.38%	0.32%	25.41%	3.85%	4.45%	12.20%	0.33%
TDF 2020	5.79%	38.11%	3.01%	0.80%	28.19%	3.94%	5.62%	13.47%	1.06%
TDF 2025	5.78%	32.63%	2.69%	1.23%	30.68%	4.02%	6.67%	14.61%	1.70%
TDF 2030	5.76%	22.66%	2.09%	2.00%	35.20%	4.16%	8.57%	16.67%	2.88%
TDF 2035	5.75%	17.34%	1.78%	2.42%	37.61%	4.24%	9.58%	17.78%	3.50%
TDF 2040	5.73%	10.47%	1.37%	2.95%	40.73%	4.34%	10.89%	19.20%	4.31%
TDF 2045	5.72%	2.86%	0.91%	3.55%	44.18%	4.45%	12.35%	20.78%	5.21%
TDF 2050	1.78%	0.00%	0.00%	1.98%	47.81%	4.13%	14.66%	23.21%	6.42%



SO w/Global REITs

	TIPS	U.S. Bonds	High Yield	Non-U.S.			Global	Non-U.S.	
				Bonds	Large Cap	Small Cap	REITs	Dev'd Mkts	Emg Mkts
TDF 1995	0.00%	90.73%	0.00%	0.73%	3.99%	0.11%	1.58%	1.86%	0.99%
TDF 2000	0.00%	83.93%	0.00%	1.27%	6.92%	0.18%	2.74%	3.23%	1.72%
TDF 2005	0.00%	72.50%	0.00%	2.17%	11.85%	0.31%	4.69%	5.53%	2.94%
TDF 2010	0.00%	55.50%	0.00%	3.52%	19.17%	0.51%	7.60%	8.94%	4.76%
TDF 2015	0.00%	50.25%	0.00%	3.93%	21.44%	0.57%	8.49%	10.00%	5.32%
TDF 2020	0.00%	43.76%	0.00%	4.44%	24.23%	0.64%	9.60%	11.30%	6.02%
TDF 2025	0.00%	38.20%	0.00%	4.88%	26.63%	0.70%	10.55%	12.42%	6.61%
TDF 2030	0.00%	27.69%	0.00%	5.71%	31.16%	0.82%	12.34%	14.53%	7.74%
TDF 2035	0.00%	22.13%	0.00%	6.15%	33.56%	0.89%	13.29%	15.65%	8.33%
TDF 2040	0.00%	14.71%	0.00%	6.74%	36.75%	0.97%	14.56%	17.14%	9.12%
TDF 2045	0.00%	6.99%	0.00%	7.35%	40.08%	1.06%	15.88%	18.69%	9.95%
TDF 2050	0.00%	0.00%	0.00%	5.52%	43.67%	0.81%	17.72%	21.38%	10.91%

¹Towers Watson. (2011). DB Versus DC Plan Investment Returns: The 2008-2009 Update (Insider, April 2011).

Retrieved from http://www.towerswatson.com/assets/pdf/mailings/TW_20643-April-Insider.pdf

² In his book *Unconventional Success: A Fundamental Approach to Personal Investment* (Free Press, 2005), Swensen recommends a 20% allocation to REITs.

³ The Real Estate Investment Trust Act of 1960 was part of the Cigar Excise Tax Extension Act of 1960 signed by President Eisenhower on September 14, 1960.

⁴ REITs that invest in more balanced portfolios of both real property assets and mortgage financing assets previously were classified by the National Association of Real Estate Investment Trusts® (NAREIT) as Hybrid REITs, a third subcategory of the FTSE NAREIT U.S. Real Estate Index Series. However, the FTSE NAREIT Hybrid REITs Index was discontinued as of December 20, 2010.

