



2022 Trustee Educational Seminar (TEDS)

May 21 – 22
Omni Shoreham Hotel
Washington, D.C.

SCHEDULE OF EVENTS

SATURDAY, MAY 21

- 7:00 am – 1:00 pm REGISTRATION
- 7:00 am – 8:00 am BREAKFAST
- 8:00 am – 1:00 pm DAY 1 - GENERAL SESSION
- 5:00 pm – 6:00 pm PRESIDENT'S RECEPTION

SUNDAY, MAY 22

- 7:00 am – 8:00 am BREAKFAST
- 7:00 am – 1:00 pm REGISTRATION
- 8:00 am – 1:00 pm DAY 2 – GENERAL SESSION



2019 Trustee Educational Seminar (TEDS)

May 18 – 19
Hilton Austin
Austin, TX

FINAL AGENDA

SATURDAY, MAY 18

- 7:00 am – 8:00 am **BREAKFAST**
Governor’s Ballroom E – 4th Floor
- 7:00 am – 1:00 pm **REGISTRATION**
Governor’s Ballroom Foyer – 4th Floor
- 8:00 am – 1:00 pm **DAY 1 - GENERAL SESSION**
Governor’s Ballroom D – 4th Floor
- 8:15 am – 9:00 am *History and Mechanics of the Defined Benefit Plan*
Kelly Weller, Great Lakes Advisors
- 9:00 am – 10:00 am *Fund Structure: Investment Policy Statement, Asset Allocation & Benchmarking*
Jennifer Mink, Investment Performance Services
- 10:00 am – 10:15 am **BREAK**
- 10:15 am – 11:15 am *Investments 101: Fixed Income & Public Equities*
Doug Mosely, NEPC
- 11:15 am – 11:30 am **BREAK**
- 11:30 am – 12:30 pm *Investments 201: Alternatives*
Doug Mosely, NEPC
- 12:30 pm – 1:30 pm *In the Beginning - Trustee 101*
Peter Borkon, Bleichmar Fonti & Auld LLP
Lydia Lee, Lieff, Cabraser, Heimann & Bernstein, LLP

5:00 pm – 6:00 pm **PRESIDENT’S RECEPTION**
Reverbery – Lower Lobby

SUNDAY, MAY 19

7:00 am – 8:00 am **BREAKFAST**
Governor’s Ballroom E – 4th Floor

7:00 am – 1:00 pm **REGISTRATION**
Governor’s Ballroom Foyer – 4th Floor

8:00 am – 1:00 pm **DAY 2 – GENERAL SESSION**
Governor’s Ballroom D – 4th Floor

8:00 am – 9:00 am *Time Value of Money*
Kelly Weller, Great Lakes Advisors

9:00 am – 10:00 am *A Pension Trustee’s Guide to the Actuarial Valuation*
Leslie Thompson, Gabriel Roeder Smith
Pam Feely, Fire and Police Pension Association of Colorado

10:00 am – 10:15 am **BREAK**

10:15 am – 12:15 pm *Asset Allocation Challenge*
(Interactive computer based investment training session)
Bob Parise, Northern Trust Asset Management

12:15 pm – 12:30 pm **BREAK**

12:30 pm – 1:30 pm *Legal Implications and Ethics of Trustee Communications – When Talk is NOT Cheap*
Chuck Campbell, Jackson Walker, LLP

1:30 pm **PRESENTATION OF CERTIFICATES**

GREAT LAKES ADVISORS

HISTORY, EVOLUTION & MECHANICS OF RETIREMENT PLANS

PRESENTED BY:

Kelly Weller
Managing Director, Client Service
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2019 Trustee Educational Seminar
May 18 – 19
Austin, TX



DISCUSSION TOPICS



GREAT LAKES ADVISORS
A WINDTUST WEALTH MANAGEMENT COMPANY

HISTORY, EVOLUTION & MECHANICS OF DEFINED BENEFIT PLANS

This session, designed for new trustees, provides a brief history of welfare, pension and insurance plans and their evolution into the annuity and retirement plan structures of today. In addition, the session will seek to provide a basic understanding of the terminology, mechanics and legal framework applicable to retirement plan structures.



THE PROMISE



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SOCIAL PROMISE

- Society commits to providing poverty protection to workers who are no longer able to work due to age or disability.

CAREER PROMISE

- Employees commit to working for an 'Entity' during their working career, the 'Entity' agrees to provide life time **deferred earnings** for when they can no longer work.

PUBLIC SAFETY PROMISE

- Public Safety Officers agree to sacrifice their lives and/or well being to protect the Community they serve; in turn the community agrees to protect them, as well as their families, from the risks associated with this commitment.

WHAT PROMISE?

- Globalization has virtually eliminated the '**Job for Life**' from the private sector
- Mobile work force has created the desire for '**Portability**'
 - The U.S. Bureau of Labor Statistics reports average employee tenure is **4.6 years** ⁽²⁰¹⁴⁾
- '**Pay Me Now**' A mentality that we are better educated and more financially savvy than previous generations
- Political shift to an '**Ownership Society**' where individuals are expected to bear greater risk and responsibility for their health and retirement costs



Sources: The History of Retirement Benefits: James Tehrani - June 21, 2016,

HISTORY



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WORLD HISTORY

Antiquity

- Pensions, in the broadest sense of the term, have existed since ancient Rome; soldiers in the Roman army could earn pensions through their military service. Pensions for military service have continued to exist in one form or another in the two thousand years since.

Dark Ages

- Vagabonds and Beggars Act - Imprisoned beggars, made poverty a quasi criminal act.

Renaissance, Reformation and Enlightenment (1400 AD to 1800 AD)

- Brehon Law (Keltic)
 - Imposed, a responsibility for the 'community' to provide for the aged, blind, deaf, sick and the insane.
 - Whoever comes to your door you must feed and care for.
 - When you become old your family must provide you with one oatcake a day plus a container of sour milk. They must bathe you every 20th night and wash your head every Saturday. Seventeen sticks of firewood is the allotment for keeping you warm.
- Widows and Orphan Funds were established (Duke Earnest the Pious)
- Retirement schemes were established for **Clergy**, and later expanded to **Teachers**.
- Many aspects prevail in English Common Law today (Not-For Profits and Charities)



Sources: Wikipedia – National Public Pension Coalition (NPPC) short report, "Why Pensions Matter: The history of defined benefit pension plans in the United States of America."

HISTORY



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WORLD HISTORY

Industrial Revolution (1750 AD to 1900 AD)

- **Europe - Old Age and Disability Insurance (Otto Bismarck)**
 - Started in the 1880's in Germany and England to provide a pension (life) annuity.
 - Financed by a tax on workers.
 - Original retirement age was set at 70, and eventually lowered to 65 in 1916.
 - Average European life expectancy was 45 in 1916.

Age of Globalization

- **The National Insurance Act (Greater Europe Standard) – 1940's**
 - Abolished the 'Poor Law of 1834'
 - Current European system resembling Social Security



Sources: Wikipedia – National Public Pension Coalition (NPPC) short report, "Why Pensions Matter: The history of defined benefit pension plans in the United States of America."

HISTORY



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UNITED STATES - PUBLIC SECTOR

- **Pensions for disabled military personnel predate the signing of the Constitution** (1775).
 - If a soldier left honorably (termed severance), was killed in action or died in the service, the widow or heir(s) would receive 160 acres of land from the military reserve. Land was in abundance, but what do you do with it if you are disabled?
- **First recorded 'regular' retirement was for Civil War Veterans**
 - Established 30 years as the minimum service requirement, 75% of base pay as the standard pension, and age 64 as the mandatory retirement age.
 - Funded on a "pay-as-you-go" basis from the general revenues of the U.S. Treasury.
- **First public pensions: police officers, firefighters, and teachers**
 - New York City established the first such plan for its police officers in **1857**. Like the early military plans, the New York City police pension plan was a disability plan until a retirement feature was added in **1878**
 - **1920 Civil Service Retirement System** formed to provide retirement, disability and survivor benefits to civilian federal workers



Sources: Wikipedia – Pensions, History of Pensions, wikipedia.com – Investmentandincome.com, A History of Public Sector Pensions, R. Clark, L. Craig, & J Wilson, 2003

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HISTORY



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UNITED STATES – PRIVATE SECTOR

- **Pensions – Railroad, Banking and Public Utilities**
 - 1875 American Express Company is the first private employer to provide a “Traditional” defined benefit plan.
 - B&O Railroad in 1880 was the first to jointly finance a formal ‘Plan’ with employer and employee contributions. The railroad had been in existence for over 50 years! Other railroads shortly followed suit.
 - 1899 – There were 13 private pension plans in the U.S. (Life expectancy was approximately 49).
- **Insurance Annuities**
 - **1921 Metropolitan Life** issues the first group **annuity contract**. This contract provided the structure for pooling assets and risk under a life based annuity framework for a group of employees.
- **The Revenue Act**
 - Enacted in 1921 and clarified in 1926, the Act provided that contributions to ‘**Qualified**’ Pension Trusts would be exempt from Corporate Income Tax, and earnings and contributions would not be taxable to the beneficiaries until actually distributed.
 - All were discretionary – employers could modify, suspend or annul the pension program at any time.



Sources: Wikipedia – Pensions, History of Pensions, wikipedia.com Brittany De Lea Published March 21, 2019 Personal Finance FOX Business

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EVOLUTION



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EVOLVING LEGISLATION

- **Federal Insurance and Contribution Act (F.I.C.A.)**
 - Enacted 1935 as a payroll tax used to fund **Social Security** and **Medicare**
 - No prior mandate for retirement, disability insurance, or disability/survivor income existed.
 - **Medicaid** for people with limited income and resources offers benefits not normally covered by Medicare, including nursing home care and personal care services, enacted 1965
- **The Labor-Management Relations Act of 1947**
 - Provides fundamental guidelines for the establishment and operation of pension plans administered jointly by an employer and a union.
 - Labor unions in the 1940s became interested in pension plans and pushed to increase the benefits offered. By **1950 about 25 percent of the private sector workforce had a traditional pension. Ten years later in 1960, about half of the private sector workforce had one.**



Sources: A Timeline of the Evolution of Retirement in the United States Workplace Flexibility 2010, Georgetown University Law Center, History of the Pension Plan: Mellissa Phipps - Updated January 28, 2019

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EVOLUTION



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EVOLVING LEGISLATION

- **Employee Retirement Income and Security Act (E.R.I.S.A.)**
 - Federal Law enacted 1974, resulted from strong public opinion arising from the Studebaker Corporation's failure to pay pensions to its 7600 vested retirees.
 - Establishes minimum standards for pension plans in private industry and provides for extensive rules on the federal income tax effects of transactions associated with employee benefit plans:
 - Requiring the disclosure of financial and other information concerning the plan to beneficiaries;
 - Establishing standards of conduct for plan fiduciaries;
 - Providing for appropriate remedies and access to the federal courts.
 - Created Pension Benefit Guarantee Corporation



Sources: Wikipedia – Pensions, History of Pensions, wikipedia.com – Investmentandincome.com

EVOLUTION



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EVOLVING LEGISLATION

- **The Revenue Act of 1978**
 - Included a provision that became **Internal Revenue Code (IRC) Sec. 401(k)**, under which employees are not taxed on the portion of income they elect to receive as **deferred compensation (DC)** rather than as direct cash payments. The Revenue Act of 1978 added permanent provisions to the IRC, sanctioning the use of salary reductions as a source of plan contributions. The law went into effect on Jan. 1, 1980.
 - 1979-1982—Several companies - develop 401(k) plan proposals, many of which officially began operation in January 1982.



EVOLUTION



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EVOLVING LEGISLATION

- **Pension Protection Act**
 - Passed 2006, provided for 100% vesting of contributions in defined contribution plans
 - Established standards and requirements for defined benefit funding
 - Allows for **automatic enrollment** in Code Section 401(k) plans
- **GASB 67 & 68 Reporting Requirements**
 - Transparency of liability, expected returns, and discount rates for public sector benefit plans
 - Bankruptcy becomes a potential concern for the public sector defined benefit plan
- **The Retirement Enhancement and Savings Act (RESA) of 2019**
 - A bipartisan bill, H.R. 1007, which will provide U.S. workers increased opportunities to participate in an employer-provided retirement plan. It would remove restrictions that allow small businesses to band together in a Multiple Employer Plan so they achieve economies of scale and make it easier for employers to offer a retirement plan to workers. Ignites



Sources: Wikipedia – Pensions, History of Pensions,

EVOLUTION



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SHIFTING FROM A DEFINED BENEFIT TO A DEFINED CONTRIBUTION CULTURE

- **The three "legs" of the retirement "stool" (private savings, pensions, and Social Security) are all in dire shape.**
 - After looking at the data, the St. Louis Fed concluded: "It could be worrisome that, for many American households, the total balances of their retirement accounts may not be sufficient to ensure a solid life in retirement."
 - **Private Savings:** Only 52% of workers 55 and older were saving in a 401(k) or IRA. This means that nearly half of older Americans are barreling toward retirement with no personal savings.
 - The median 401(k) account value for an investor age 65 and older is a measly \$58,035 (Vanguard).
 - **Pensions:** The median private pension is only \$9,376 a year, according to the Pension Rights Center (2017).
 - By 1996, nearly 80 percent of large private-sector employers allowed defined benefit pension plans (*Forbes*); by 2017 that number has dropped to 20%.
 - **Social Security:** The average Social Security check is \$1,422 a month or \$17,064 a year (2018).
 - Social Security will only replace about 40% of the average worker's pre-retirement income. Most seniors, however, need roughly double that amount. Current poverty level for a two person household is **\$16, 910.**



Sources: CNBC News Bob Pisani @BobPisani Published 8:18 AM ET Mon, 1 April 2019, The Motley Fool, The Federal Register 2019 Poverty Guidelines

19-1-0024

TERMINOLOGY



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PENSION

- A sum paid to a person following a retirement from service,
- Set up by Employers, Employer Associations and Trade Unions
- Terms are pre-determined, legal and/or contractually binding
- Disability and survivor benefits are typically structured as insurance – ‘Event Based’

DEFINED BENEFIT PLAN – Created under US, 26 U.S.C. 414(i)

- Terms of the benefit are **defined** and not variable
- Structured typically in the form of a **guaranteed life annuity**
- ‘Traditional’ DB is based on salary (FAP), creditable service (accrual rate), and age factors
- **Pooled Risk**

DEFINED CONTRIBUTION PLAN

- Individual ownership, risk & ‘personal’ responsibility
- Benefits are based solely on an account balance
- **Singular Risk**



Sources: Wikipedia – Pensions, History of Pensions, wikipedia.com – Investmentandincome.com, A History of Public Sector Pensions, R. Clark, L. Craig, & J Wilson, 2003

TERMINOLOGY



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QUALIFIED PLAN

- The term qualified has special meaning regarding defined benefit plans. The IRS defines strict requirements a plan must meet in order to receive favorable tax treatment, including:
 - A plan must offer a Single Life Annuity (SLA) and a Qualified Joint & Survivor Annuity (QJSA)
 - A plan must maintain sufficient funding levels
 - A plan must be administered according to the plan document
 - Benefits are required to commence at retirement age
 - Once earned, benefits may not be forfeited
 - A plan may not discriminate in favor of highly-compensated employees
 - Failure to meet IRS requirements can lead to plan disqualification, which carries with it enormous tax consequences

NON-QUALIFIED PLANS

- 403(b) & 457 plans are not considered qualified plans, but are treated and taxed almost identically
- Tax deferred savings accounts, SEP, SIMPLE and Rabbi Trusts



MECHANICS



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INSURANCE

- A contract formed for the purpose of covering certain types of events for a related group of stakeholders.
- Insurance involves:
 - **Risk Shifting:** Risk shifting occurs if a person facing the possibility of an economic loss transfers some or all of the financial consequences of the potential loss to the insurer.
 - **Risk Distribution:** Risk distribution incorporates the statistical phenomenon known as the law of large numbers. Distributing risk allows the insurer to reduce the possibility that a single claim will exceed the amount taken in as payment.
 - **Asset Protection:** Assets are generally not subject to creditors' claims and are held in Trust.
- **Reasons to Self Insure (Public DB Plans):**
 - Lower cost
 - Obtain protection not otherwise available
 - Custom design
 - Investment potential of reserve
 - Control of the claims process



MECHANICS



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MECHANICS

- Retirement schemes are structured around four macro design choices:
 - Payroll Taxes (Employer & Employee)
 - Tax Deferred Earnings (Employer & Employee)
 - Tax Advantaged Savings (Individual)
 - Private Savings (Individual)

RETIREMENT SHOULD BE FINANCED BY A COMBINATION OF THE ABOVE

- To achieve this, the employee needs career long earnings deferral and savings
 - Retirement experts recommend an 83% wage replacement rate for an equivalent standard of living
 - 125% wage replacement rate, if retiree will be without access to employer subsidized health care



MECHANICS



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PAYROLL TAXES

Social Security

- Goal – **Poverty Protection & Living Wage Replacement**
 - Guaranteed Life Annuity

TAX DEFERRED EARNINGS (PAYROLL)

Traditional Defined Benefit Plan

- Employer Sponsored
- Deferred Current Income
- Income Tax Deferred
- Pooled Assets and Risk Distribution
- Dynamic Funding Requirements
- Goal – **Wage Replacement**
 - Typically a Guaranteed Life Annuity



MECHANICS



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TAX DEFERRED EARNINGS (PAYROLL)

Typical Defined Contribution Plan - 401(k)

- Employer Sponsored
- Deferred Current Income
- Income Tax Deferred
- Defined Contribution Rate
- Self Directed Investments - **Risk shifts to the employee**
- Ownership/Control
- Goal:
 - **Wage Replacement**
 - **Portability**
 - **Flexibility** - Hardship & Loans
 - **Sufficient Rate of Return**
- No defined dollar amount or annual benefit structure
 - Available amount is solely based on the account balance



MECHANICS



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TAX DEFERRED EARNINGS (PAYROLL)

Tax Deferred Non Qualified Plans: 457 & 403(b)

- Employer Sponsored
- Deferred Current Income
- Income Tax Deferred
- Goal:
 - **Wage Replacement - Supplement to a Traditional Pension**
 - Competitive rate of return
 - Wealth Accumulation and Inheritance

TAX ADVANTAGED SAVINGS

IRA (Roth & Traditional)

- Income Tax Advantages with Deferred or Waived Tax on Investment Earnings



BIOGRAPHY



Kelly Weller

Managing Director

Kelly Weller is a Managing Director of Client Service and Sales for Great Lakes Advisors and serves as a client relationship manager for the firm. Kelly began his industry career in 1994 and specializes in investment solutions for public, non-profit, corporate, and multi-employer endowment, foundation and retirement plans.

Prior to joining the firm in 2012, he held similar positions with PNC Capital Advisors, LLC and JP Morgan Asset Management Company. As a former firefighter, public fund trustee and current Board Advisor to the National Conference on Public Employee Retirement Systems, Kelly brings a deep relationship network and practical experience to the client service team.

Kelly holds a bachelor's degree from Illinois College, an MBA from the University of Illinois (Springfield), and is also a Certified Public Accountant. He also holds FINRA Series 7, 63, and 65 Licenses.

ABOUT GREAT LAKES ADVISORS

Founded in 1981, Great Lakes Advisors is headquartered in Chicago, Illinois with an additional office in Tampa, Florida. The firm has \$9.3 billion in assets under management and advisement and offers a wide range of fixed income and equity strategies across all market capitalizations. We have deep portfolio management capabilities within ESG, Socially Responsible, Tax-Managed, and Customized account solutions. Our clients include public funds, multi-employer plans, corporations, religious communities, endowments/foundations, health care plans, and private wealth management clients. Great Lakes Advisors certifies compliance with the NCPERS Code of Conduct.



DISCLOSURES



GREAT LAKES ADVISORS
A WINTRUST WEALTH MANAGEMENT COMPANY

Sources:

- Wikipedia – Pensions, History of Pensions, wikipedia.com – Investmentandincome.com, A History of Public Sector Pensions, R. Clark, L. Craig, & J Wilson, 2003, Monthly Labor Review 2012
- ¹Retirement benefits: Access, private industry workers, National Compensation Survey, March 2015, Wall Street Journal: The Champions of the 401(k) Lament the Revolution They Started (Markets)
- Rev. Rul. 2002-90, 2002-2 C.B. 985
- National Conference on Public Employee Retirement Systems, “ The Evolution of Public Pension Plans”
- National Public Pension Coalition (NPPC) short report, “Why Pensions Matter: The history of defined benefit pension plans in the United States of America.”
- The History of Retirement Benefits: James Tehrani - June 21, 2016
- A Timeline of the Evolution of Retirement in the United States Workplace Flexibility 2010, Georgetown University Law Center
- History of the Pension Plan: Mellissa Phipps - Updated January 28, 2019
- The Motley Fool
- A Timeline of the Evolution of Retirement in the United States Workplace Flexibility 2010, Georgetown University Law Center
- Ignites
- CNBC News Bob Pisani @BobPisani Published 8:18 AM ET Mon, 1 April 2019
- Brittany De Lea Published March 21, 2019 Personal Finance FOX Business
- The Federal Register 2019 Poverty Guidelines

Great Lakes Advisors, LLC (“Great Lakes” or “GLA”) is an investment advisor registered with the Securities and Exchange Commission under the Investment Advisors Act of 1940. Established in 1981, Great Lakes is a subsidiary of Wintrust Financial Corporation and a part of the Wintrust Wealth Management family of companies. On October 1, 2013, majority owned subsidiary Advanced Investment Partners, LLC (“AIP”) became fully-owned and integrated into Great Lakes. Great Lakes is a distinct business unit with distinct investment processes and procedures relating to the management and/or trading of investment portfolios for its clients.

Great Lakes Advisors, LLC claims compliance with the Global Investment Performance Standards (GIPS®). A complete list of firm composites and performance results, and the policies for valuing portfolios, calculating performance, and preparing GIPS compliant presentations are available upon request by calling 312-553-3700.





2019

Trustee Educational Seminar

Fund Structure

So, you're a new Trustee....now what?

Jennifer Mink

Senior Consultant | Senior Partner
Investment Performance Services
Philadelphia, PA



Fiduciary

- A person who holds a legal or ethical *relationship of trust* with one or more other parties.
- A Fund Trustee *prudently* exercises discretionary authority or control over management of the plan or disposition of assets.
- Fiduciary duty is the *highest standard of care* in law.

Prudent Person Rule

Helps guide fiduciaries when making investment decisions.

A fiduciary entrusted with funds for investment may invest in securities that any *reasonable individual acting in like capacity and familiar with such matters* would purchase in the interest in receiving a good return of income while preserving capital.

Fiduciary Responsibility

A fiduciary demonstrates prudence by the process through which investment decisions are managed.



FOLLOW
THE YELLOW BRICK ROAD

Investment **P**olicy

Asset **A**llocation

Performance **M**easurement



Policy



- Define Roles and Responsibilities
- State Goals and Objectives
- Identify Investments –Allowed and Restricted

The Decision Makers

- Trustees
- Investment managers
- Custody bank
- Advisory professionals
 - Actuary
 - Counsel
 - Investment Consultant
 - Chief Investment Officer



Objectives

- Investment goal
- Time horizon
- Risk tolerance
- Liquidity



Guideline Requirements

- Permissible assets
- Quality standards
- Diversification
- Restricted assets



Asset Allocation



- Targets
- Ranges
- Rebalancing Strategy

Why the road matters...

Policy Targets		
Asset Class	Target	Range
Domestic Large Cap Equity	35%	30- 40%
Domestic Small Cap Equity	10%	5 -15%
Investment Grade Fixed Income	35%	30 -40%
High Yield Fixed Income	10%	5 -15%
Real Estate	10%	5 -10%
Cash Equivalents	Minimal	

December 31, 2008

Policy Targets		
Asset Class	Target	Range
Domestic Large Cap Equity	15%	30- 40%
Domestic Small Cap Equity	0%	NA
Investment Grade Fixed Income	65%	60 -70%
High Yield Fixed Income	10%	5 -15%
Real Estate	10%	5 -10%
Cash Equivalents	Minimal	

March 4, 2009

Policy Targets		
Asset Class	Target	Range
Domestic Large Cap Equity	55%	50 -65%
Domestic Small Cap Equity	0%	NA
Investment Grade Fixed Income	35%	30 -40%
High Yield Fixed Income	15%	10 -20%
Real Estate	0%	NA
Cash Equivalents	Minimal	

November 30, 2009

Impact of going “off road”



Calendar Year Returns

Calendar Year Ending December 31

Total Fund Returns	2009	2010
	%	%
“Market Timing Client”	-1.2%	9.9%
Median DB return	13.4%	12.8%
Top Quartile DB return	17.5%	14.2%
Index Returns		
Barclays Aggregate Index	5.9%	6.5%
S&P 500 Index	26.4%	15.1%
NCREIF NFI-ODCE Index	-29.8%	16.4%

The Importance of Rebalancing!

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
EM Equity 25.6%	EM Equity 34.0%	EM Equity 32.2%	EM Equity 39.4%	Fx Inc 5.2%	EM Equity 78.5%	Small Cap 26.9%	RE 16.0%	EM Equity 18.2%	Small Cap 38.8%	Large Cap 13.7%	RE 15.2%	Small Cap 21.3%	EM 37.3%	RE 8.2%
Mid Cap 20.2%	RE 21.4%	Int'l 26.3%	RE 16.0%	RE -10.0%	HY 57.5%	Mid Cap 25.5%	Fx Inc 7.8%	Int'l 17.3%	Mid Cap 14.8%	Mid Cap 13.2%	Large Cap 1.4%	RE 17.1%	Int'l 25.0%	SD HY 1.4%
Int'l 20.2%	Int'l 13.5%	Small Cap 18.4%	Int'l 11.2%	SD HY 14.0%	Mid Cap 40.5%	EM Equity 18.9%	HY 4.4%	Mid Cap 17.3%	Large Cap 32.4%	RE 12.5%	SD HY 1.2%	Mid Cap 13.8%	Large Cap 21.8%	Fx Inc 0.0%
Small Cap 18.3%	Mid Cap 12.6%	RE 16.3%	HFOF 10.3%	HFOF -21.4%	SD HY 36.1%	RE 16.4%	SD HY 4.4%	Small Cap 16.3%	Int'l 22.8%	Fx Inc 6.0%	Fx Inc 0.6%	Large Cap 12.0%	Mid Cap 18.5%	HY -2.3%
GTAA 13.2%	HFOF 7.5%	Large Cap 15.8%	GTAA 9.9%	GTAA -25.4%	Int'l 31.8%	HY 15.2%	Large Cap 2.1%	Large Cap 16.1%	GTAA 15.3%	Small Cap 4.5%	HFOF -0.3%	EM 11.2%	GTAA 17.1%	HFOF -3.9%
RE 13.0%	Large Cap 4.9%	Mid Cap 15.3%	Fx Inc 7.0%	HY -26.4%	Small Cap 27.2%	Large Cap 15.1%	GTAA -0.9%	HY 15.6%	RE 14.0%	HFOF 3.4%	Int'l -0.8%	RE 9.3%	Small Cap 14.7%	Large Cap -4.4%
Large Cap 10.9%	Small Cap 4.6%	GTAA 15.1%	Mid Cap 5.6%	Small Cap -33.8%	Large Cap 26.5%	SD HY 11.7%	Mid Cap -1.7%	RE 10.9%	HFOF 9.0%	GTAA 3.0%	GTAA -1.6%	SD HY 8.5%	HFOF 7.8%	GTAA -5.7%
HY 10.8%	GTAA 3.6%	HY 11.7%	Large Cap 5.5%	Large Cap -37.0%	GTAA 20.1%	GTAA 9.8%	Small Cap -4.2%	GTAA 10.9%	HY 7.4%	HY 2.5%	Mid Cap -2.2%	GTAA 5.6%	RE 7.8%	Mid Cap -1.1%
HFOF 6.9%	HY 2.7%	HFOF 10.4%	SD HY 3.9%	Mid Cap -41.5%	HFOF 11.5%	Int'l 7.8%	RE -5.7%	SD HY 10.2%	SD HY 5.6%	SD HY 1.9%	Small Cap -4.4%	Fx Inc 2.7%	HY 7.5%	Small Cap -11.0%
Fx Inc 4.3%	Fx Inc 2.4%	SD HY 9.9%	HY 2.2%	Int'l -43.4%	Fx Inc 5.9%	Fx Inc 6.5%	Int'l -12.1%	HFOF 4.8%	Fx Inc -2.0%	EM Equity -2.2%	RE -4.6%	Int'l 1.0%	SD HY 3.6%	Int'l -13.8%
	SD HY 2.4%	Fx Inc 4.3%	Small Cap -1.6%	EM Equity -53.3%	RE -29.8%	HFOF 5.7%	EM Equity -18.4%	Fx Inc 4.2%	EM Equity -2.6%	Int'l -4.9%	EM Equity -14.9%	HFOF 0.5%	Fx Inc 3.5%	EM -14.6%

*Large Cap Equity = S&P 500 Index
 *Mid Cap Equity = Russell Midcap Index
 *Small Cap Equity = Russell 2000 Index
 *International Equity = MSCI EAFE Index
 *Emerging Markets = MSCI EM Index

*Fixed Income = Barclays Aggregate Index
 *High Yield = Merrill Lynch High Yield Master II Index
 *Real Estate = NCREIF ODCE Index
 *Hedge Fund of Funds = HFRI ROF Index
 *Global Tactical Asset Allocation = 65%MSCI World Equity/35% Citi World Gov't Bond Index
 *Short Duration High Yield = ML High Yield Cash Pay 1-3 Yr BB Index. Index inception date was January 1, 2005.

Measurement



- Total Fund
- Investment Managers
- Compliance

Program Evaluation

- Performance
 - Total Fund
 - Relative to actuarial assumption
- Peer universe ranking
 - Median or above

Other important factors to consider...

- Growth of assets
- Liquidity needs are met
- Compliance with investment policy



Public Funds Defined Benefit Universe

As of December 31, 2018

Rank	1 yr	3 yrs	5 yrs	10 yrs	2018	2017	2016	2015	2014
5th Percentile	-1.3%	7.3%	5.8%	9.7%	-1.3%	18.2%	9.4%	2.2%	8.0%
25th Percentile	-3.1%	6.4%	5.2%	8.9%	-3.1%	16.5%	8.4%	0.9%	6.8%
Median	-4.0%	6.0%	4.8%	7.3%	-4.0%	15.3%	7.7%	0.1%	5.8%
75th Percentile	-4.9%	5.5%	4.3%	6.7%	-4.9%	14.0%	6.9%	-0.9%	4.6%
95th Percentile	-6.3%	4.7%	3.4%	5.6%	-6.3%	11.3%	5.3%	-2.6%	3.2%

Manager Evaluation



- **Performance**

- Absolute & Relative to index; consistency; NOF

- **Peer universe ranking**

- Median or above

- **Risk statistics**

- Standard deviation, capture ratios, tracking error

- **Style drift**

- Portfolio holdings attribution

- **Firm stability**

- Ownership, insurance, regulatory, investment team

- **Compliance with investment policy**

- Consistency; communication

Manager Compliance

- Permissible assets
- Communication & reporting
- Proxy voting
- Trading costs
- Commingled fund guidelines
- Liquidity



Who monitors?

What you need to succeed...



- Know your role
- Work with experienced professionals
- Organize: Clearly define your investment policy
- Implement: Establish asset allocation & hire managers
- Monitor: Measure your performance & monitor the program
- Know what is going on...get educated!
 - Attend meetings /read minutes
 - Go to conferences
 - Ask questions



**KEEP
CALM
AND FOLLOW
THE YELLOW
BRICK ROAD**



2019

Trustee Educational Seminar

Thank you!

Jennifer Mink

Senior Consultant | Senior Partner

Investment Performance Services

jmink@ips-net.com



**INVESTMENTS 101: FIXED
INCOME & PUBLIC EQUITIES**
TRUSTEE EDUCATION SEMINAR



May 18, 2019

Doug Moseley, Partner



BOSTON | ATLANTA | CHARLOTTE | CHICAGO | DETROIT | LAS VEGAS | PORTLAND | SAN FRANCISCO

BASIC CONCEPTS

NEPC, LLC

WHAT IS AN ASSET?

- **What is an asset?**

- A resource with economic value that a corporation or investor owns or controls expecting that it will provide benefits in the future.
- Ownership stake or listed security
- Can be a right or claim on future cash flow

- **What is an asset class?**

- A group of securities that have similar characteristics, act similarly and are subject to the same regulations.
- Each asset class reflects different risk and return characteristics and perform differently under various market environments.
- Assets can be broken down further within Traditional asset classes and Alternative asset classes.



TRADITIONAL ASSETS VS. ALTERNATIVE ASSETS

Traditional Assets	Alternative Assets
<ul style="list-style-type: none">• Equity (Stocks)• Fixed Income (Bonds)• Public Real Estate (REITs)• Commodities• TIPS	<ul style="list-style-type: none">• Private Equity• Private Debt• Private Real Estate• Real Assets• Hedge Funds• Global Asset Allocation & Risk Parity

TRADITIONAL INVESTMENTS OVERVIEW

NEPC, LLC

WHY INVEST IN TRADITIONAL ASSETS?

Diversification:

- A mix of equity and fixed income strategies can provide diversification benefits to a total portfolio through low correlations to each other

Liquidity:

- Traditional assets are generally more liquid than alternative assets, resulting in clients being able to access their capital as needed (daily or monthly basis)

Risk-adjusted returns:

- May provide investors with better risk-adjusted returns and a “smoother ride” through historically lower volatility and smaller drawdowns relative to other risk assets

**Past performance is no guarantee of future results*



EQUITY VERSUS FIXED INCOME

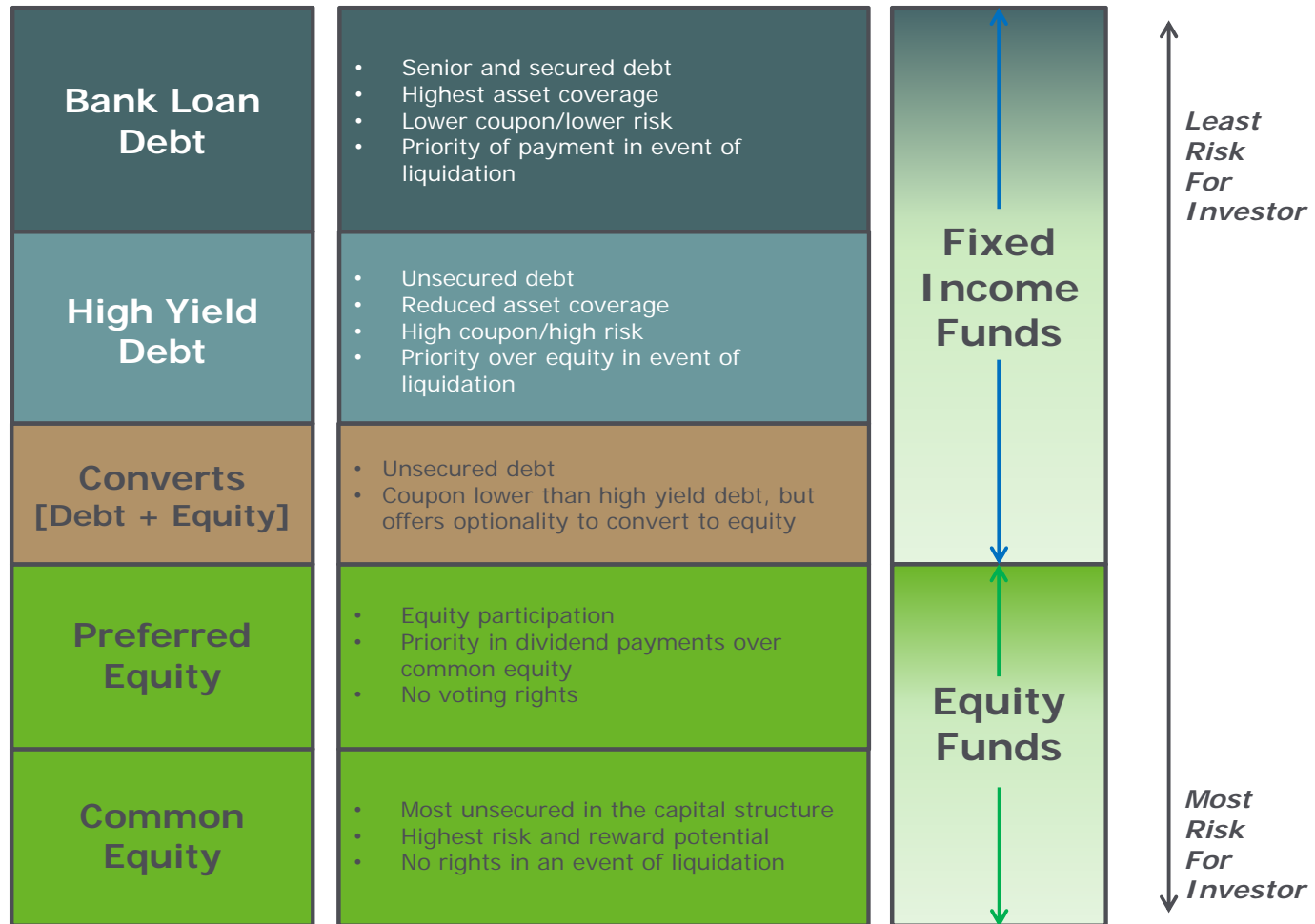
Equity

- **Investor = Owner**
 - Own all or part of the entity
- **Residual claim on earnings**
 - Dividends
 - Price appreciation
- **Price changes**
 - Expected earnings
 - Macro factors
 - Company factors

Fixed Income

- **Investor = Lender/Creditor**
 - Loan the entity money
- **Owed interest & principal**
 - Regular interest payments (yield)
 - Zero coupon (interest and principal at maturity)
- **Price Changes**
 - Interest rate change
 - Spread (over Treasury rate) change
 - Credit quality change
 - Estimate probability of
 1. Default
 2. Recovery

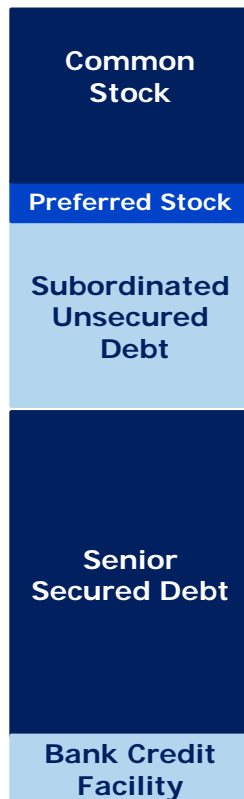
CORPORATE BALANCE SHEET & CAPITAL STRUCTURE



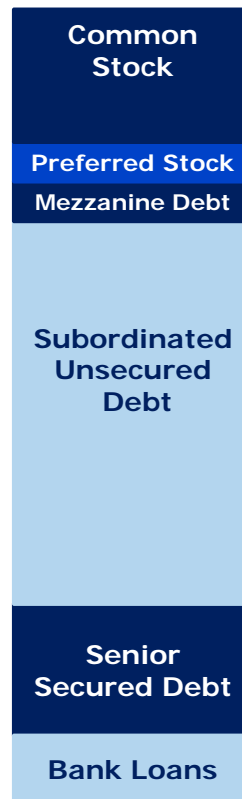
CORPORATE CAPITAL STRUCTURE: DEBT VS. EQUITY

Investors are compensated based on the risks they are assuming in the capital structure. Capital structures vary based on many factors.

Inv. Grade Co.



High Yield Co.



- Claim on residual cash flows
- Higher Risk
- Higher Expected Return

- Priority claim on the Cash flows
- Lower Risk
- Lower Expected Return

FIXED INCOME

NEPC, LLC

REFRESHER ON KEY FIXED INCOME MARKET TERMINOLOGY

- **Definitions**

- Coupon: the interest rate state on a bond when it's issued and paid on a regular basis
- Principal: the original sum of money invested or lent, face value of bond
- Yield: the income return on investment which refers to the interest paid relative to the current price of the security
- Spread: Refers to the excess or incremental yield over the equivalent government bond (which represents the lowest risk alternative)
- Maturity: refers to a finite time period at the end of which the financial instrument will cease to exist and the principal is repaid with interest
- Duration: the weighted average term-to-maturity of a bonds cash flows. Also used as a measure of the sensitivity of the price of fixed income investment to a change in interest rates. Duration is typically expressed as a number of years.
- Rating: Method of evaluating the possibility of default by a bond issuer. Standard & Poor, Moody's and Fitch are rating agencies that analyze the financial strength of each bond issuer and assign ratings that range from - AAA (highly unlikely to default) to D (in default)
 - Investment Grade – bonds rated AAA, AA, A and BBB
 - High Yield – bonds rated BB, B, CCC, CC, C and D



TYPES OF BONDS – DIFFERENT ISSUERS AND STRUCTURES

- **Government or Sovereign debt**
 - Debt issued by a national government and denominated in a local or foreign currency
 - US Treasury Bonds
 - Guaranteed by the full faith and credit of the US government
 - **Treasury Bills** – mature in one year or less
 - **Treasury Notes** – mature in 1-7 years
 - **Treasury Bonds** – mature in over 7 years
 - **Treasury Inflation Protected Securities (TIPS)** – various maturities with principal adjusted annually for inflation
- **Quasi-Sovereign (Agency) debt**
 - Debt with explicit or implicit government guarantees (ex: Ginnie Mae)
- **Corporate Bonds (US, Foreign, Emerging)**
 - Can be secured or unsecured
 - Issued by companies of varying size & credit-quality
- **Mortgage debt**
 - A bond secured by a mortgage on a property, typically residential or commercial real estate.
 - Issued by government agencies like Fannie Mae & Freddie Mac, as well as banks and mortgage companies
- **Asset-backed Securities (ABS)**
 - Bonds that are secured by secured and unsecured claims on property or cash flows
 - Auto loans, credit cards
- **Structured debt**
 - Broader term that reflects fixed income securities structured with multiple layers or tranches



CONSIDERATIONS FOR FIXED INCOME INVESTORS

- **Fixed investors must decide the following when evaluating their portfolio and individual investment:**
 - **In which markets to invest?**
 - US vs. non-US
 - Public vs. private markets
 - **What sectors & security types to consider?**
 - Government vs. corporate vs. mortgage or ABS securities
 - **Level of credit risk they are willing to assume?**
 - Investment grade vs. High Yield
 - Maximum exposure to one issue or issuer
 - **Level of liquidity risk they are willing to assume?**
 - Large markets vs. niche markets or sectors
 - Large issuers vs. smaller issuers
 - **Currency risk they are willing to assume?**
 - Should the currency risk be avoided or hedged?



WHAT ARE THE MAIN RETURN DRIVERS FOR FIXED INCOME?