⁵FTSE™, NAREIT® (2011). Performance by Property Sector/Sub-Sector [Webpage]. Retrieved from <http://www.reit.com/IndustryDataPerformance/PerformancebyPropertySectorSub-Sector.aspx>

⁶NAREIT (2010), Historical REIT Industry Market Capitalization: 1972-2010 [Webpage]. Retrieved from <http://reit.com/IndustryDataPerformance/MarketCapitalizationofUSREITIndustry.aspx>

⁷Prudential Real Estate Investors. (2011). A Bird's Eye View of Global Real Estate Markets: 2011 Update.

⁸National Association of Real Estate Investment Trusts (NAREIT) (2010). Historical REIT Industry Market Capitalization: 1972-2010 [Webpage]. Retrieved from

<http://reit.com/IndustryDataPerformance/MarketCapitalizationofUSREITIndustry.aspx>

⁹FTSE EPRA/NAREIT Global Developed Real Estate Index.

¹⁰FTSE EPRA/NAREIT Global Developed Real Estate Index.

¹¹Pension Real Estate Association (2010). *Investor Report*. Hartford, CT.: Gail Haynes

¹² The average net expense ratio as reported by Morningstar as of December 31, 2010 was 1.31 for actively managed real estate mutual funds and 0.55 for passively managed real estate mutual funds.

¹³Investment Company Institute. 2011. "The U.S. Retirement Market, First Quarter 2011" (June).

http://www.ici.org/info/ret_11_q1_data.xls.

¹⁴United Nations (2009). Population Ageing and Development 2009

¹⁵ Wells Fargo & Company. (2010). 2010 Wells Fargo Retirement Study

¹⁶VanDerhei, J. & Copeland, C. (2010). The EBRI Retirement Readiness Rating: Retirement Income Preparation and Future Prospects. *Employee Benefit Research Institute (EBRI) Issue Brief*, 344, 6

¹⁷VanDerhei, J. & Copeland, C. (2010). The EBRI Retirement Readiness Rating: Retirement Income Preparation and Future Prospects. *Employee Benefit Research Institute Issue Brief*, 344, 6

¹⁸VanDerhei, J. & Copeland, C. (2010). The EBRI Retirement Readiness Rating: Retirement Income Preparation and Future Prospects. *EBRI Issue Brief*, 344, 6

¹⁹VanDerhei, J. (2009). The Impact of the Recent Financial Crisis on 401(k) Account Balances. *EBRI Issue Brief*, 326, 11

²⁰National Center for Health Statistics. (2011). Health, United States, 2010: With Special Feature on Death and Dying. Hyattsville, MD. 152

²¹ Inception dates for the following indices are post-12/31/1975, and chart reflects data as of the respective inception dates - Merrill Lynch 91 Day T-Bill Index, 2/1/1978; Barclays Capital U.S. TIPS Index, 10/1/1997; Merrill Lynch High Yield Master II Index, 9/1/1986; Wilshire U.S. Large Cap Index, 7/1/1978; Wilshire U.S. Small Cap Index, 7/1/1978; FTSE EPRA/NAREIT Developed Index, 1/1/1990; and MSCI Emerging Markets Index, 1/1/1988.

²²For 1991, Wilshire U.S. Large Value Index data reflects Russell 1000 Value Index data as Wilshire U.S. Large Value Index (Price Return) inception date is 1/1/1992.

²³For 1991, Wilshire U.S. Large Value Index data reflects Russell 1000 Value Index data as Wilshire U.S. Large Value Index (Price Return) inception date is 1/1/1992

²⁴The portfolio volatility of a portfolio, P, of two assets, A and B, is given by the following formula:

$\sigma_p = (w_A^2 \sigma_A^2 + w_B^2 \sigma_B^2 + 2w_A w_B \sigma_A \sigma_B \rho_{AB})^{1/2}$, where σ is the standard deviation, w is the portfolio weight, and ρ is the correlation between the two assets