- **Fixed Income returns can be deconstructed into sub-sector building blocks or risk premia**
- **Cash**
 - Can be subdivided into both real risk-free rate and inflation
- **Term or Duration Premium**
 - Income earned by an investor in excess of cash
 - Represents the premium for lending your cash over a maturity period
- **Credit Spread**
 - Income earned by an investor in excess of cash and the term/duration premium
 - Represents the return premium for assuming issuer default risk
- **Changes in market Interest Rates**
 - Price change of a bond due to the change in interest rates
 - Represents a valuation input as current interest rates incorporates expectations of interest rate changes (forward rates) relative to economic conditions
- **Illiquidity**
 - Return associated with an illiquidity factor specific to fixed income
 - Requires a contractual lock on liquidity, generally over a 3 to 7 year period



PRIMARY RISKS ASSOCIATED WITH FIXED INCOME INVESTING

- **Interest-Rate Risk:**
 - Primary market risk assumed by fixed income investor
 - Risk that the price of a bond will fluctuate due to change in market interest rates
 - Bond prices move in the opposite direction of interest rate
 - Interest rate risk is typically expressed as duration
- **Default/Credit Risk:**
 - Defined as the risk of an entity being unable to make the required payments on their debt obligations
 - To help mitigate the impact of default/credit risk, lenders often charge rates of return that correspond with the borrowers level of default risk
 - i.e. The higher the perceived default/credit risk, the higher the rate of interest that investors will demand for lending their capital with a high Default risk should be a concern for below investment grade bonds
 - Default risk evaluated based on stability of cash flows, level of asset protection
- **Liquidity Risk:**
 - Defined as the risk of being unable to buy or sell an investment quickly enough to prevent or minimize a loss
 - Liquidity risk is minimal for govt. debt however
 - Liquidity risk is a concern for lower rated bonds, securities that were part of a small issue, or bonds that have recently had their credit rating downgraded
- **Other risks include reinvestment & currency risk**



HISTORICAL CORPORATE YIELD SPREADS – LEVEL OF COMPENSATION FOR TAKING CREDIT RISK

15-Year History of Credit Spreads By Rating *(in bps as of 12/31/18)*

(100 bps = 1.0%)

	12/31/2018	12/29/2017	15 YR LOW	15 YR HIGH	15 YR AVERAGE
US Corp IG	153	93	77	607	157
Aaa	78	53	46	412	82
Aa	83	49	41	483	103
A	120	73	58	588	138
Baa	192	121	106	732	198
US Corp HY	526	343	238	1833	521
Ba	354	211	151	1278	365
B	531	343	228	1742	500
Caa	989	615	378	2606	833

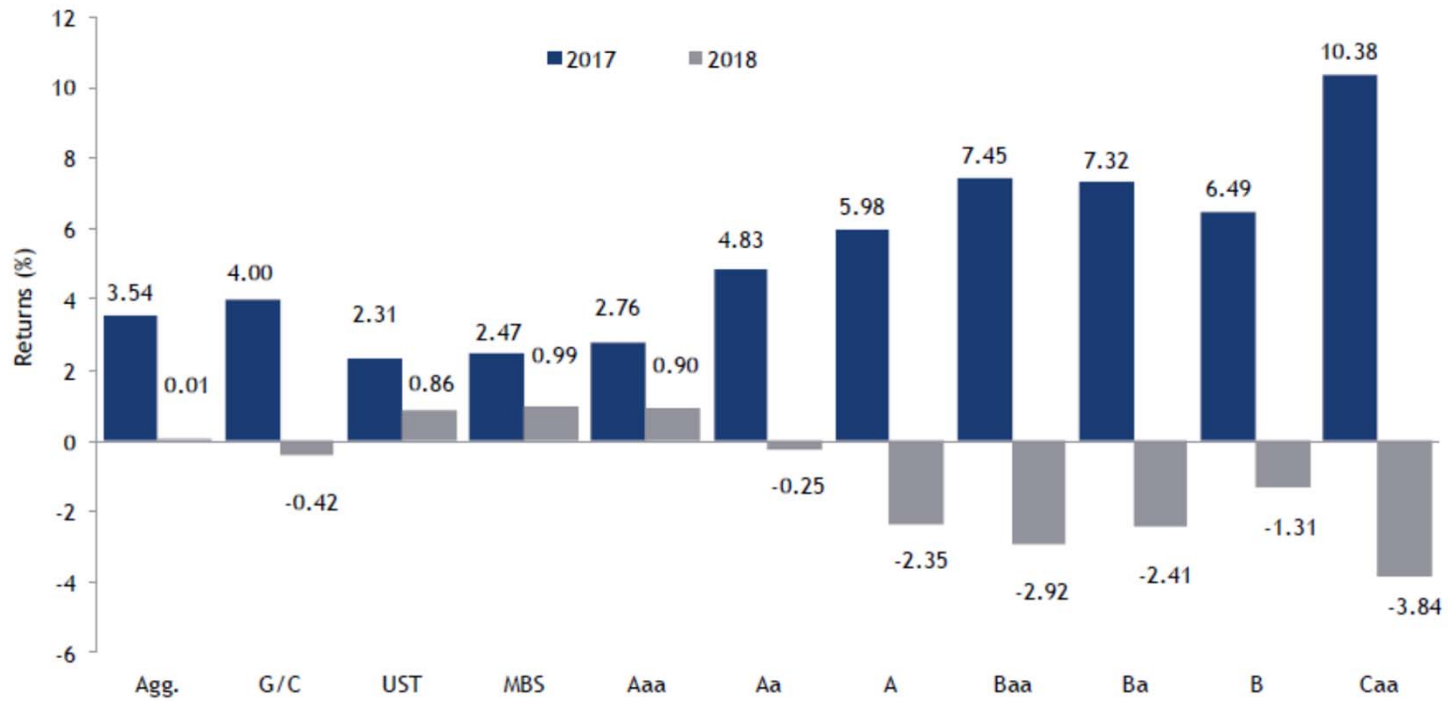


Source: Barclays Capital and Loomis Sayles

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RECENT RETURN COMPARISON – CREDIT QUALITY MATTERS

US Market Returns by Credit Quality (2017 vs. 2018)

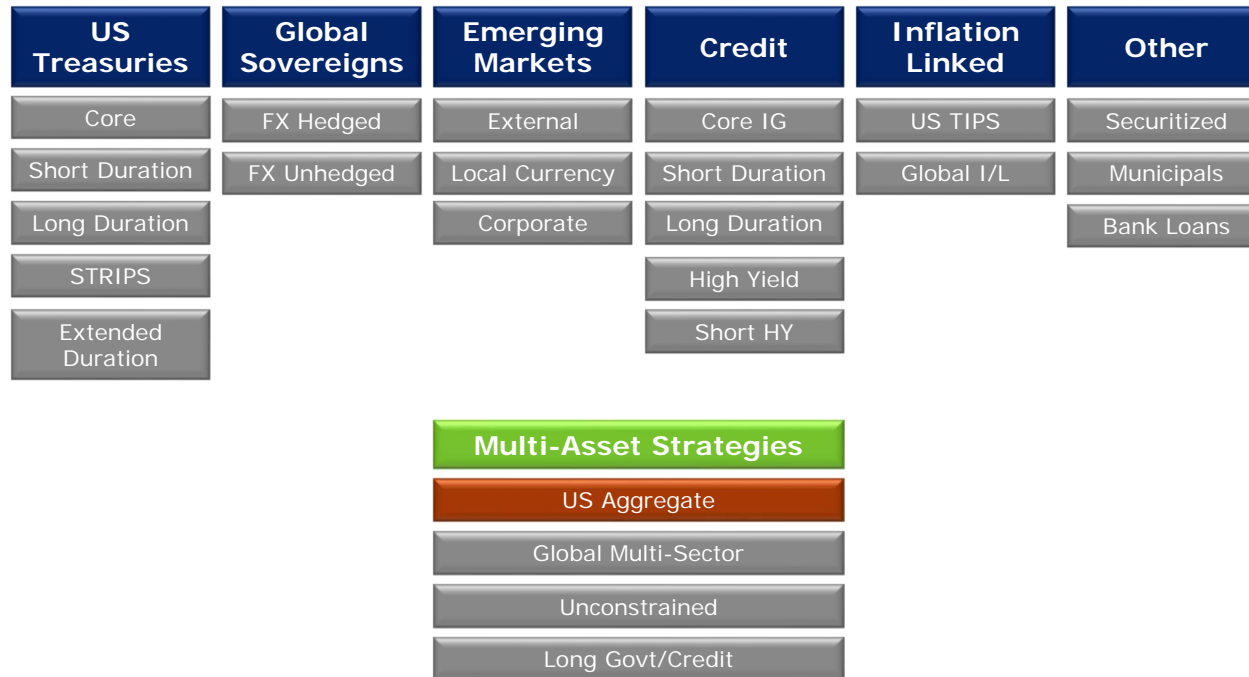


Source: Barclays Capital and Loomis Sayles

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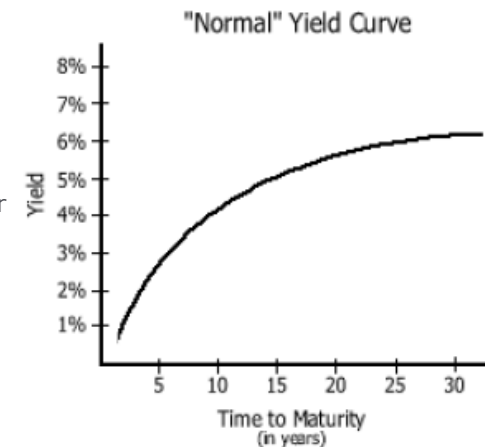
HOW DO WE INVEST IN FIXED INCOME?

- **Fixed income markets offer distinct sub-sectors to invest across a broad risk spectrum including various maturities and geography**
 - Indices often constructed based on size: Largest debtors generally represent the biggest share of an index



CORE & CORE PLUS FIXED INCOME

- **“Multi-Sector” bond portfolio that is generally benchmarked to the Bloomberg Barclays Aggregate Index**
 - Government bonds, corporate bonds, mortgage bonds, and other fixed income investments
 - Typically, AAA to BBB rated
 - “Core-Plus” – includes BB or lower; but average rating is “investment grade”
- **Why include in a portfolio**
 - Stabilizes portfolio returns
 - Low correlation to equities (diversification benefits)
 - A core holding in almost all institutional portfolios
- **Managers add value by focusing on**
 - Interest rate moves (Duration positioning)
 - Yield curve positioning
 - Traces yield on securities with varying maturities
 - Under “normal” conditions, long term rates should be greater than short term rates (upward sloping)
 - Inverted yield curve has short term rates greater than long term rates; considered a predictor of a recession.
 - Sector rotation
 - Issue selection: Credit research (avoiding defaults)



HIGH YIELD BONDS

- **Description**
 - Corporate bonds with credit ratings of less than BBB
 - AKA, “junk bonds”
 - Higher yields, higher default risk, lower financial stability, and/or more debt
 - Portfolios are diversified to limit default risk of a single issuer
- **Why include in a portfolio**
 - Attractive coupon yields
 - Good risk-adjusted returns
 - Diversification benefits
- **Managers add value by**
 - Credit analysis
 - Avoiding down grades and defaults
 - Identifying bonds poised for credit rating upgrade
 - Lowers spread to Treasuries and thus increases return



FOREIGN/GLOBAL BONDS

- **Description**

- Dollar and Non-dollar fixed income securities issued by:
 - Foreign Governments – Sovereigns (decreasing percentage)
 - Supranationals (e.g. World Bank, IMF)
 - Foreign Companies (increasing percentage)
 - Mortgage-backed securities (occasionally)
- Global portfolios include US securities

- **Why include in a portfolio**

- Diversification
- World's largest investable asset class
- Foreign/Global portfolios look different from domestic portfolios
 - Currency fluctuations, out of synch world markets, interest rate fluctuation by region, etc..

- **Managers add value by**

- Same factors as US fixed income, and
- Country/region selection
- Currency management



INFLATION-LINKED BONDS

- **TIPS: Treasury Inflation Protection Securities**

- Description
 - Issued by the US Treasury
 - Designed to provide investors with a real rate of return and compensation for potentially rising inflation over the life of the security
- Why include in a portfolio
 - Provides inflation protection, as measured by CPI, through adjustment in principal
 - The real rate component of TIPS' return will move counter-cyclically with the economy, thereby providing a hedge to credit and equity market risks.
- Managers add value by
 - Using multiple valuation factors such as inflation outlook, level of real rates, and seasonal factors to identify undervalued securities.

- **Other**

- Global Inflation-Linked: A portfolio primarily of global inflation-indexed securities.



EMERGING MARKET BONDS

- **Description**

- Debt issued by emerging market countries (Mexico, Brazil, Russia) and companies
 - External debt – issued in USD or Euros
 - Local debt – issued in local currency of the issuer
 - Local debt markets far exceeds the external debt markets

- **Why include in a portfolio**

- Higher expected return over time
- Diversification benefit derived from lower correlation to developed fixed income markets
- Non-dollar exposure can protect against potential declines in the US dollar
- Strong growth and improving stability
 - Lower levels of consumer and govt. debt, high savings rates, capacity economic growth
 - Capital inflows into EM countries continue to be strong
 - Emerging markets contributing an increasing share of Global GDP

- **Managers add value by**

- Same as US and Foreign
- Increased focus on inflationary environment and outlook
- Evaluate political risks



FIXED INCOME DERIVATIVES – TOOLS

- **Credit Default Swaps (CDS)**
 - Buy or Sell Credit Exposure on Market, Sectors or Issues
 - Can be an efficient tool to increase or decrease credit exposure
- **Interest Rate Futures**
 - Buy or Sell Interest Rate Exposure
 - Can be an efficient tool to increase or decrease interest rate exposure
- **Other (Options, Swaps, Forward Contracts, etc.)**

Definition: A security whose price is dependent upon or derived from one or more underlying assets. The derivative itself is merely a contract between two or more parties. Its value is determined by fluctuations in the underlying asset. The most common underlying assets include stocks, bonds, commodities, currencies, interest rates and market indexes. Most derivatives are characterized by high leverage. (Investopedia)

Note about “high leverage”: A large “notional” exposure is achieved with little or no initial investment. Leverage does not exist if the difference (between the small/no investment and the “notional” exposure) is fully collateralized.

Example: \$1,000,000 Futures contract
Required investment: \$100,000 (high leverage = 10X)
Cash Collateral: \$1,000,000 (no leverage)



EQUITY

NEPC, LLC

EQUITY OVERVIEW AND KEY TERMINOLOGY

“Shares in the ownership of a company’s assets and earnings.”

* * * * *

- **Capitalization:**

- *Price of a company’s stock X number of shares outstanding*
 - Large Cap: *Range from \$10-300 B (ex: Apple Inc.)*
 - Mid Cap: *Range from \$2-10 B (ex: MGM Resorts International)*
 - Small Cap: *Range usually below \$2 B (ex: Weight Watchers Int’l)*

- **Style:**

- *Based on the underlying fundamentals of the company*
 - Value: *Low price to earnings ratio, low price to book ratio, high dividend yield, lower earnings growth*
 - Growth: *High price to earnings ratio, high price to book ratio, low dividend yield, higher earnings growth*

- **Domicile:**

- *Country of Origin*
 - *Domestic (US)*
 - *International Developed (Japan, UK, Germany) ex: Sony Corp.*
 - *International Emerging (Mexico, Russia, China) ex: TV AZTECA*
 - *Frontier (Vietnam, Colombia) ex: Bancolombia SA*



WHAT ARE THE MAIN RETURN DRIVERS FOR EQUITIES?

- **Equities represent the residual ownership claim on corporate earnings**
- **Equity returns are highly cyclical as both earnings and valuation changes influence stock price movements**
 - Equity returns can be deconstructed into sub-sector building blocks or risk premia
- **Dividend Yield**
 - Divided income paid in excess of retained earnings to a stockholder
 - Dividends have historically been a large source of returns but declined in last 40 years
- **Valuation**
 - Represented by the P/E ratio or the price investors are willing to pay for earnings
 - P/E is highly cyclical in nature and influenced by investor risk appetite
- **Real Earnings Growth**
 - Growth of corporate earnings in excess of inflation
 - Earnings influenced both by changes in profit margins and economic growth cycles
- **Illiquidity**
 - Return associated with an illiquidity factor specific to equity
 - Requires a contractual lock on liquidity, generally over a 7 to 10 year period

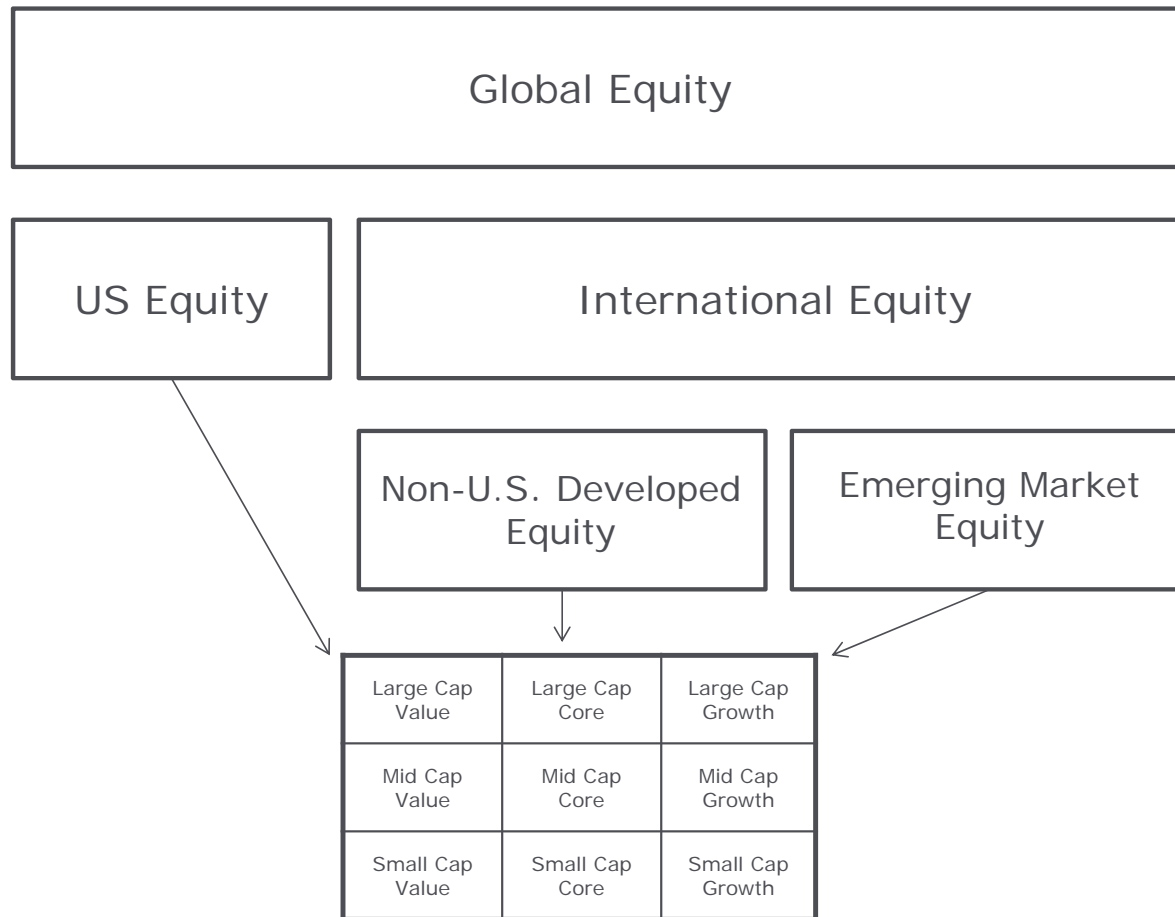


PRIMARY RISKS ASSOCIATED WITH EQUITY INVESTING

- **Earnings Growth & Variability:**
 - Primary earnings drivers are revenue growth & profitability
 - Stock price driven by future expectations for growth & profitability
- **Product obsolescence and competition**
 - Risk that customers no longer want to pay for product offerings
- **Liquidity Risk:**
 - Defined as the risk of being unable to buy or sell an investment in the desired time period
 - Investors generally willing to accept a lower return for higher liquidity (and demand higher return for lower liquidity)
- **Currency Risk:**
 - Risk that currency that a stock is denominated in changes in value relative to the investors home or “base” currency (= US Dollar for US investors)
 - Risk that a companies sales and earnings are impacted by currency value changes
 - Country where product is produced vs. sold
 - Country where key inputs or resources are derived



EQUITY MANAGER GEOGRAPHIC FOCUS



WHERE ARE WE INVESTING IN EQUITIES?

Developed Markets			Emerging Markets		
North America	Europe	Asia	Americas	Europe & MEA	Asia
Canada United States	Denmark Israel Norway Sweden Switzerland United Kingdom <u>Eurozone</u> <i>Austria</i> <i>Belgium</i> <i>Germany</i> <i>Finland</i> <i>France</i> <i>Ireland</i> <i>Italy</i> <i>Netherlands</i> <i>Portugal</i> <i>Spain</i>	Australia Hong Kong Japan New Zealand Singapore	Brazil Chile Columbia Mexico Peru	Czech Republic Egypt Greece Hungary Poland Qatar Russia South Africa Turkey U.A.E.	China Indonesia India Korea Malaysia Philippines Thailand Taiwan
Frontier Markets					
Americas	Europe & CIS	Africa	Middle East	Asia	
Argentina	Bulgaria Estonia Croatia Kazakhstan Lithuania Romania Serbia Slovenia	Kenya Mauritius Morocco Nigeria Tunisia	Bahrain Jordan Kuwait Lebanon Oman	Bangladesh Pakistan Sri Lanka Vietnam	

Source: MSCI



EQUITY MANAGER STYLE VS. SIZE BOX

<p>Large Cap Value <i>Invests in companies with market caps greater than \$10 billion and low stock prices relative to underlying valuation metrics</i></p>	<p>Large Cap Core <i>Invests in value companies and growth companies with market caps greater than \$10 billion</i></p>	<p>Large Cap Growth <i>Invests in companies with market caps greater than \$10 billion and potential for above average earnings growth</i></p>
<p>Mid Cap Value <i>Invests in companies with market caps between \$2 billion and \$10 billion and low stock prices relative to underlying valuation metrics</i></p>	<p>Mid Cap Core <i>Invests in value companies and growth companies with market caps between \$2 billion and \$10 billion</i></p>	<p>Mid Cap Growth <i>Invests in companies with market caps between \$2 billion and \$10 billion and potential for above average earnings growth</i></p>
<p>Small Cap Value <i>Invests in companies with market caps less than \$2 billion and low stock prices relative to underlying valuation metrics</i></p>	<p>Small Cap Core <i>Invests in value companies and growth companies with market caps less than \$2 billion</i></p>	<p>Small Cap Growth <i>Invests in companies with market caps less than \$2 billion and potential for above average earnings growth</i></p>



EQUITY CHARACTERISTICS

U.S. Large Cap Equities

- **Description**
 - Largest U.S. companies (Exxon, Microsoft, Proctor & Gamble)
- **Why include in a portfolio**
 - 90% of US stock market
 - Attractive returns by investing in well-established companies
 - A core holding in almost all institutional portfolios
- **Managers add value by**
 - Superior selection of stocks or industry sectors through
 - Top-down analysis (identifying broad market trends)
 - Bottom-up analysis (issue by issue analysis)
 - Technical analysis (identifying trends using charts)
 - Fundamental analysis (detailed qualitative or quantitative analysis of individual company stocks)
 - Quantitative Analysis: non-fundamental
- **Catch**
 - More volatile than bonds, can lose money



EQUITY CHARACTERISTICS

U.S. Small and Mid Cap Equities

- **Description**
 - Smaller listed companies in the U.S.
 - Usually smaller than \$10 billion
- **Why include in a portfolio**
 - Greater return potential than large companies, but more risk
 - Some diversification benefits
- **Managers add value by**
 - Discovering stocks not well covered by Wall Street analysts
 - Superior stock selection or industry sector bets through
 - Top-down analysis (identifying broad market trends)
 - Bottom-up analysis (issue by issue analysis)
 - Technical analysis (identifying trends using charts)
 - Fundamental analysis (detailed qualitative or quantitative of individual stocks)
- **Catch**
 - More risk than Large Cap, higher fees, and can lose money



EQUITY CHARACTERISTICS

International Developed Market Equities

- **Description**
 - Companies in developed foreign markets
- **Why include in a portfolio**
 - Attractive returns
 - Diversification: Lower correlations to domestic fixed income and equities
- **Managers add value by**
 - Industry and issue selection
 - Country selection (predicting which markets will outperform)
 - Currency weightings (predicting which currencies will outperform)
- **Catch**
 - More risks (lose money, currency, political)
 - Higher fees & expenses
 - Taxes



EQUITY CHARACTERISTICS

Emerging Market Equities

- **Description**
 - Stocks of developing countries (China, Brazil, Mexico)
 - Markets experiencing rapid economic growth, developing legal and professional infrastructure, and increased consumer spending
- **Why include in a portfolio**
 - Highest expected returns of any liquid public equity class; but also highest risk.
 - Diversification
- **Managers add value by**
 - Like international equity, superior stock, sector, and country selection
 - Avoiding submerging markets (political risk)
 - Managing trading costs and liquidity
 - More research into country (legal issues, accounting practices/transparency, company transparency)
- **Catch**
 - More risk than International Developed Equity (losses, currency, sovereign/political, illiquidity)

APPENDIX: ASSET CLASS ASSUMPTIONS

CORE ASSET CLASS RETURN ASSUMPTIONS

	Asset Class	5-7 Year Return	Change 2019-2018	Volatility
Equity	Cash	2.50%	+.50%	1.00%
	US Inflation	2.25%	-0.25%	-
	Large Cap Equities	6.00%	+0.75%	16.50%
	International Equities (Unhedged)	6.75%	-0.75%	20.50%
	Emerging International Equities	9.25%	+0.25%	28.00%
	<i>Private Equity*</i>	<i>10.01%</i>	<i>+2.01%</i>	<i>24.16%</i>
	Rates/Credit	Treasuries	2.50%	+0.25%
<i>Core Bonds*</i>		<i>3.04%</i>	<i>+0.29%</i>	<i>6.10%</i>
Municipal Bonds (1-10 Year)		3.00%	+0.50%	5.50%
High Yield Bonds		5.25%	+1.50%	12.50%
<i>Private Debt*</i>		<i>7.60%</i>	<i>+1.10%</i>	<i>11.97%</i>
Real Assets	Commodities	4.25%	-0.50%	19.00%
	Midstream Energy	8.25%	+1.00%	18.50%
	REITs	6.75%	+0.25%	20.00%
	Core Real Estate	6.00%	+0.25%	13.00%
Multi-Asset	<i>US 60/40*</i>	<i>5.07%</i>	<i>+0.53%</i>	<i>10.45%</i>
	<i>Global 60/40*</i>	<i>5.08%</i>	<i>+0.17%</i>	<i>10.95%</i>
	<i>Hedge Funds*</i>	<i>5.74%</i>	<i>-0.09%</i>	<i>8.15%</i>

**Calculated as a blend of other asset classes – see page 48 for additional details*



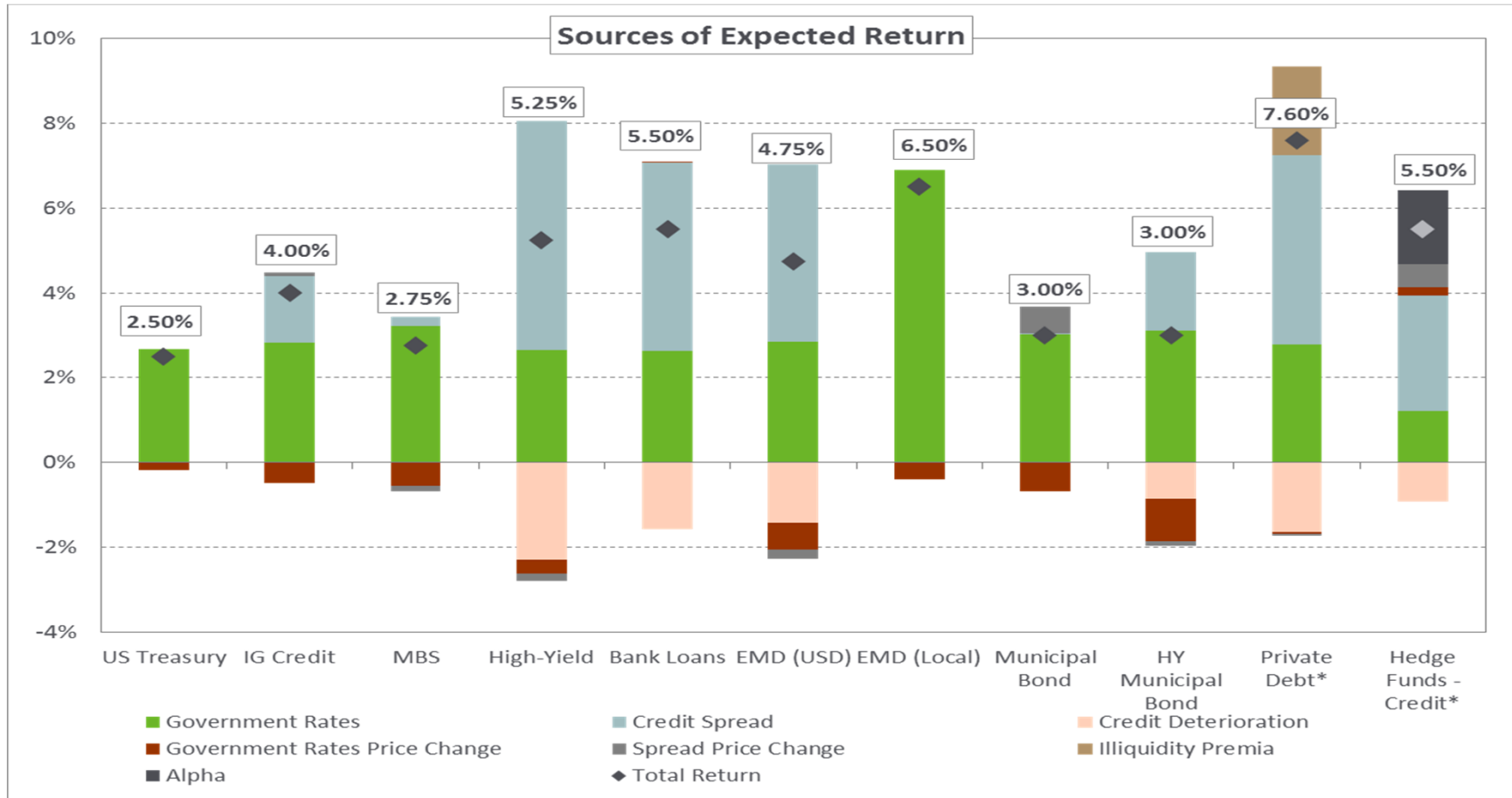
RATES & CREDIT: ASSUMPTIONS

Rate & Credit Building Blocks	
Illiquidity Premium	The additional return expected for investments carrying liquidity risk
Government Rates Price Change	The valuation change resulting from a change in the current yield curve to forecasted rates
Spread Price Change	The valuation change resulting from a change in credit spreads over the duration of the investment and highly sensitive to economic cycles
Credit Deterioration	The average loss for credit securities associated with an expected default cycle and recovery rates
Credit Spread	Additional yield premium provided by securities with credit risk
Government Rates	The yield attributed to sovereign bonds that do not have credit risk associated with their valuation

Asset Class	5-7 Year Return	Change 2019-2018
TIPS	3.00%	-0.25%
Treasuries	2.50%	+0.25%
Investment-Grade Corporate Credit	4.00%	+0.50%
MBS	2.75%	+0.25%
High-Yield Bonds	5.25%	+1.50%
Bank Loans	5.00%	+1.00%
EMD (External)	4.75%	+0.50%
EMD (Local Currency)	6.50%	+0.50%
Non-US Bonds (Unhedged)	0.75%	+0.25%
Municipal Bonds (1-10 Year)	3.00%	+0.50%
High-Yield Municipal Bonds	3.00%	-0.75%
Hedge Funds – Credit	5.50%	+0.50%
<i>Core Bonds</i>	<i>3.04%</i>	<i>+0.29%</i>
<i>Private Debt</i>	<i>7.60%</i>	<i>+1.10%</i>



CREDIT: BUILDING BLOCKS (5-7 YEARS)



Source: NEPC

*Calculated as a blend of other classes – see page 48 for additional details

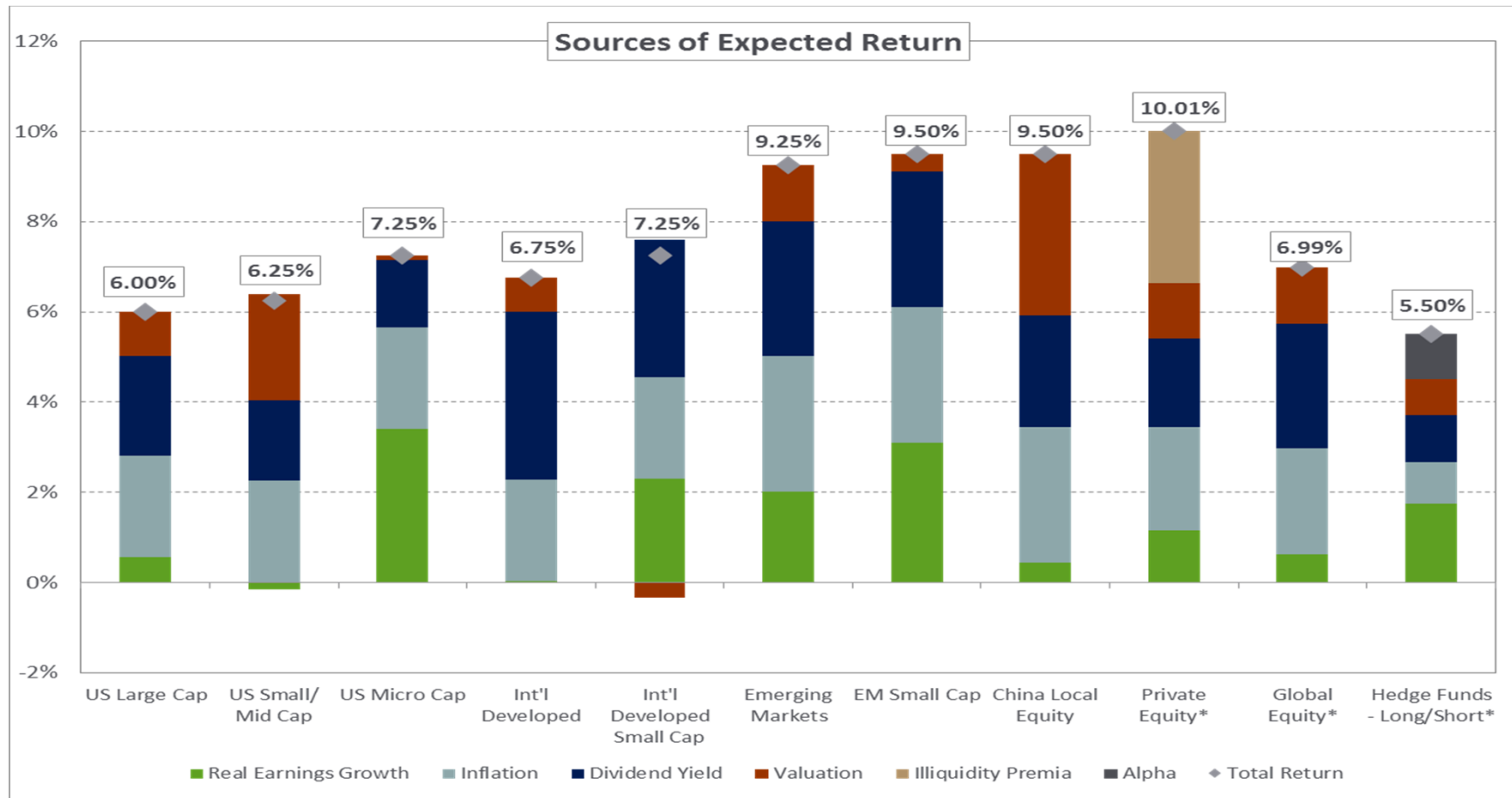


EQUITY: ASSUMPTIONS

Equity Building Blocks	
Illiquidity Premium	The additional return expected for investments carrying liquidity risk
Valuation	An input representing P/E multiple contraction or expansion relative to long-term trend
Inflation	Represents market-specific inflation derived from index country revenue contribution and region-specific forecasted inflation
Real Earnings Growth	Reflects market-specific real growth for each equity asset class as a weighted-average derived from index country revenue contribution and forecasted GDP growth
Dividend Yield	Informed by current income distributed to shareholders with adjustments made to reflect market conditions and trends

Asset Class	5-7 Year Return	Change 2019-2018
US Large Cap	6.00%	+0.75%
US Small/Mid-Cap	6.25%	+0.50%
US Micro Cap	7.25%	N/A
International (Unhedged)	6.75%	-0.75%
International Small Cap	7.25%	-0.50%
Emerging International	9.25%	+0.25%
Emerging Intl. Small Cap	9.50%	+0.25%
China Local	9.50%	N/A
Hedge Funds – Long/Short	5.50%	-0.75%
<i>Global Equity</i>	6.99%	+0.11%
<i>Private Equity</i>	10.01%	+2.01%

EQUITY: BUILDING BLOCKS (5-7 YEARS)



Source: NEPC

*Calculated as a blend of other classes – see page 48 for additional details

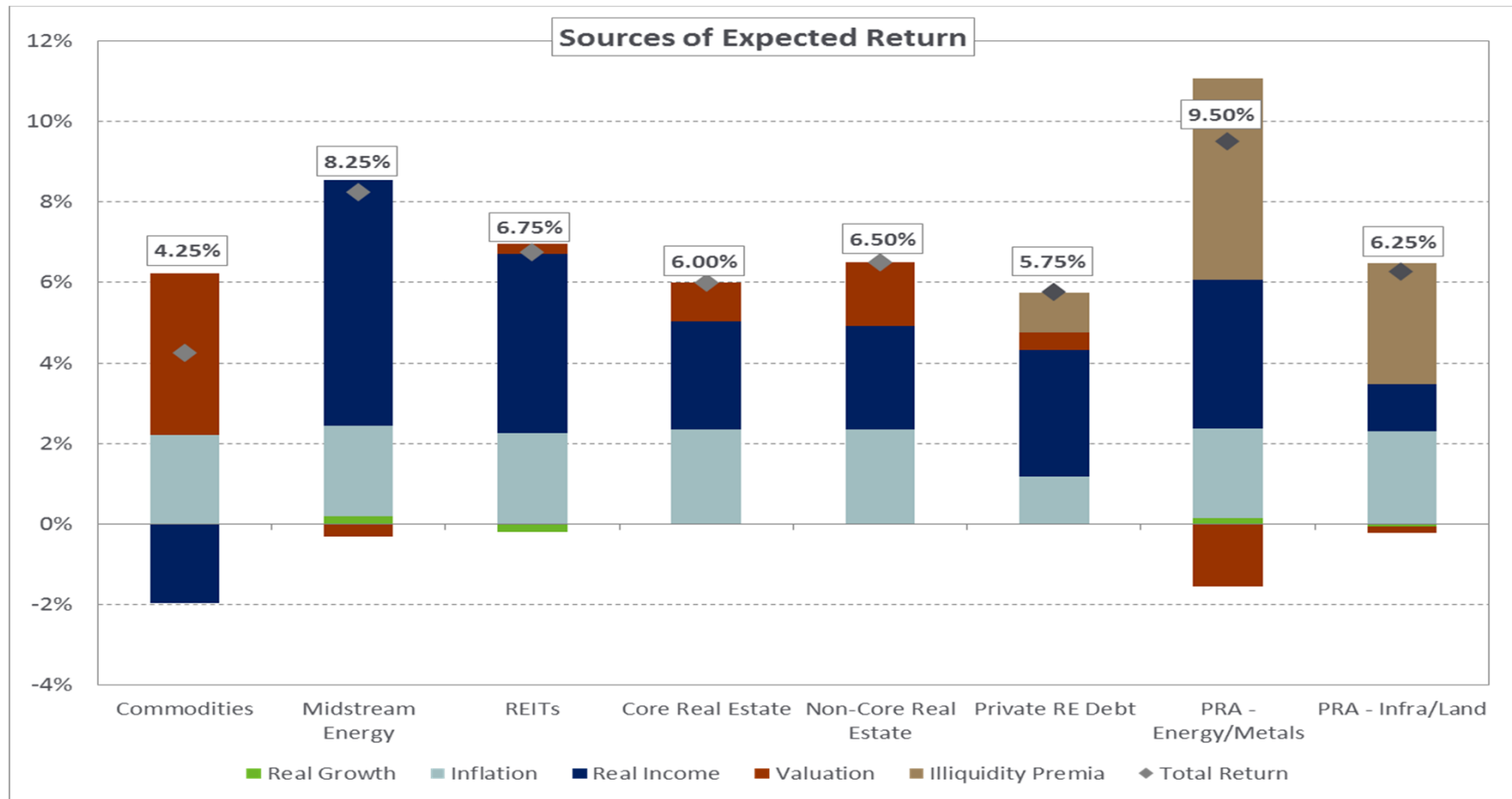


REAL ASSETS: ASSUMPTIONS

Real Assets Building Blocks	
Illiquidity Premium	The additional return expected for investments carrying liquidity risk
Valuation	The expected change in price of the underlying asset reverting to a long-term real average or terminal value assumption
Inflation	Incorporates the inflation paths as defined by TIPS breakeven expectations and NEPC expected inflation assumptions
Real Earnings Growth	Reflects market-specific real growth for each equity asset class as a weighted-average derived from index country revenue contribution and forecasted GDP growth
Real Income	Represents the inflation-adjusted income produced by the underlying tangible or physical asset

Asset Class	5-7 Year Return	Change 2019-2018
Commodities	4.25%	-0.50%
Midstream Energy	8.25%	+1.00%
REITs	6.75%	+0.25%
Core Real Estate	6.00%	+0.25%
Non-Core Real Estate	7.00%	-
Private RE Debt	5.75%	N/A
Private Real Assets: Energy/Metals	9.50%	+1.50%
Private Real Assets: Infrastructure/Land	6.25%	+0.25%

REAL ASSETS: BUILDING BLOCKS (5-7 YEARS)



Source: NEPC



GLOSSARY

GLOSSARY

- **Stock**
 - You own a little piece of a company when you invest/buy stock.
- **Bond**
 - Similar to a loan, you are borrowing from a company when you invest/buy bonds.
- **Leverage**
 - “Adding debt.” Using borrowed money/capital to increase the potential return of an investment.
 - Example: Taking out a loan to buy a house. You will need to pay off the loan plus interest, but hope that you sell the house for more than you bought it for. Thus making a higher return/capital gain.
- **Liquidity**
 - How easily you can sell or buy an asset or security in the market. Some assets have daily and monthly valuation (liquid) and others could have annual valuation or even up to 5-10 year investment periods (illiquid).
- **Custodian**
 - A financial institution that holds securities and other assets for a client. This minimizes the risk of loss or theft.
- **Volatility**
 - Measure of risk or uncertainty about the size of changes in the value of a security.
- **Capital Gain**
 - Profit from the sale of an investment; based on selling your asset/security for a higher price than you bought it for.
- **Capital Loss**
 - Loss from the sale of an investment; based on selling your asset/security for a lower price than you bought it for.