²⁵ Correlations are based on monthly returns for the indices. Data for the following indices are based on data as of their inception dates, which are post 12/31/1975- 9/1/1986 for Merrill Lynch High Yield Master II Index, 7/1/1978 for Wilshire U.S. Large Cap Index, 7/1/1978 for Wilshire U.S. Small Cap Index, and 1/1/1988 for MSCI Emerging Markets Index

²⁶ Based on monthly returns

²⁷ Based on monthly returns

²⁸ Inception date for Barclays Capital U.S. TIPS Index is 10/1/1997

²⁹ Ciocchetti, B., Craft, T., & Shilling, J. (2000). Institutional Investors and REIT Equity Prices. University of Wisconsin Center for Urban Land Economic Research, 10

³⁰ Below, S., Stansell, S., & Coffin, M. (2000). The Determinants of REIT Institutional Ownership: Tests of the CAPM. *Journal of Real Estate Finance and Economics* 21:3, 263-278

³¹ Troianovski, A. (2010). REITs Look to Return to their Retail Roots. *The Wall Street Journal*. January 6, 2010.

Retrieved from <http://online.wsj.com/article/SB10001424052748704160504574640641969464588.html>

³² Towers Watson. (2010). Automatic Enrollment in 401(k) Plans Now Dominates at Large Employers, Towers Watson Survey Finds [Press release]. Retrieved from <http://www.towerswatson.com/press/2376>

³³ Callan Associates. (2009). 2009 Callan Target Date Fund Manager Survey.

³⁴ PIMCO. (2009). Defined Contribution Consulting Support and Trends.

³⁵ Casey, Quirk & Associates. (2009). Target-Date Retirement Funds: The New Defined Contribution Battleground.

³⁶ Barclays U.S. TIPS Index inception date is 10/1/1997; data prior to this date reflects Barclays Capital U.S. Aggregate Index data. Merrill Lynch High Yield Master II Index inception date is 9/1/1986; data prior to this date reflects Barclays Capital U.S. High Yield Index data, which has an inception date of 7/1/1983, and data for ML HY Master II Index prior to this date reflects Barclays Capital U.S. Aggregate Index data. Citigroup Global Markets Non-U.S. Government Bond Index inception date is 1/1/1978; data prior to this date reflects Barclays Capital U.S. Aggregate Index data. Wilshire U.S. Large Cap Index inception date is 7/1/1978; data prior to this reflects S&P 500 Index data. Wilshire U.S. Small Cap Index inception date is 7/1/1978; data prior to this reflects S&P 500 Index data. MSCI Emerging Markets Index inception date is 1/1/1988; data prior to this date reflects MSCI EAFE Index data.

³⁷ Barclays U.S. TIPS Index inception date is 10/1/1997; data prior to this date reflects Barclays Capital U.S. Aggregate Index data. Merrill Lynch High Yield Master II Index inception date is 9/1/1986; data prior to this date reflects Barclays Capital U.S. High Yield Index data, which has an inception date of 7/1/1983, and data for ML HY Master II Index prior to this date reflects Barclays Capital U.S. Aggregate Index data. Citigroup Global Markets Non-U.S. Government Bond Index inception date is 1/1/1978; data prior to this date reflects Barclays Capital U.S. Aggregate Index data. Wilshire U.S. Large Cap Index inception date is 7/1/1978; data prior to this reflects S&P 500 Index data. Wilshire U.S. Small Cap Index inception date is 7/1/1978; data prior to this reflects S&P 500 Index data. FTSE EPRA/NAREIT Developed Index inception date is 1/1/1990; data prior to this date reflects FTSE NAREIT Equity REITs Index data. MSCI Emerging Markets Index inception date is 1/1/1988; data prior to this date reflects MSCI EAFE Index data.

³⁸ Please refer to Note 36.

³⁹ Please refer to Note 37.

⁴⁰ Wilshire Compass

⁴¹ Please refer to Note 21.

⁴² Wilshire Compass

⁴³ Wilshire Compass



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