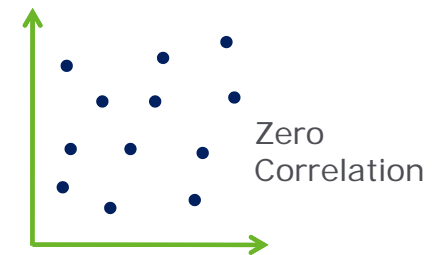
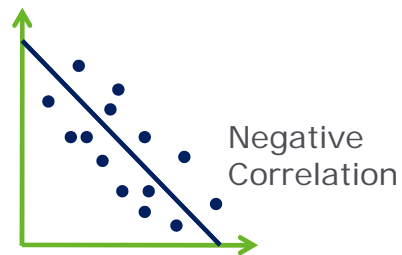
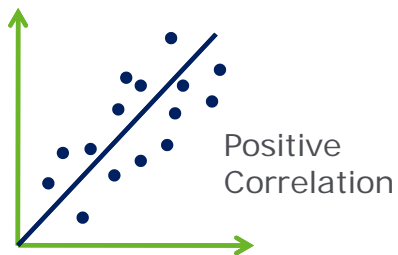
GLOSSARY

- **Index:**
 - A statistical composite that measures changes in the economy or in specific financial markets, usually expressed relative to a base year. Some well-known indexes include the Dow Jones, S&P 500, NASDAQ, Russell and Consumer Price Index (CPI).
- **Benchmark:**
 - Any basis of measurement, such as an interest rate or an index of stock performance, that is used as a reference point for purposes of comparison.
- **Rebalance:**
 - To sell existing investments and buy new investments in order to maintain the agreed-upon asset mix. A discipline to facilitate “buy low/sell high.”
 - However when you buy low the price can go lower, and you can sell high when the price ends up rising higher
 - However, problems can arise when:
 - You sell an investment and the price rises
 - You buy an investment and the price falls
- **Beta**
 - The degree to which a portfolio moves in tandem with the benchmark index.
 - A measure of the overall market’s risk
 - The market’s Beta is 1.0 by definition
 - A portfolio with a beta of 0.5 is half as risky as the market
 - A portfolio with a beta of 2.0 is twice as risky as the market



GLOSSARY

- **Correlation:**
 - A measure of the degree to which two asset classes move together



- **Expected Return:**
 - The expected percentage change in an accounts market value over a defined period of time (evaluation period)
- **Standard Deviation**
 - Statistical measure of the distance a quantity is likely to lie from its average value
 - Measures an investments volatility or “risk”
- **Asset Allocation**
 - An investment strategy that aims to balance risk and reward by apportioning a portfolio's assets according to goals, risk tolerance and investment horizon.

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- Prepared exclusively for attendees of the 2019 NCPERS ACE Conference. Not for redistribution.
- The opinions presented herein represent the good faith views of NEPC as of the date of this presentation and are subject to change at any time.
- The comments provided herein should be considered a general overview and do not constitute investment advice, are not predictive of any future market performance, are not provided as a sales or advertising communication, and do not represent an offer to sell or a solicitation of an offer to buy any security.
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**INVESTMENTS 101:
ALTERNATIVE INVESTMENTS
TRUSTEE EDUCATION SEMINAR**



May 18, 2019

Doug Moseley, Partner



BOSTON | ATLANTA | CHARLOTTE | CHICAGO | DETROIT | LAS VEGAS | PORTLAND | SAN FRANCISCO

BASIC CONCEPTS

WHAT IS AN ASSET?

- **What is an asset?**

- A resource with economic value that a corporation owns or controls expecting that it will provide benefits in the future.

- **What is an asset class?**

- A group of securities that have similar characteristics, act similarly in the marketplace and are subject to the same regulations.

- Each asset class reflects different risk and return characteristics and perform different in the market environment.

- Assets can be broken down further within Traditional asset classes and Alternative asset classes.



TRADITIONAL ASSETS VS. ALTERNATIVE ASSETS

Traditional Assets	Alternative Assets
<ul style="list-style-type: none">• Equity (Stocks)• Fixed Income (Bonds)• Public Real Estate (REITs)• Commodities• TIPS	<ul style="list-style-type: none">• Private Equity• Private Debt• Private Real Estate• Real Assets• Hedge Funds• Global Asset Allocation & Risk Parity

PRIVATE EQUITY

NEPC, LLC

PRIVATE EQUITY OVERVIEW

- **Private Equity is a source of investment capital provided by institutions and high net worth individuals for the purposes of acquiring interests in companies and/or products**
- **Its role in a portfolio is as a return enhancer, with the premium earned over other investment options serving to compensate for the liquidity risk**
- **Large investable universe**
 - Over \$400 billion raised annually across strategies in each of the last three years
 - Over \$3 trillion in assets under management, including portfolio value and un-invested capital
- **Two components of private equity/private debt return:**
 - **Capital Appreciation:** Derived from an increase in the value of an asset between acquisition and sale
 - **Current Income:** Derived from portfolio company operations, loans and leases
- **Investment diversification**
 - Not fully correlated with public equities
 - Access to smaller companies and wider range of strategies



HOW IS PRIVATE EQUITY DIFFERENT FROM PUBLIC EQUITY?

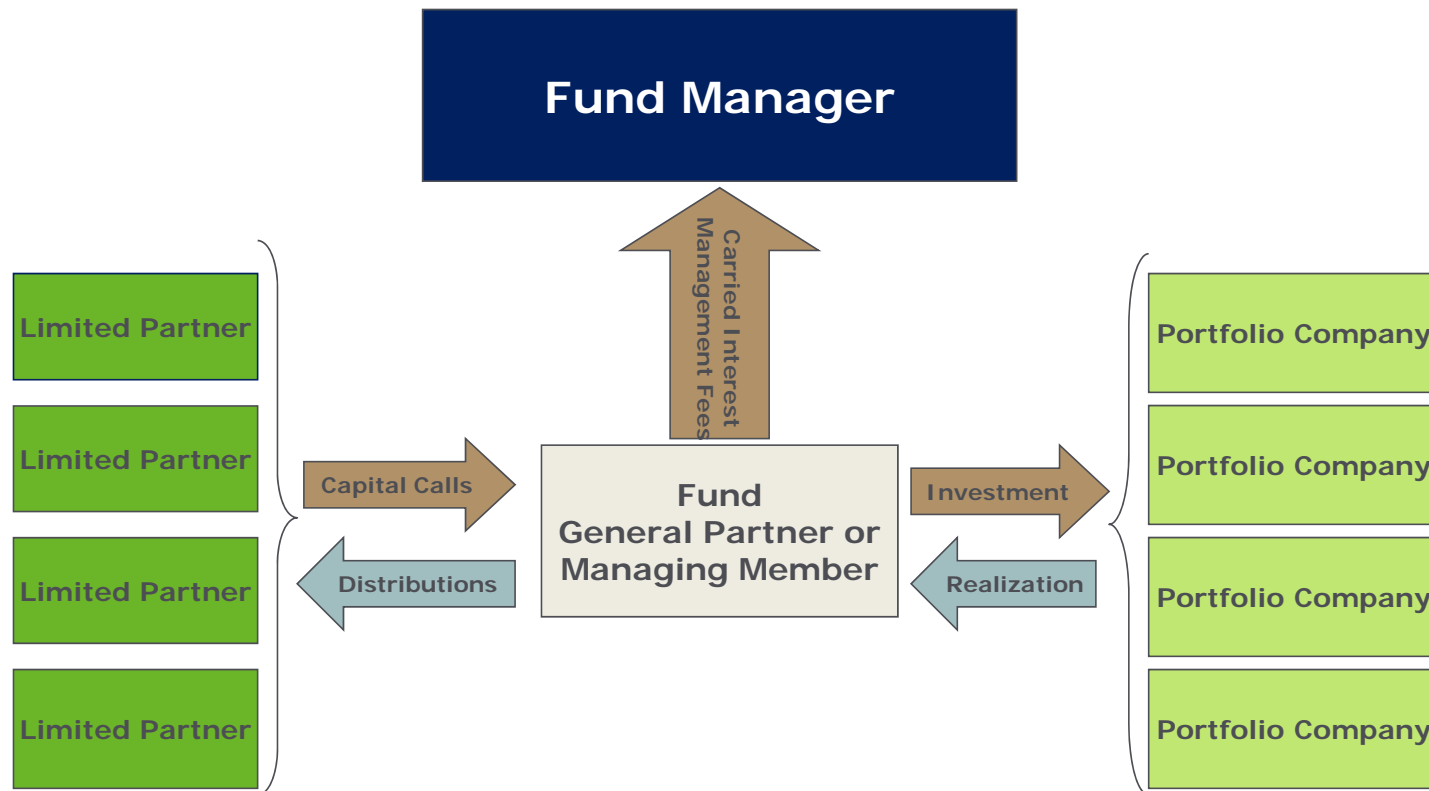
Public Equity

- Daily liquidity
- Invested immediately
- Daily valuations
- Market pricing
- Fees as a % of NAV
- Regulated reporting
- Benchmark managed
- Some activism

Private Equity

- Illiquid, 10+ year closed funds
- Invested over time
- Quarterly valuations
- Estimated fair value
- Fees as % of commitment
- Transparency varies
- Managed for alpha
- Active value creation

MECHANICS OF INVESTING IN PRIVATE EQUITY



PRIVATE EQUITY ECONOMIC RETURN DRIVERS

- **Private equity managers have multiple levers to create value:**
 - Buying low and selling high (multiple arbitrage)
 - Growing EBITDA (through organic revenue growth, cost cutting and making acquisitions)
 - Using leverage
- **Portfolio investments are made throughout the capital structure of target companies**
- **Returns are generated through capital appreciation and current income**
 - Capital appreciation is realized through the eventual sale of a company
 - Current income is derived from portfolio company operations, loans and leases, with loans typically structured to have rate adjustments and equity kickers
- **Leverage can amplify (positively and negatively) returns from current income and capital appreciation**



SPECTRUM OF PRIVATE EQUITY STRATEGIES

Private Equity is not a *'one size fits all'* investment class

It offers a broad range of strategies (and risk/return profiles) that can be customized based on specific investment objectives

Illustrative Sub-Asset Class Return Targets		
Asset Class	Strategy Focus	Typical Return Targets
Venture	Early stage innovative / disruptive companies	15% - 20% IRR, 2.0x TVPI
Growth Equity	Expansion Capital for small, growing businesses	15% - 20% IRR, 1.7x TVPI
Buyouts	Investments to restructure or expand established companies	17% - 20% IRR, 1.8x TVPI
Special Situations	Investments in mature businesses that may be profitable or unprofitable	15% - 20% IRR, 1.8x TVPI
Mezzanine	Subordinated debt to grow or restructure companies	8% - 12% IRR, 1.4x TVPI
Opportunistic Credit	Investment strategy involving various credit-linked opportunities	13% - 17% IRR, 1.3x-1.8x TVPI
Direct Lending	Primarily floating rate senior and/or unitranche (senior and subordinated debt in one instrument) debt capital used for various situations	8% - 12% IRR, 1.3x-1.5x TVPI
Distressed Debt	Companies with Bad Balance sheets	10% - 20% IRR, 1.7x TVPI
Secondaries	Exchange of Limited Partnership interest in established PE partnerships	10% - 15% IRR, 1.5x TVPI
Energy	E&P, transmission, storage, etc. of energy sources	10% - 20% IRR, 1.8x TVPI



FUND MANAGER FEES

FUND MANAGER FEES FOR PRIVATE EQUITY ARE HIGHER AND MORE COMPLEX THAN PUBLIC EQUITY FUNDS

- **Annual Management Fee**
 - Charged as a percentage of commitment (fixed fee) during the investment period
 - Charged as a percentage of net invested capital or NAV after the investment period
 - Generally 1.5%-2.0% fee rates
- **Fund Expenses**
 - One-time fund formation and ongoing administrative and operating costs
 - Can add another 0.3%-1.0% to annual expenses
- **Preferred Return**
 - Rate of return LPs need to achieve before GP can earn carried interest
 - Typically computed on amounts invested and amounts paid for fees to the GP
 - Generally 8%, but can vary by strategy and manager clout
- **Carried Interest**
 - Performance fee paid to the fund manager for profits generated on investments
 - Paid only on realized investments (not on unrealized gains)
 - Generally 20% of realized investment gain
 - Can be lower for lower return strategies or higher for “premium” managers



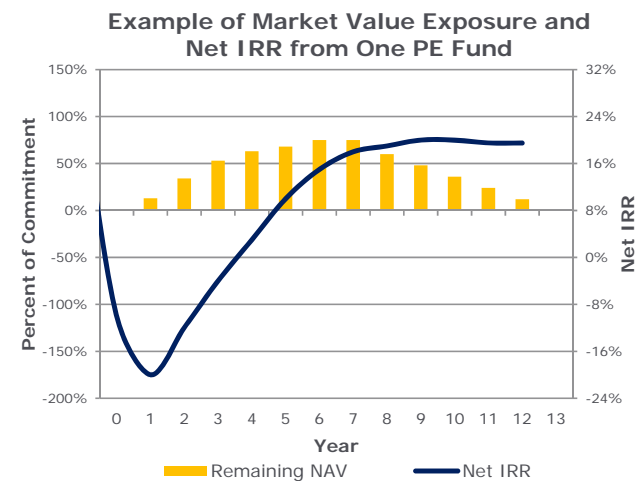
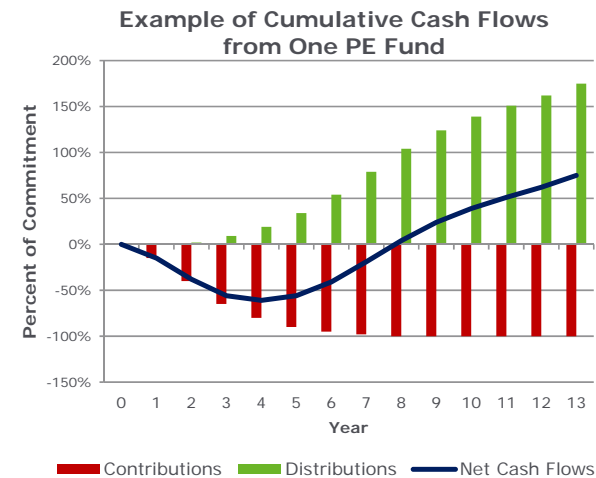
TYPICAL CLOSED-END FUND LIFECYCLE

- **Fundraising, (0 – 2 years)**
 - The time period that is used by the manager to raise sufficient funds for the strategy
 - Limited Partners make an initial “Commitment” to the fund
- **Investing (years 1 – 5)**
 - This is time period that managers use to source investment opportunities. The Fund will make investments during the “Investment Period,” generally the first four or five years of a fund’s life
 - Business plans are put into place as the manager seeks to add value. If an investment does not meet expectations the managers will take steps to mitigate the impact of losses
 - Current income may be paid out during the Investment Period (depending on the strategy), though early distributions may be recalled
 - Limited Partners fund their initial commitments as capital is called over time
- **Harvesting (years 4 – 8)**
 - The time period that managers use to exit the investments through one-off asset sales, portfolio company sales, IPOs, and other exit opportunities
 - The proceeds of the realizations are distributed to the fund’s investors according to a pre-determined schedule, or distribution waterfall, which includes the payment of carried interest to the manager (if applicable)
- **Liquidating (years 7 – 12)**
 - The manager uses this time to exit the remaining investments in the portfolio
 - If the fund life is extended beyond its initial term (as stated in fund legal documents), management fees may be negotiated lower



THE "J-CURVE" OF PRIVATE EQUITY CASH FLOWS AND RETURNS

- **Cash flow pattern of investing in private equity**
 - **Years 1-3 returns are negative**, little income is generated, management fees are collected on committed (not invested) base, business plans established but improvements not yet impacting valuations
 - **Years 3-5 returns flatten out and gradually turn positive** as notable improvement in company financials justify valuation increases, debt refinancing may generate distributions and some income is received
 - **Years 5-10 returns spike** as many assets are sold and accumulated increases in value are reflected, and income is received
 - **Years 11-13 flatten out** as residual assets are liquidated
 - **All years combined** leads to what has been termed the "**J-Curve**."



PRIVATE EQUITY GENERAL TERMS

- **Carried Interest** - The share of profits that the fund manager is due once it has returned the cost of investment to investors
- **Commitment** - Every investor in a private equity fund commits to investing a specified sum of money in the fund partnership over a specified period of time. The fund records this as the limited partnership's capital commitment. The sum of capital commitments is equal to the size of the fund
- **DPI** – A ratio of the amount of capital distributed (D) to investors over the amount of capital called from (or Paid In by) investors
- **EBITDA** – Earnings Before Interest, Taxes, Depreciation and Amortization. Commonly used as a proxy for annual cash flow and often used as the denominator in a ratio to express the valuation of a company (TEV/EBITDA)
- **IRR** – Internal Rate of Return. A time-weighted return expressed as a percentage. IRR uses the present sum of cash drawdowns (money invested), the present value of distributions (money returned from investments) and the current value of unrealized investments
- **Management fee** – This is the annual fee paid to the general partner. It is typically a percentage of limited partner commitments to the fund and is meant to cover the basic costs of running and administering a fund.
- **Preferred return** – Minimum returned distributed to the limited partners until the time when the general partner is eligible to deduct carried interest. The preferred return ensures that the general partner shares in the profits of the partnership only after investments have performed well
- **TVPI** - A ratio of the Total Value (TV) of all distributions and current net asset value over the amount of capital called from (or Paid In by) investors
- **TEV/EBITDA** – common valuation metric for companies, expressed as a ratio of the Total Enterprise Value over an annual EBITDA amount



INVESTMENT FRAMEWORK AND PLANNING: BUILDING A PRIVATE EQUITY PROGRAM

- **In constructing a private markets portfolio there are several key considerations that impact the allocation**

Decision	Implementation Considerations
Investment Objectives	<ul style="list-style-type: none"> • Committee will develop an Investment Policy with goals and guidelines around return objectives, current income and/or capital appreciation, risk and volatility tolerances, liquidity requirements and performance benchmarks • Target allocation will determine commitment pace at a high level • Annual investment plan will determine size of private equity commitments and investment strategy and manager selection based on environment and opportunities available
Investment Thesis	<ul style="list-style-type: none"> • Short term investment objective • Long-term objective • Opportunistic objective
Investment Strategy	<ul style="list-style-type: none"> • Strategy diversification will impact returns and can mitigate the "J-Curve" while managing macro-economic risk • Manager selection has a dramatic impact upon returns; diversification across managers can help mitigate idiosyncratic manager risk
Market Opportunity & Vintage Year Considerations	<ul style="list-style-type: none"> • Vintage year diversification is critical to the program's success • Mitigate vintage year risk through steady commitment pacing • Fund managers control timing of investment acquisitions & dispositions based on market opportunities • LPs can sparingly use secondary sales to lessen exposures

SPECTRUM OF PRIVATE EQUITY INVESTMENT STRATEGIES

Private Equity Investment Style / Overview	Investment Strategy	Sector Exposure	Considerations
Venture Capital <ul style="list-style-type: none"> Return driver: appreciation Expected IRR: 15%-20% Expected TVPI: 2.0x Time Horizon: 6-10 years 	Minority equity investments in startup businesses that are perceived to have significant growth potential	Technology Software Biotech Healthcare Consumer CleanTech	<ul style="list-style-type: none"> Vintage year is important Access to the highest quality managers is paramount Risk of failure is high
Growth Equity <ul style="list-style-type: none"> Return driver: appreciation Expected IRR: 15%-20% Expected TVPI: 2.0x Time Horizon: 3-6 years 	Minority expansion capital for small, growing businesses that are generating cash flow and profits. Generally, these investments have less exposure to technology and leverage risk	Diversified Business Services Technology Healthcare Industrial Consumer	<ul style="list-style-type: none"> Execution risk is high Lack of control positions
Buyouts <ul style="list-style-type: none"> Return driver: appreciation Expected IRR: 17%-20% Expected TVPI: 2.0x Time Horizon: 4-6 years 	Investments in established companies that require capital to expand and/or restructure	Diversified Business Services Technology Healthcare Industrial Consumer	<ul style="list-style-type: none"> Generally high leverage Operational control is key to execution
Special Situations <ul style="list-style-type: none"> Return driver: appreciation and income Expected IRR: 17%-20% Expected TVPI: 2.0x Time Horizon: 3-6 years 	Investments in mature businesses that may be profitable or unprofitable. Investments are often in the equity of the acquired business.	Diversified Business Services Technology Healthcare Industrial Consumer	<ul style="list-style-type: none"> Operational control is key to execution Businesses may have more going concern risk than buyouts

SPECTRUM OF PRIVATE EQUITY MULTI-MANAGER INVESTMENT STRATEGIES

Private Equity Investment Style / Overview	Investment Strategy	Sector Exposure	Considerations
Co-Investments <ul style="list-style-type: none"> Return driver: appreciation and income Expected IRR: 14%-16% Expected TVPI Multiple: 1.8x-2.0x Time Horizon: 5-7 years 	Investments in established companies that require capital to expand and/or restructure	Highly diversified across underlying deals and managers	<ul style="list-style-type: none"> Generally high leverage Co-Investors will not typically have much oversight for investments
Secondary Fund of Funds <ul style="list-style-type: none"> Return driver: appreciation Expected IRR: 14%-18% Expected TVPI Multiple: 1.5x Time Horizon: 2-3 years 	Private equity interests are generally purchased at a discount of NAV from motivated owners of private equity interests. The interests purchased are generally venture and buyout fund and/or company interests with limited exposure to unfunded capital commitments	Highly diversified across underlying managers	<ul style="list-style-type: none"> Limited alpha producing opportunities Most value is generated at time of purchase through discounts and underwriting quality Long lived funds due to diversification
Primary Fund of Funds <ul style="list-style-type: none"> Return driver: appreciation Expected IRR: 10%-16% Expected TVPI Multiple: 1.6x-1.8xx Time Horizon: 5-10 years 	Investments as LP commitments to underlying funds diversified across vintage, strategy, and geography	Highly diversified across underlying managers	<ul style="list-style-type: none"> Limited alpha producing opportunities Long lived funds due to diversification Passive investments Lower fees minimize impact of double layer

SPECTRUM OF PRIVATE DEBT INVESTMENT STRATEGIES

Private Debt Investment Style / Overview	Investment Strategy	Sector Exposure	Considerations
Mezzanine <ul style="list-style-type: none"> Return driver: current income and appreciation Expected IRR: 14%-16% Expected TVPI Multiple: 1.6x-1.7x Time Horizon: 5-7 years 	Primarily fixed rate subordinated (the level of financing senior to equity and below senior debt) debt obligations made to non-investment grade borrowers to effect buyout, M&A or other growth strategies	Companies in a variety of industries that are backed by Private Equity Managers (Sponsored) or not backed by a Private Equity Manager (Sponsor-less)	<ul style="list-style-type: none"> Fund economics play a role in returns Manager has limited recourse due to subordinated position in capital structure
Opportunistic Credit <ul style="list-style-type: none"> Return driver: current income and appreciation Expected IRR: 13%-17% Expected TVPI Multiple: 1.3x-1.8x Time Horizon: 1-4 years 	Investment strategy involving various credit-linked opportunities such as distressed debt, performing and non-performing loans, structured products (CLOs, CDOs), hard assets	Diversified exposure through various access points. Instruments include publicly traded debt securities, private debt, trade claims, mortgage debt, common and preferred stock and commercial paper	<ul style="list-style-type: none"> Thematic Esoteric investments
Distressed (Control) <ul style="list-style-type: none"> Return driver: appreciation and income Expected IRR: 15%-17% Expected TVPI: 1.3x-1.8x Time Horizon: 3-6 years 	Debt investments with the intent to take equity control of companies that have typically defaulted on debt obligations and are in need of financial and operational restructuring.	Diversified	<ul style="list-style-type: none"> Window of opportunity tends to be short lived
Distressed Debt (non-control) <ul style="list-style-type: none"> Return driver: appreciation Expected IRR: 13%-17% Expected TVPI Multiple: 1.3x-1.8x Time Horizon: 1-4 years 	Debt investments in companies that have typically defaulted on debt obligations and are in need of financial and operational restructuring.	Diversified exposure through various access points. Securities can include common and preferred shares, bank debt, trade claims (goods owed) and corporate bonds	<ul style="list-style-type: none"> Vintage year is important Window of opportunity tends to be short lived
Direct Lending <ul style="list-style-type: none"> Return driver: income Expected IRR: 8%-12% Expected TVPI Multiple: 1.3x-1.5x Time Horizon: 2-4 years 	Primarily floating rate senior and/or unitranche (senior and subordinated debt in one instrument) debt capital used for various situations: facilitating changes in ownership through leveraged buyouts or recapitalizations, financing acquisitions, or enabling growth	Companies in a variety of industries that are backed by Private Equity Managers (Sponsored) or not backed by a Private Equity Manager (Sponsor-less)	<ul style="list-style-type: none"> Fund economics play a role in returns Vintage year is important Floating rates, shorter holding periods



REAL ESTATE

NEPC, LLC

REAL ESTATE OVERVIEW

- **Institutional quality/commercial real estate is property intended to generate a return from rental income and/or capital appreciation**
 - Can be publicly traded or privately held
 - Strategies exist spanning the risk/return spectrum from stabilized core real estate to development-oriented opportunistic real estate
 - Main property types include apartments, office buildings, shopping centers, hotels, industrial properties, etc.
- **Two components of real estate return:**
 - **Current Income:** Derived from tenant rents/leases that typically increase with inflation
 - **Capital Appreciation:** Increase in the value of an asset between acquisition and sale
- **Leverage can amplify (both positively and negatively) returns from current income and capital appreciation**



REAL ESTATE AS PART OF AN INVESTMENT PLAN

Pros:

1. Low historical correlation to stocks and bonds
2. Provides diversification benefits to the overall portfolio
3. Provides both current income and the potential for capital appreciation (each of which can be enhanced with leverage)
4. Over the long term, provides a partial hedge against inflation as certain components of real estate are sensitive to inflation
5. Offers a spectrum of investment strategies (with different return and risk expectations) that can be customized to meet plan objectives

Cons:

1. Investments are generally illiquid, particularly during falling markets (excluding public REIT investments)
2. Limited and imperfect benchmarks exist to gauge investment performance
3. Valuations are based on underlying transaction markets which have limited transparency and property appraisals can lag real-time market valuations
4. Investments outside of the base currency are affected by currency movements
5. The use of leverage amplifies negative performance



PRIVATE REAL ESTATE STYLES DEFINED

- **Debt**

- Income-focused
 - Private debt instruments (commercial mortgages and construction)
 - Credit quality is the key of borrowers, tenants, and refinancing sources
 - Managed more like fixed income than real estate
 - Construction and mortgage loans promote job creation

- **Equity**

- Core
 - The most common private equity investment strategy (e.g., the large, open-end commingled funds)
 - Well located, well built properties with stabilized occupancy
 - Majority of total return contributed by current income; less from appreciation
 - Portfolios are generally diversified by property type, geography, and economic drivers
 - Leverage typically low (10-30%)
- Value Added (US and Foreign)
 - Focused on creating value by physically renovating and/or re-tenanting “problem” properties
 - Majority of total return contributed by value appreciation - limited current income
 - Includes closed-end and open-end commingled funds
 - Leverage – Moderate
- Opportunistic
 - The riskiest investment strategy, with the potential for the highest returns
 - Strategies include ground-up development and reworking distressed portfolios
 - Negative cash flows initially, with virtually all the return coming from capital appreciation (J-curve)
 - Some portfolios include international investments



CORE PROPERTY TYPES SECTORS

Office, retail, multifamily, industrial and, to a lesser extent, hotels, are generally viewed as the primary or “core” real estate sectors

Sector	Example Property Types	Key Economic Drivers	Lease Considerations
Office	<ul style="list-style-type: none"> • CBD Office • Suburban office 	<ul style="list-style-type: none"> • Job growth • Employment rate • Productivity rates 	<ul style="list-style-type: none"> • Longer-term leases that can lag current market lease rates which produces step-ups or step-downs at lease maturity • Credit quality of tenants, lease lengths
Retail	<ul style="list-style-type: none"> • Regional malls • Shopping centers • Factory outlet centers 	<ul style="list-style-type: none"> • Consumer spending • Employment rate • Job growth 	<ul style="list-style-type: none"> • Leases frequently contain a base rent plus percent of the gross sales • Longer-term leases that can lag current market lease rates which produces step-ups or step-downs at lease maturity • Credit quality of tenants, lease lengths
Multifamily / Apartment	<ul style="list-style-type: none"> • High-rise apartment • Garden style apartment 	<ul style="list-style-type: none"> • Demographic trends • Home ownership rates • Employment rate • Job growth 	<ul style="list-style-type: none"> • Leases are typically 1-2 years and adjust quickly to current market conditions
Industrial	<ul style="list-style-type: none"> • Warehouse / distribution • Flex industrial • Trans-shipment • R&D space 	<ul style="list-style-type: none"> • Business inventory levels • Import / export volumes • Employment rate • Job growth 	<ul style="list-style-type: none"> • Longer-term leases that can lag current market lease rates which produces step-ups or step-downs at lease maturity • Releasing requires smaller or minimal tenants improvements
Hotel / Lodging*	<ul style="list-style-type: none"> • Full-service • Limited service • Extended stay 	<ul style="list-style-type: none"> • Business spending / travel • Consumer spending / leisure travel • Employment rate • Job growth 	<ul style="list-style-type: none"> • Leases are nightly and hotels have high fixed operating costs • Property net operating income more volatile relative to other property sectors • Asset management is critical



* Although the hotel / lodging sector is frequently included as a “core” real estate sector, the risk / return profile of the sector is higher than the other four “core” real estate sectors

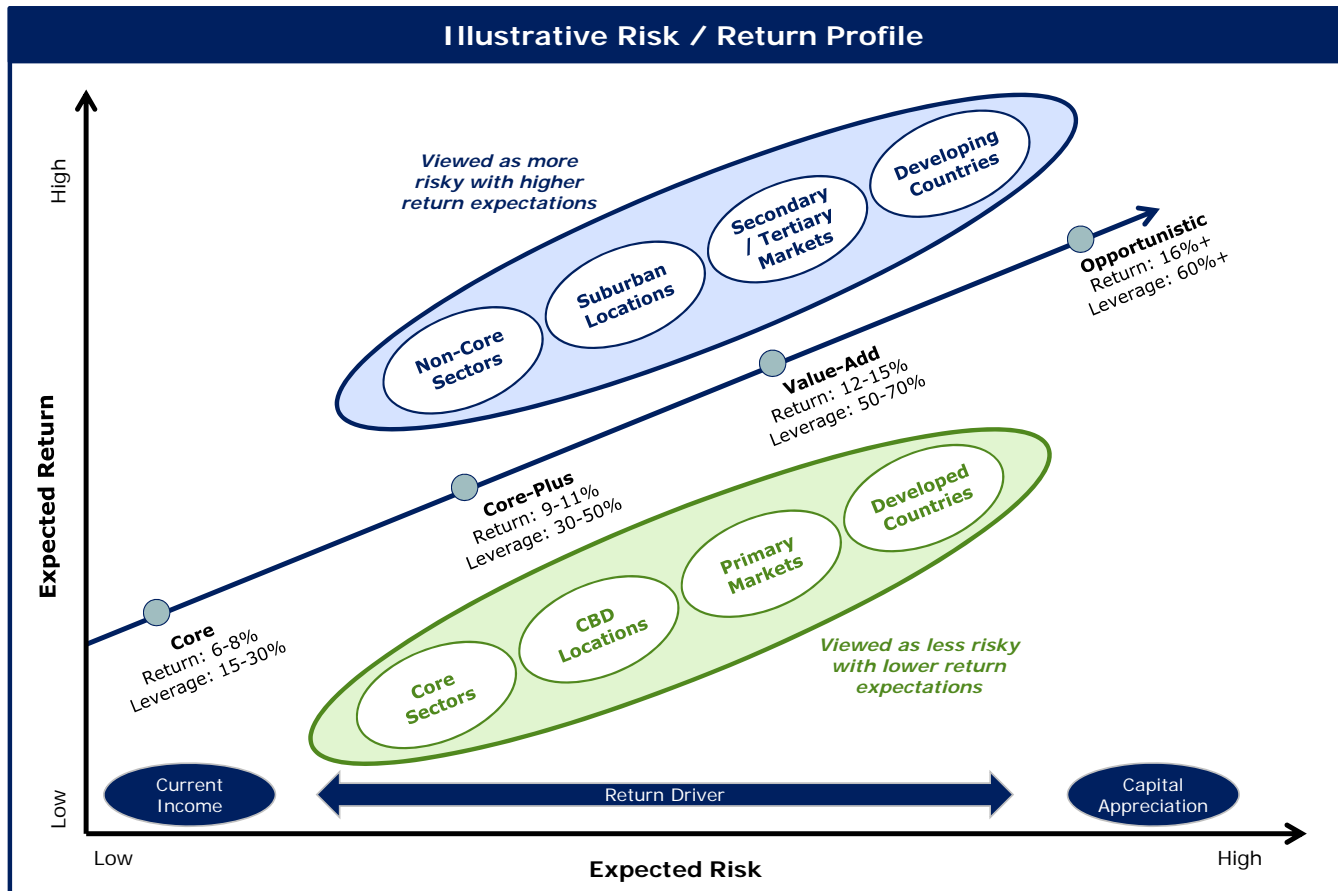
NON-CORE PROPERTY TYPES

Healthcare, senior housing, self-storage and other more niche sectors are frequently viewed as secondary or “non-core” real estate sectors

Sector	Example Property Types	Sector Economic Drivers	Lease Considerations
Healthcare	<ul style="list-style-type: none"> • Medical office • Hospitals • Life science 	<ul style="list-style-type: none"> • Healthcare spending • Demographic trends 	<ul style="list-style-type: none"> • Longer-term leases that can lag current market lease rates which produces step-ups or step-downs at lease maturity
Senior Housing	<ul style="list-style-type: none"> • Independent living • Assisted living • Dementia care • Alzheimer's care • CCRCs • Skilled nursing 	<ul style="list-style-type: none"> • Demographic trends • Healthcare spending • Home prices (specifically for entrance fee CCRCs and independent living) 	<ul style="list-style-type: none"> • Leases (or rents) vary per product type and level of care • Private pay versus government subsidized is important consideration • CCRCs can use entrance fee models where an incoming resident provides an “entrance deposit” which is fully or partially refundable at move-out
Self-Storage	<ul style="list-style-type: none"> • General self storage • RV / boat storage • Container storage 	<ul style="list-style-type: none"> • Consumer spending • Business spending 	<ul style="list-style-type: none"> • Leases are typically short term (monthly) and rental rates are adjusted on a daily / weekly basis relative to market conditions
Student Housing	<ul style="list-style-type: none"> • Multifamily-style properties near large universities 	<ul style="list-style-type: none"> • Demographic trends 	<ul style="list-style-type: none"> • Properties have very high turnover (near 100% per year) • Co-signers are frequently required for students
Other Niche Sectors	<ul style="list-style-type: none"> • Manufactured homes • Data centers • Marinas • Ski resorts • Single industry buildings 	<ul style="list-style-type: none"> • Varies per property type 	<ul style="list-style-type: none"> • Lease terms vary per property type



RELATIVE EXPECTED RISK RETURN PROFILE OF REAL ESTATE SECTORS AND GEOGRAPHIC / MARKET FOCUS



Notes:

- Debt-related strategies can span the illustrative risk / return spectrum depending on the specific strategy
- Manager-specific risk, operations and leverage can skew expected risk / return profile



HEDGE FUNDS

NEPC, LLC

WHAT IS A HEDGE FUND?

- **Definition:** An alternative investment vehicle accessed by accredited investors that invests across a broad range of securities using leverage, shorting, and locked-up capital to earn active return.
- **NEPC groups hedge funds across four primary sub-strategies: equity-linked, credit-linked, event driven and global macro.**
 - Sector vs. generalist
 - Geographic specialists
 - Quantitative vs. fundamental strategies
- **Typically owned and managed by private partnerships, hedge funds are generally less transparent and have fewer regulations than traditional investments.**
- **Compensation structure: managers are paid a management fee (1.0% to 2.0% of the Fund NAV annually) and a performance fee (usually 10% to 20% of profits). Typically, hedge fund managers report returns net of fees.**



WHY INVEST IN HEDGE FUNDS?

Diversification:

- Hedge funds can provide diversification benefits to a total portfolio through historically low correlations to traditional asset classes

Risk-adjusted returns:

- May provide investors with better risk-adjusted returns and a “smoother ride” through historically lower volatility and smaller drawdowns relative to other risk assets

Access to non-traditional strategies:

- Hedge funds utilize strategies and implementation tools less available to traditional investment vehicles
 - Broad flexible mandates or specialized niche strategies
 - Use of shorting and leverage
 - Illiquid investments



COMPARISON TO OTHER INVESTMENT STRUCTURES

	Long-Only Funds	Hedge Funds
Value proposition	Market dependent; Benchmark oriented	Skill based; Benchmark agnostic
Type of exposure	Long only	Flexible exposure: long or short, market neutral
Investing style	Style constraints (value, growth, etc.)	Broad guidelines, few constraints
Instruments traded	Predominately publicly traded stocks and bonds	Stocks, bonds, derivatives (futures, swaps, options), privates
Leverage employed	Usually none	Frequently employ leverage, varies by manager/strategy
Alignment of interests	Varied co-investment amount and ownership position	Large manager co-investment, ownership position
Liquidity	Frequent liquidity	Restricted liquidity
Business model	Scalable	Capacity constrained

BENEFITS & RISKS VS. TRADITIONAL INVESTMENT STRUCTURES

Pros:

- Incentive structure focused on performance during all market environments
- Potential for uncorrelated returns to traditional asset classes
- Strategies often reduce overall portfolio volatility and drawdowns
- Potentially superior capital preservation vehicles

Cons:

- Complicated entities, more challenging to evaluate managers
- Liquidity constraints
- Less transparent
- Higher fees
- Can be difficult to access top managers
- Potential for higher “headline risk”
- Regulatory environment in flux



SUB-STRATEGIES EXPLAINED

Strategy	Definition
Equity-Linked	<ul style="list-style-type: none"> Managers combine a long portfolio with the short sale of stocks Portfolios range from net short to net long, depending on market conditions Aggressive funds may capture returns by exceeding 100% exposure while conservative funds mitigate market risk by maintaining net exposures of between 0-50%
Credit-Linked	<ul style="list-style-type: none"> Managers invest across the spectrum of fixed-income/credit assets ranging from sovereign bonds and corporate debt to securitized products, seeking to capitalize on both yield/income and capital appreciation. Strategies utilizes quantitative and qualitative analysis to identify mispricings Can be directional (focused on a single security) or relative value (focused on relationship between securities) Examples include credit long/short, capital structure arbitrage, convertible arbitrage, and fixed income arbitrage; some overlap with distressed-oriented event-driven strategies
Event-Driven	<ul style="list-style-type: none"> Managers invest in situations with the expectation that a near term event will act as a catalyst changing the market's perception of a company, thereby increasing or decreasing the value of its equity or debt Events include, bankruptcies, financial restructurings, mergers, acquisitions and spin-offs Three types of event disciplines: merger arbitrage, distressed securities and special situations
Global Macro	<ul style="list-style-type: none"> Trade highly liquid instruments, long and short, including currencies, commodities, fixed income instruments and equity indices Low correlation to traditional and alternative asset classes Discretionary strategies employ broad analysis of economic, financial and political data to identify themes Systematic strategies use algorithmic models to analyze historical data, both technical and fundamental
Multi-Strategy	<ul style="list-style-type: none"> Managers employ a diversified portfolio with various investment approaches Strategies may include convertible arbitrage, merger arbitrage, and fixed income arbitrage positions Managers can over or under-weight different strategies to capitalize best on current investment opportunities



Please see Appendix for detail on each sub-strategy

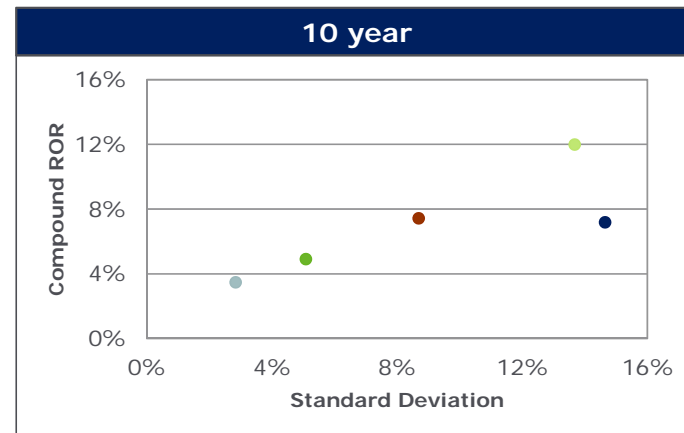
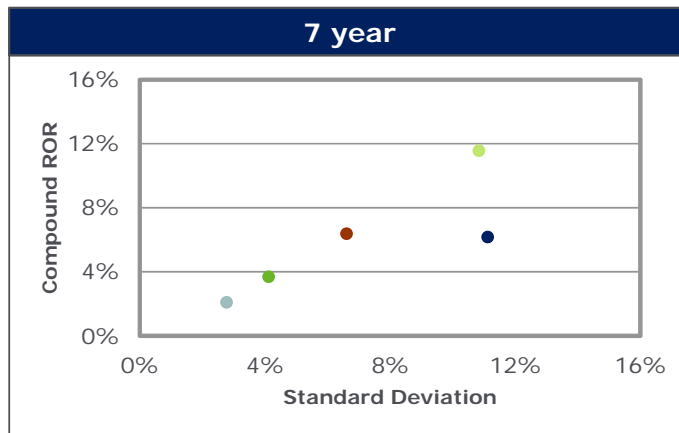
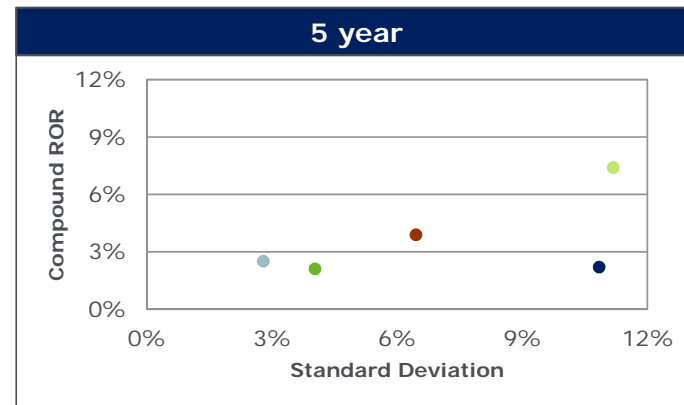
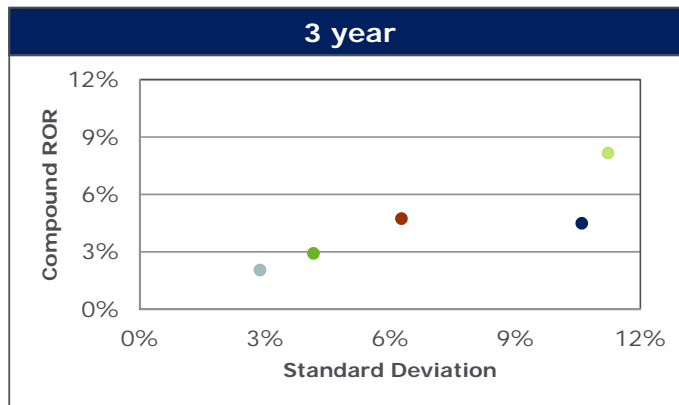
HEDGE FUND GENERAL TERMS

- **Hedge Fund:**
 - A private partnership where the General Partner receives management and incentive fees in exchange for investment performance. In pursuing its investment strategy and goals, the General Partner has a more flexible investment mandate and set of investable instruments at his disposal.
- **Long position:**
 - Owning a security – goal is to buy low, sell high (up movement is good)
- **Short position:**
 - Selling a security – goal is to sell high, buy low (down movement is good)
- **Arbitrage:**
 - The simultaneous purchase and sale of an asset in order to profit from a difference in the price
- **Gross Exposure:**
 - Aggregate of long and short investment positions in relation to the Net Asset Value (NAV)
- **Net Exposure:**
 - Difference between the long and short positions
- **Alpha:**
 - The value added or subtracted by a fund manager. Usually calculated with reference to a benchmark.
- **Beta:**
 - Market driven performance
- **Leverage:**
 - Increasing exposure to markets (both long and short) by borrowing or use of derivatives.



RISK-RETURN COMPARISON

● HFRI Composite ● S&P 500 ● Barclays Agg ● MSCI ACWI ● 60/40 Stock/Bond Portfolio

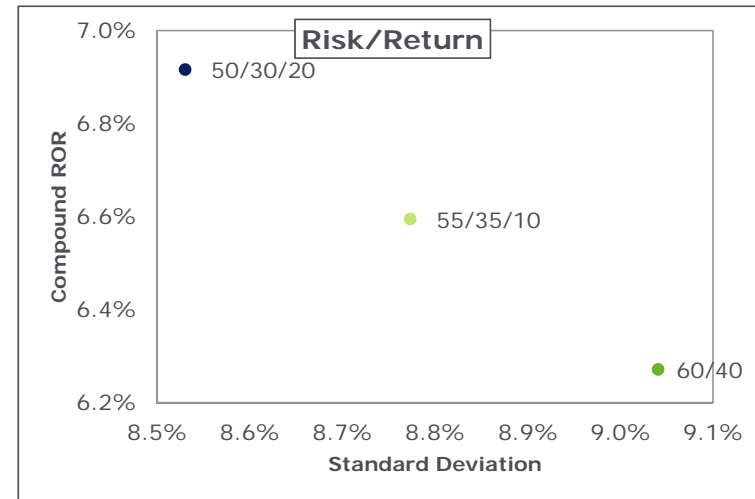


Source: eVestment, HFR Database as of 12/31/2018
 60/40 Stock/Bond Portfolio represents 60% MSCI World and 40% Barclays Agg
 Past performance is no guarantee of future results



PORTFOLIO DIVERSIFICATION BENEFITS

Historical Correlation	HFRI Fund Weighted Composite Index
S&P 500	0.73
MSCI World	0.75
Barclays Agg	0.09
BofA ML HY	0.65



Portfolio compositions reflect monthly-rebalanced allocations to MSCI World, Barclays Aggregate Bond Index and HFRI Fund Weighted Composite Index respectively (i.e. 60/40 is 60% MSCI World, 40% Barclays Aggregate)

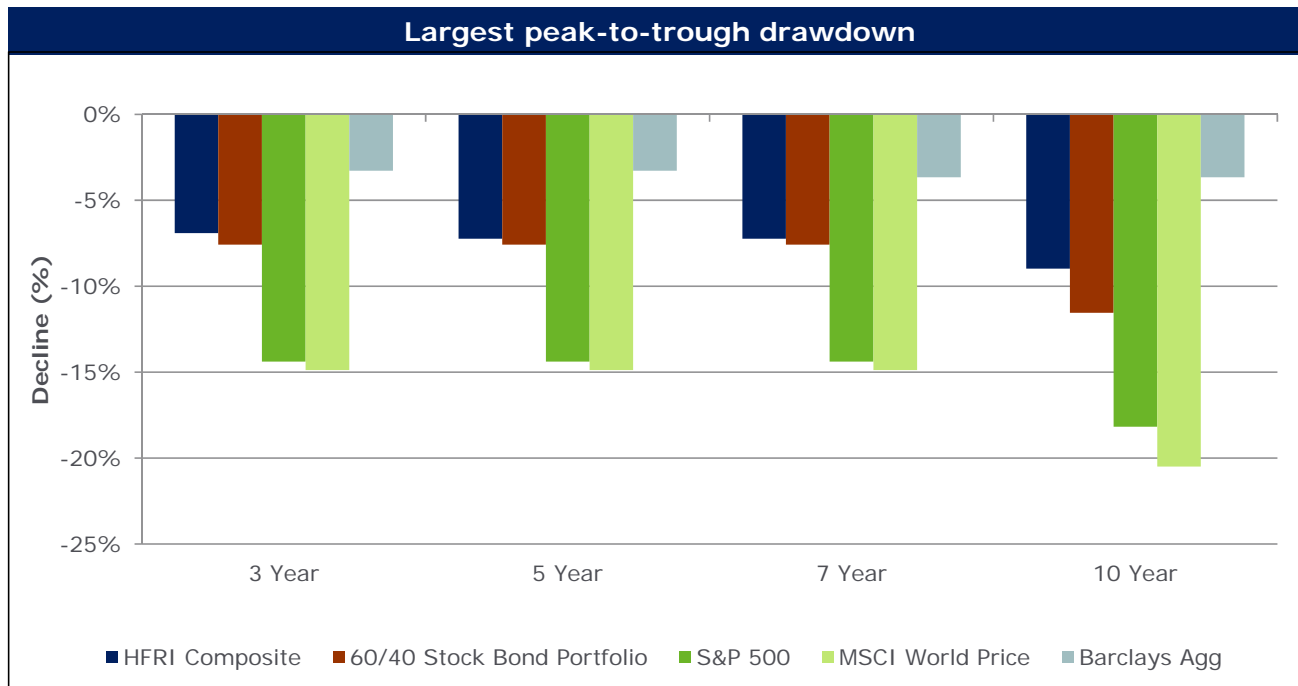
- **Over the long-term, hedge funds have demonstrated lower correlation to traditional asset classes**
 - Higher correlation to equities for HFRI Fund Weighted Composite (FWC) Index reflective of increased exposure to equity strategies
- **Incorporating hedge funds into an investment portfolio has historically aided in reducing volatility while preserving and/or improving return**

*Sources: eVestment, HFR, data calculated from 1/31/1990 through 12/31/2018
Past performance is no guarantee of future results*



RISK-RETURN COMPARISON

Hedge funds have preserved capital effectively during large drawdown periods

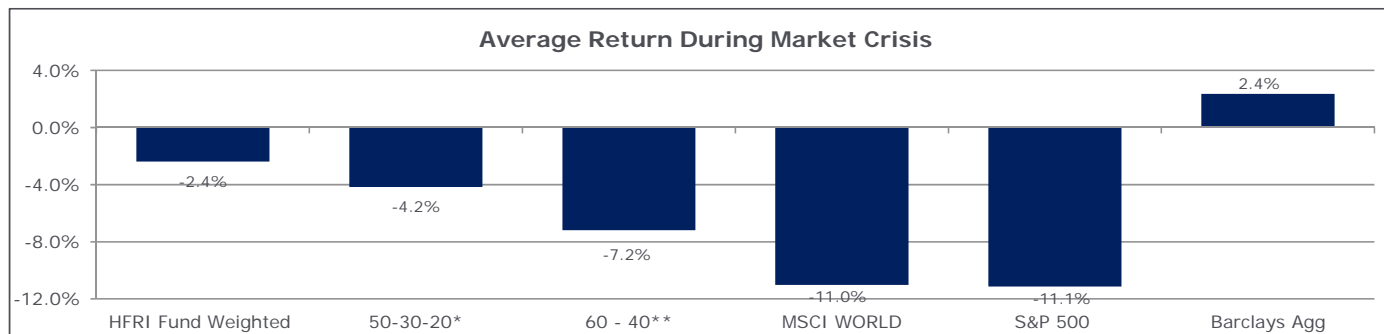
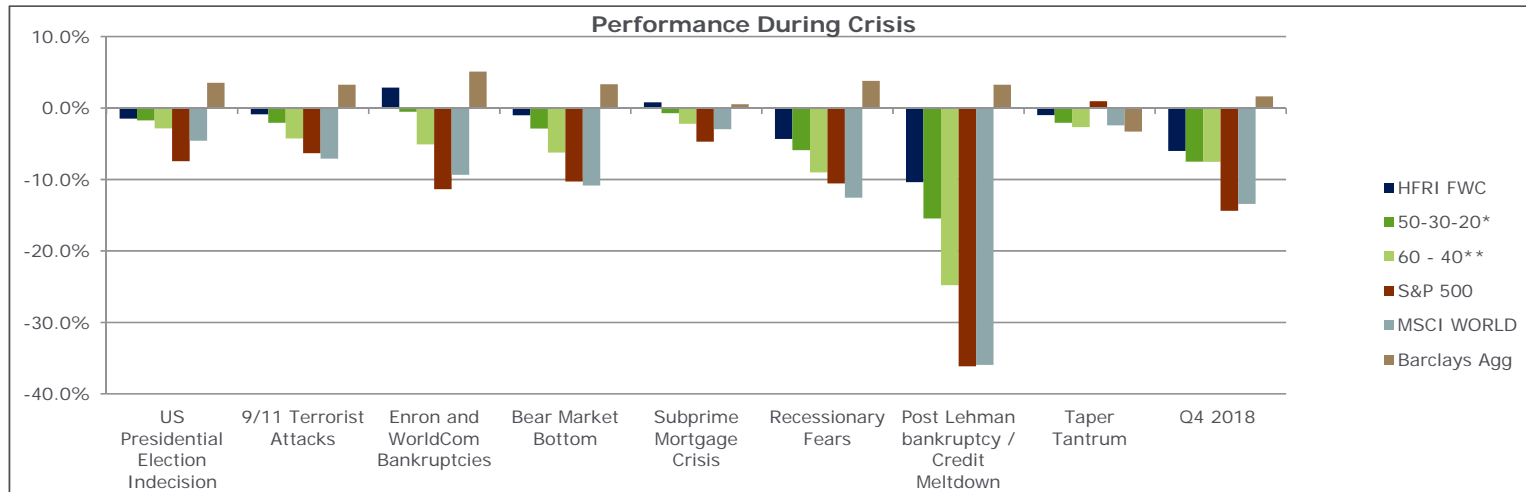


Source: eVestment, HFR, as of 12/31/2018
60/40 Stock Bond Portfolio represents 60% MSCI World and 40% Barclays Agg
Past performance is no guarantee of future results



HEDGE FUNDS DURING CRISIS

- Historically, hedge funds have effectively preserved capital during market crises



*50-30-20 represents a portfolio of 50% MSCI World 30% Barclays Agg and 20% HFRI Fund Weighted Composite
 **60-40 represents a portfolio of 60% MSCI World and 40% Barclays Agg
 Past performance is no guarantee of future results



REAL ASSETS

NEPC, LLC

WHAT ARE REAL ASSETS?

- **What are Real Assets?**

- Real Estate
- Commodities
- Timber
- Inflation-linked products
- Treasury Inflation Protected Securities (TIPS), inflation-sensitive equities, etc.

- **Why invest in Real Assets?**

- Diversification
- Offers “real” (after inflation) return

- **Challenges**

- Liquidity – depends on the strategy
 - Liquidity can also impact the correlation to periods of rising inflation
- Return expectations
 - Generally have lower expected returns than equities
- Can underperform traditional markets for extended periods of time
 - Is now the right time for inflation protection?

- **Goal of real assets: help the portfolio maintain purchasing power through periods of rising inflation**



REAL ASSET SUB-SECTORS AND INVESTMENT STRUCTURES

Public Market or Liquid Strategies	Private Market or Illiquid Strategies
US TIPs	
Emerging Markets Currency/Bonds	
Real Estate	Real Estate
Energy	Energy
Commodities	Commodities (Metals & Mining)
Infrastructure	Infrastructure
Timber	Timber
Agriculture	Agriculture

↓

Active and Passively Managed Funds

↓

Open-end and Closed-End PE Funds

“CORE” REAL ASSET SECTORS

- The following sectors of Real Assets generate a higher percentage of returns from current income/and or have lower expected returns

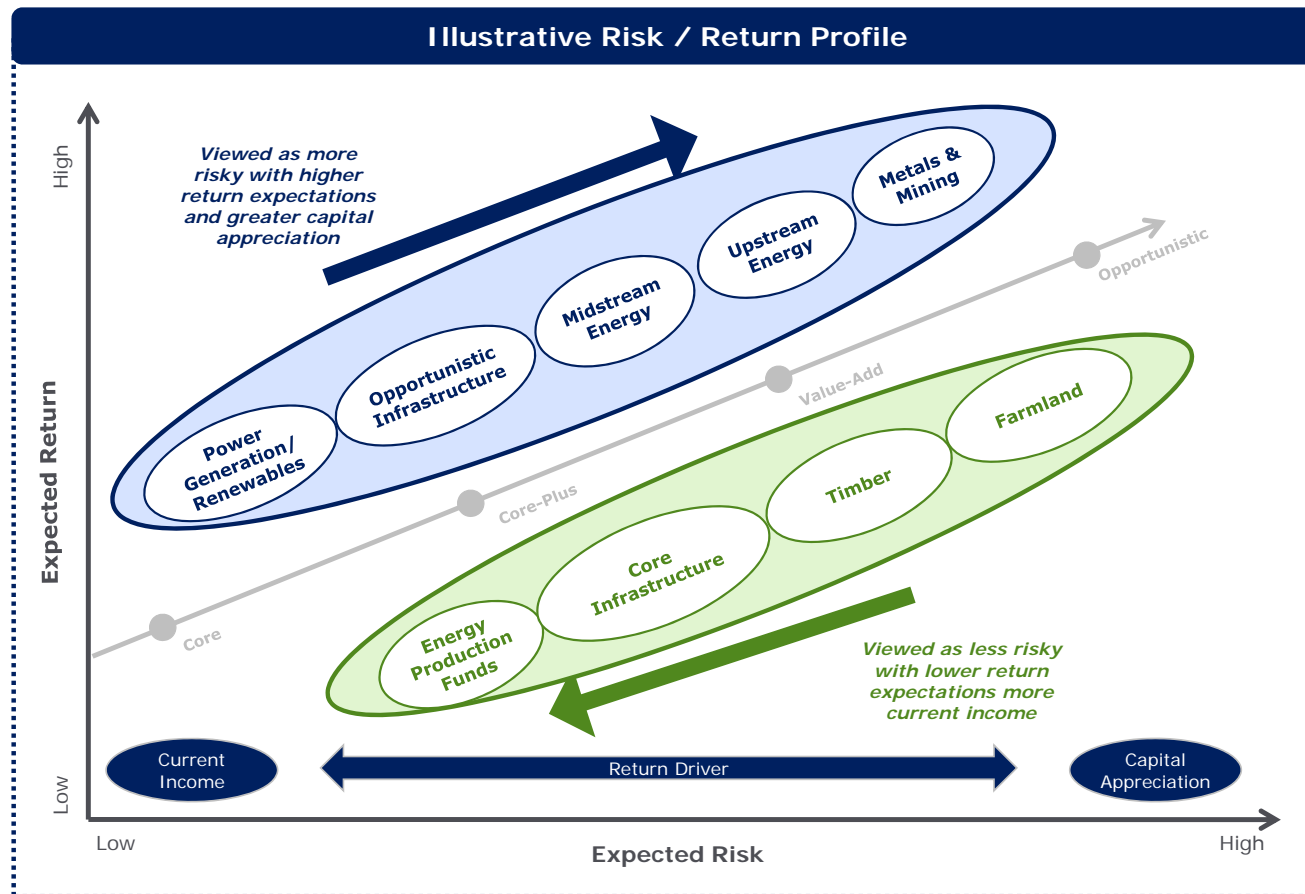
Sector	Example Property Types	Key Return Drivers
Core Infrastructure	<ul style="list-style-type: none">• Roads/Parking• Ports• Midstream Energy/Utilities• Water/Waste Water	<ul style="list-style-type: none">• GDP growth• Monopolistic markets with high barriers to entry which limits competition
Farmland	<ul style="list-style-type: none">• Row Crops• Permanent Crops• Protein• Dairy	<ul style="list-style-type: none">• Biological growth• Crop prices• Land value
Timber	<ul style="list-style-type: none">• Timberland – diversified by region and species	<ul style="list-style-type: none">• Biological Growth• Timber price• Land value

“OPPORTUNISTIC” REAL ASSET SECTORS

- The following sectors of Real Assets can be classified as “opportunistic” since capital appreciation typically drives returns

Sector	Example Property Types	Sector Economic Drivers
Upstream/ Midstream Energy	<ul style="list-style-type: none"> • Oil and Gas E&P • Oilfield/Pipeline services • Pipelines/Storage • Transmission/Distribution 	<ul style="list-style-type: none"> • GDP growth • Commodity price movements
Metals and Mining	<ul style="list-style-type: none"> • Precious metals (gold, silver) • Base metals (copper, zinc) • Development mostly, some production 	<ul style="list-style-type: none"> • GDP Growth • Commodity price movements
Opportunistic Infrastructure	<ul style="list-style-type: none"> • Greenfield/Brownfield projects consisting of multiple expansion or consolidation of services 	<ul style="list-style-type: none"> • GDP growth • Regulated Markets • Government concessions or incentives
Power Generation/ Renewables	<ul style="list-style-type: none"> • Coal Plants • Natural Gas Plants • Solar • Wind • Hydro • Biomass, Nuclear, others 	<ul style="list-style-type: none"> • GDP growth • Regulatory initiatives • Government incentives

RELATIVE EXPECTED RISK RETURN PROFILE OF REAL ASSET SECTORS



Note: Debt-related strategies can span the illustrative risk / return spectrum depending on the specific strategy
 Note: Manager specific risk, operations and leverage can skew expected risk / return profile



GLOSSARY

- **Index:**
 - A statistical composite that measures changes in the economy or in specific financial markets, usually expressed relative to a base year. Some well-known indexes include the Dow Jones, S&P 500, NASDAQ, Russell and Consumer Price Index (CPI).
- **Benchmark:**
 - Any basis of measurement, such as an interest rate or an index of stock performance, that is used as a reference point for purposes of comparison.
- **Rebalance:**
 - To sell existing investments and buy new investments in order to maintain the agreed-upon asset mix. A discipline to facilitate “buy low/sell high.”
 - However when you buy low the price can go lower, and you can sell high when the price ends up rising higher
 - However, problems can arise when:
 - You sell an investment and the price rises
 - You buy an investment and the price falls
- **Beta**
 - The degree to which a portfolio moves in tandem with the benchmark index.
 - A measure of the overall market’s risk
 - The market’s Beta is 1.0 by definition
 - A portfolio with a beta of 0.5 is half as risky as the market
 - A portfolio with a beta of 2.0 is twice as risky as the market



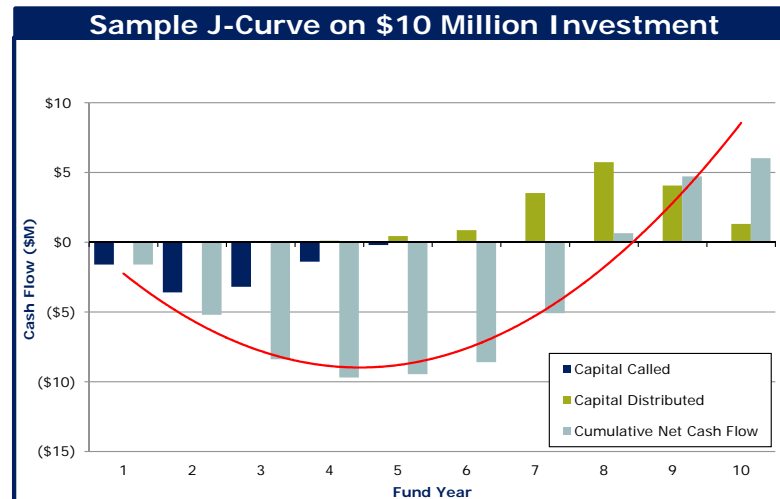
APPENDIX

NEPC, LLC

GLOSSARY

- **J-Curve Effect**

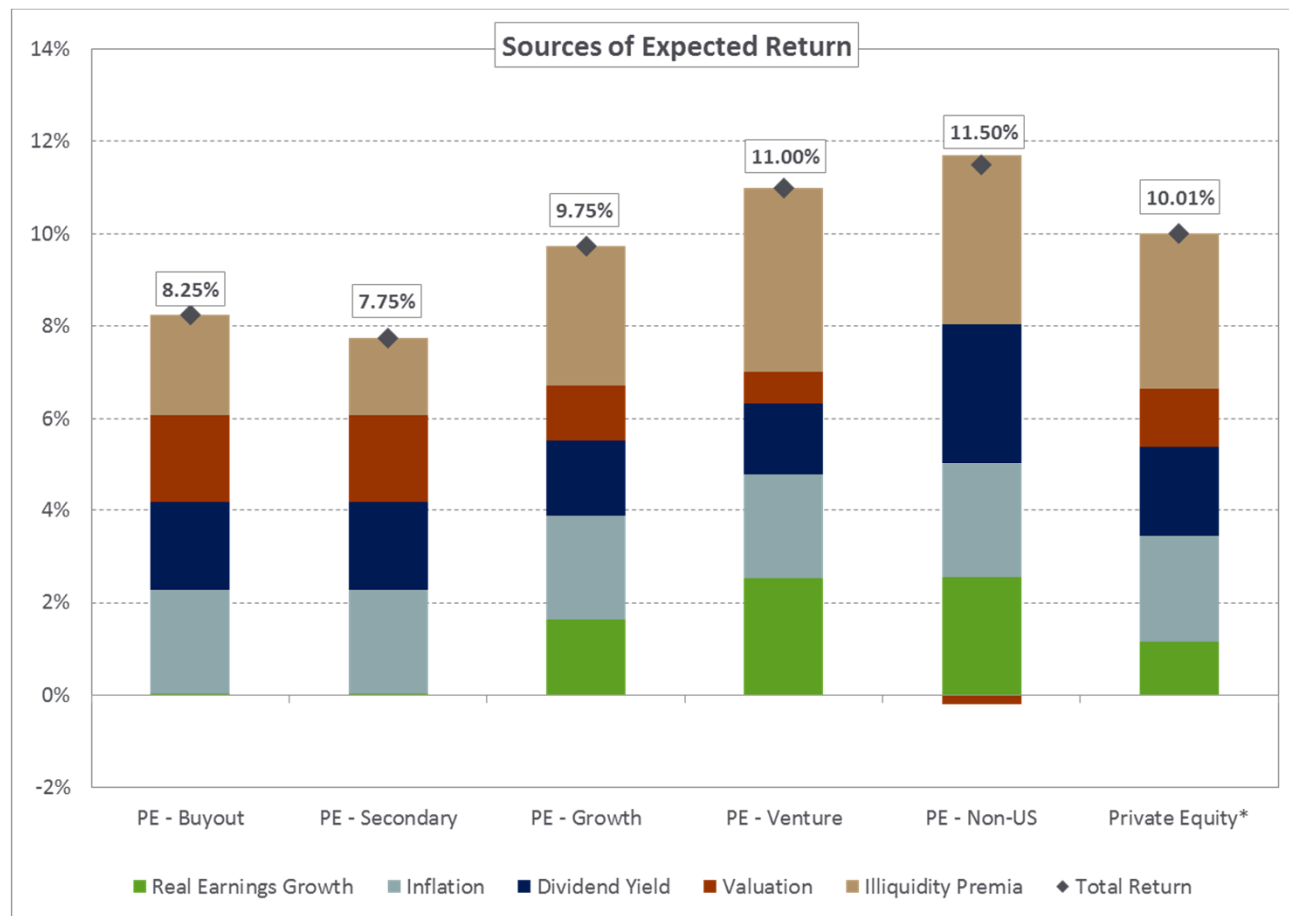
- A diagram where the curve falls at the outset and eventually rises to a higher point, thus creating the shape of a “J”. In Private Equity, funds experience negative returns for the first several years as the portfolio raises capital. If the fund is well managed, it will recover from its losses and gain higher returns, making the J shape.



- **Vintage Year**

- The year in which the first influx of investment capital is delivered to a project or company. Investors can use the vintage year of an investment to further explain its returns.

PRIVATE EQUITY: BUILDING BLOCKS (5-7 YEARS)



Source: NEPC

*Private Equity is a derived composite of 34% US Buyout, 34% US Growth, 8.5% US Secondary, 8.5% US Venture, 15% Non-US PE



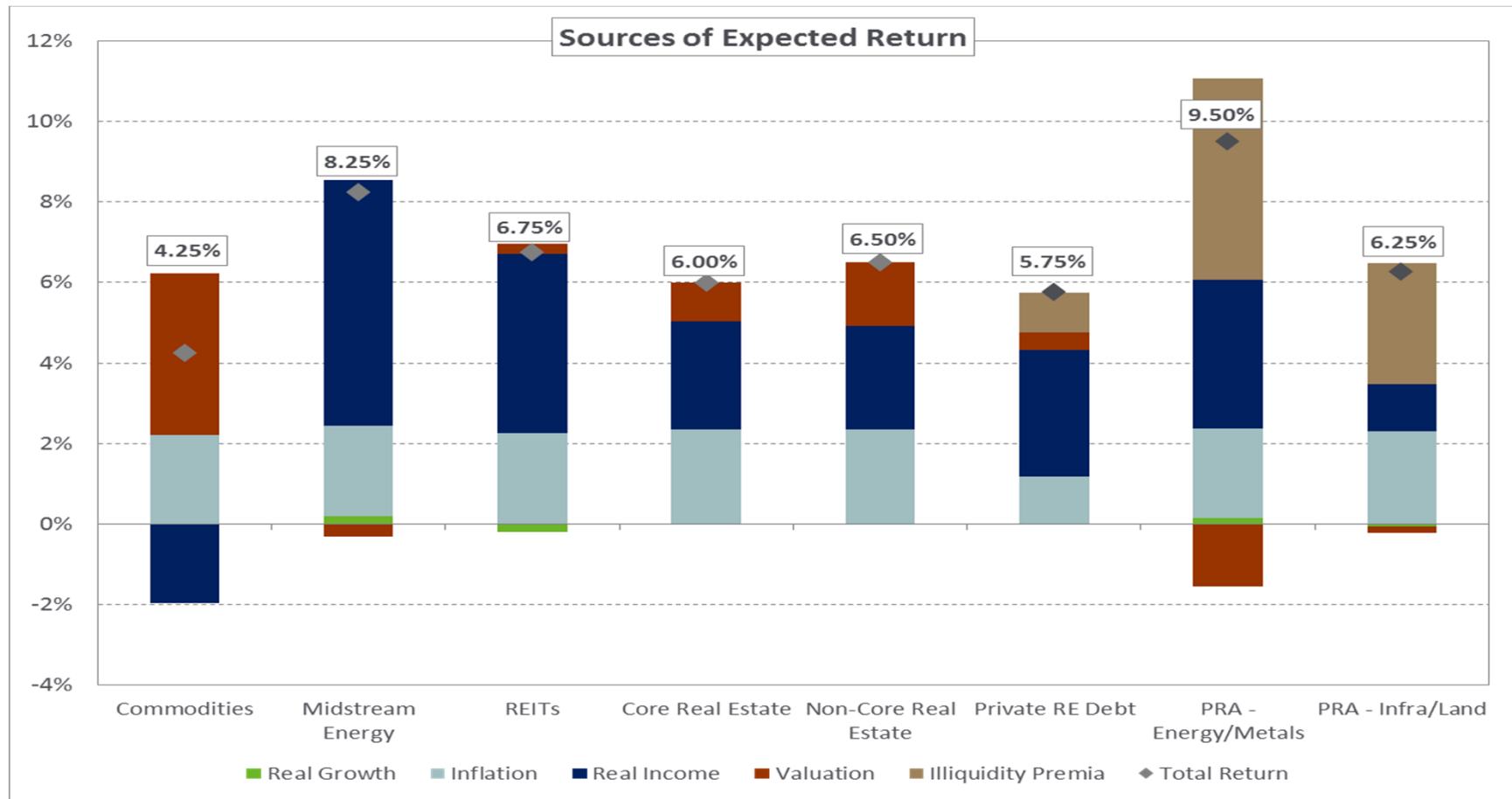
REAL ASSETS: ASSUMPTIONS

Real Assets Building Blocks	
Illiquidity Premium	The additional return expected for investments carrying liquidity risk
Valuation	The expected change in price of the underlying asset reverting to a long-term real average or terminal value assumption
Inflation	Incorporates the inflation paths as defined by TIPS breakeven expectations and NEPC expected inflation assumptions
Real Earnings Growth	Reflects market-specific real growth for each equity asset class as a weighted-average derived from index country revenue contribution and forecasted GDP growth
Real Income	Represents the inflation-adjusted income produced by the underlying tangible or physical asset

Asset Class	5-7 Year Return	Change 2019-2018
Commodities	4.25%	-0.50%
Midstream Energy	8.25%	+1.00%
REITs	6.75%	+0.25%
Core Real Estate	6.00%	+0.25%
Non-Core Real Estate	7.00%	-
Private RE Debt	5.75%	N/A
Private Real Assets: Energy/Metals	9.50%	+1.50%
Private Real Assets: Infrastructure/Land	6.25%	+0.25%



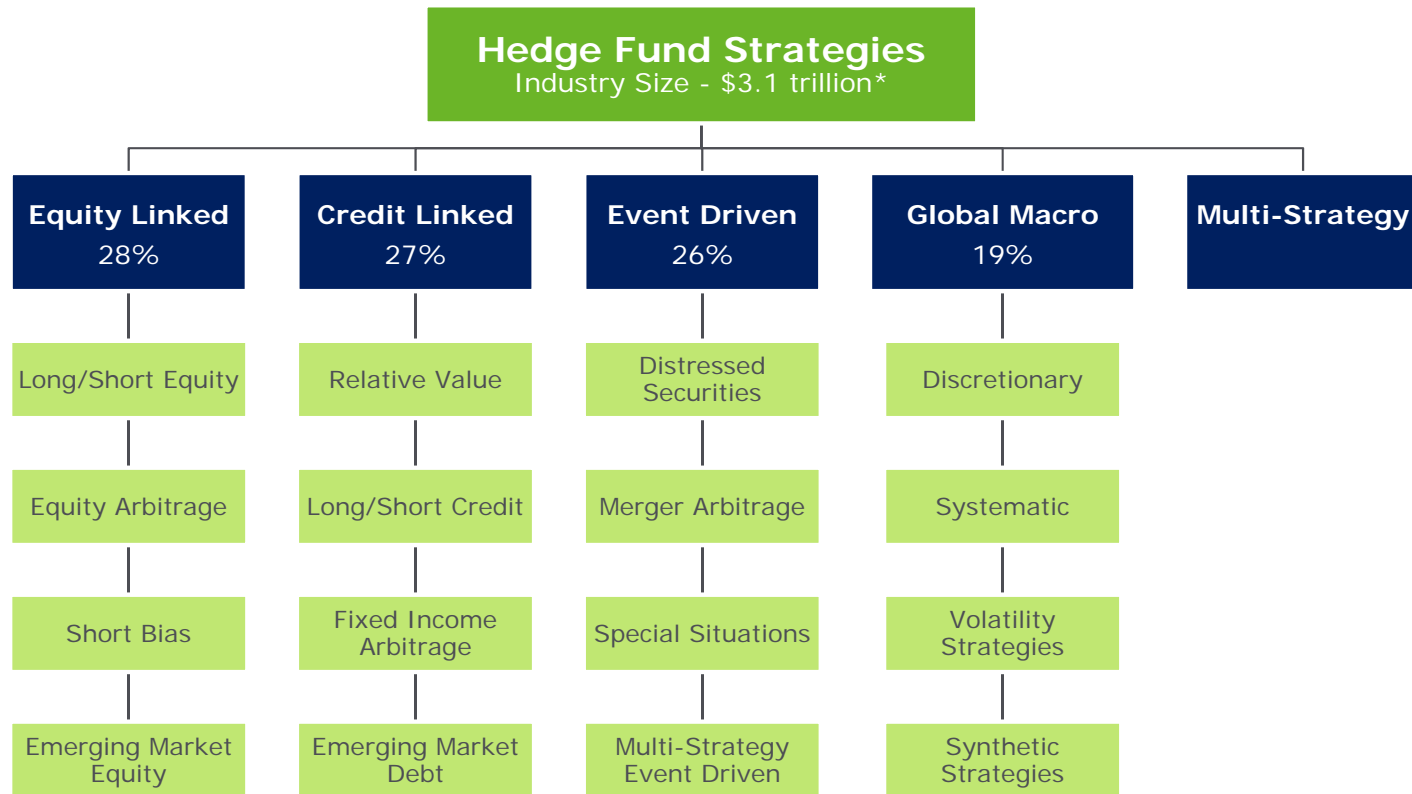
REAL ASSETS: BUILDING BLOCKS (5-7 YEARS)



Source: NEPC



HEDGE FUND INDUSTRY COMPOSITION



Source: HFR Industry Report as of 12/31/2018, using NEPC classifications

ALTERNATIVE INVESTMENT DISCLAIMER

It is important that investors understand the following characteristics of non-traditional investment strategies including hedge funds and private equity:

1. Performance can be volatile and investors could lose all or a substantial portion of their investment
2. Leverage and other speculative practices may increase the risk of loss
3. Past performance may be revised due to the revaluation of investments
4. These investments can be illiquid, and investors may be subject to lock-ups or lengthy redemption terms
5. A secondary market may not be available for all funds, and any sales that occur may take place at a discount to value
6. These funds are not subject to the same regulatory requirements as registered investment vehicles
7. Managers may not be required to provide periodic pricing or valuation information to investors
8. These funds may have complex tax structures and delays in distributing important tax information
9. These funds often charge high fees
10. Investment agreements often give the manager authority to trade in securities, markets or currencies that are not within the manager's realm of expertise or contemplated investment strategy



DISCLOSURES

- Prepared exclusively for attendees of the 2019 NCPERS TEDS Conference. Not for redistribution.
- The opinions presented herein represent the good faith views of NEPC as of the date of this presentation and are subject to change at any time.
- The comments provided herein should be considered a general overview and do not constitute investment advice, are not predictive of any future market performance, are not provided as a sales or advertising communication, and do not represent an offer to sell or a solicitation of an offer to buy any security.
- Information used to prepare this report was obtained directly from various external sources. While NEPC has exercised reasonable professional care in preparing this report, we cannot guarantee the accuracy of all source information contained within or the completeness of such information.
- All investments carry some level of risk. Diversification and other asset allocation techniques do not ensure profit or protect against losses.
- NEPC does not generally provide legal, regulatory or tax advice. Please consult your attorney or tax advisor for assistance as needed.
- Past performance is no guarantee of future results.



In the Beginning... Trustee 101

Presented by
Lydia Lee and Peter Borkon

NCPERS UNIVERSITY
Trustee Educational Seminar
May 18, 2019
Austin, TX



We're not in Kansas anymore...

- How did we get here?
 - Statutory/City Ordinance
 - Plan Provisions
 - Election
 - Appointment



Who wants to be a Fiduciary?

What is a fiduciary?

- A legal obligation of one party to act in the best interest of another.

Who is a fiduciary?

- An entity or individual may be a fiduciary either by designation or by function:
- Designation – any person or entity specifically named in the plan or trust document or any person or entity who agrees to be pursuant to contract
- Function – any person, or entity that makes, or has the authority to make discretionary, administrative or investment decisions related to the plan.

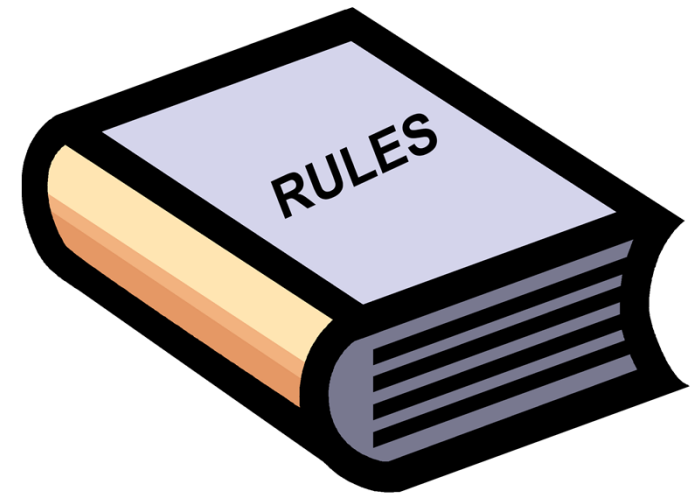
Orientation – Setting Trustees Up for Success

- Establish Routes of communication
- Provide information about Fellow Board Members
- Recognize different backgrounds and experiences
- Written Training Manuals/ Copies of Resource Materials
- Session should include all senior staff members
- Emphasize all of the best practices
- Discussion of Code of Conduct
- Review a Sample Agenda
- Understand/Discuss Responsibilities



Orientation Manual

- Plan Documents/Statutes/Ordinances
 - Written Opinions (Internal Counsel, City Attorney, Internal Legal Counsel, Outside Counsel)
- Administrative Policies
- Actuarial Studies
- Investment Policy
- List of Investment Managers
- List of Outside Consultants



Orientation Discussion

- Communication styles
- Paths for communication
- How to disagree
- Courage to ask questions
- Administrative Hearings
- Disability Determinations
- Legal Precedents (Court cases, AG's opinions, etc.)
- Clarity of roles
- Team development and training

Prior to First Board meeting...

- Complete Orientation
- Review Training Manuals and Resource Materials
- Read all Board Materials Provided
- Create strong policies and procedures
- Recognize different backgrounds and experiences
- Include all senior staff members
- Incorporate and emphasize all of the best practices
- Demonstrate and act as role model for Code of Conduct
- Ask Questions

Plan Documents/Statutes/Ordinances

- Complex but Essential
- Includes Applicable Internal Revenue Code Provisions (Federal Tax Implications)
- Open Meetings/Open Records
- Administrative Policies
- Who Creates
- Who Implements
- How Changed

Actuarial Studies

- How often reviewed/ revised
- How is Actuary Selected
- Consequences of Study
- Impact of Study
 - Disseminated to Members and Beneficiaries
 - Disseminated to Governing/Legislative Body

Investment Policy/ List of Investment Managers

- Asset Allocation & Standards
- How often reviewed/revised
- Consequence of not meeting Policy Guidelines
- Manager Selection Process
- Formal Request for Proposals
- Established Criteria
- Quiet Periods Imposed



Qualities of A Strong Trustee

- Recognize, identify and validate all stake-holders
- Teach by Example/Create atmosphere of trust
- Be a Role-model
- Be inclusive
- Participate - attend
- Disclosures – third party relationships, nepotism, conflict, pay-to-play
- Be innovative - "Don't tell people how to do things, tell them what to do and let them surprise you with their results." George Patton
- Know when to be tough - "The art of leadership is saying no, not yes. It is very easy to say yes." Tony Blair

Effective Board Meetings

- Keep to the Agenda
- Stay Focused
- Maintain Leadership
- Maintain Professionalism
- Manage Conflicts
- Treat all with Courtesy and Respect - Be inclusive
- Ensure Due Process
- Properly manage Consent agendas
- Utilize Effective Committee Structure

Reliable Decision Making

- Prepare
 - Identify the goal of the decision or target of the solution
- Investigate
 - In-depth research on issues and factors for solution
- Consider alternatives
 - Critical/Creative thinking
- Implement
 - Apply the decision
- Evaluate
 - Get feedback and learn from the decision

Dedicated Evaluation Process

- Should be constant, consistent and dedicated
- Internal vs. External
- Good Evaluations include:
 - Staff Evaluation
 - Investment Evaluation
 - Policy Evaluation
 - Board Self-evaluation
 - Goal Evaluation



Successful Communication

- External Communication (Who and When)
 - With Stake-holders
 - With Public
 - With Regulators/Officials
- Internal Communications
 - Board
 - Staff



Protective Actions

- Utilize Effective Committees
- Adopt Code of Conduct
- Establish Effective Lines of Communications
- Follow the Process – law, rule, policy
- Research, Ask Questions

Protective Actions (cont.)

- Be Fair and Be Open
- Be Honest about Decision and Process
- Maintain professional relationship
 - With Staff
 - With Consultants/Vendors

Code of Conduct

- Understand Fiduciary Duties
- Understand Statutory Obligations
- Insist on the highest level of conduct from your staff/consultants/vendors
- Insist on the highest level of conduct from your fellow Board members
- No Conflicts
- See something, Say something



Questions?



Presented by:

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GREAT LAKES ADVISORS

THE TIME VALUE OF MONEY

PRESENTED BY:

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2019 Trustee Educational Seminar
May 18 – 19
Austin, TX



DISCUSSION TOPICS



GREAT LAKES ADVISORS
A WINDUST WEALTH MANAGEMENT COMPANY

THE TIME VALUE OF MONEY

This session will explore the eighth wonder of the world, compounding interest, and will seek to help the Trustee understand this concept through the application of 'future value' (accumulation phase) and 'present value' (payment phase) of a simple annuity.



EZ Financial Calculators

Bishnew Incorporated

OPEN



4.1 ★★★★★
17 Ratings

#187
Finance

4+
Age

What's New

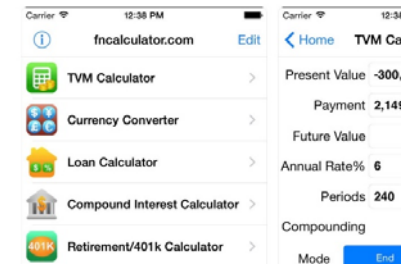
[Version History](#)

Version 6.7.0

2w ago

- Fix currency issue
- Minor enhancements

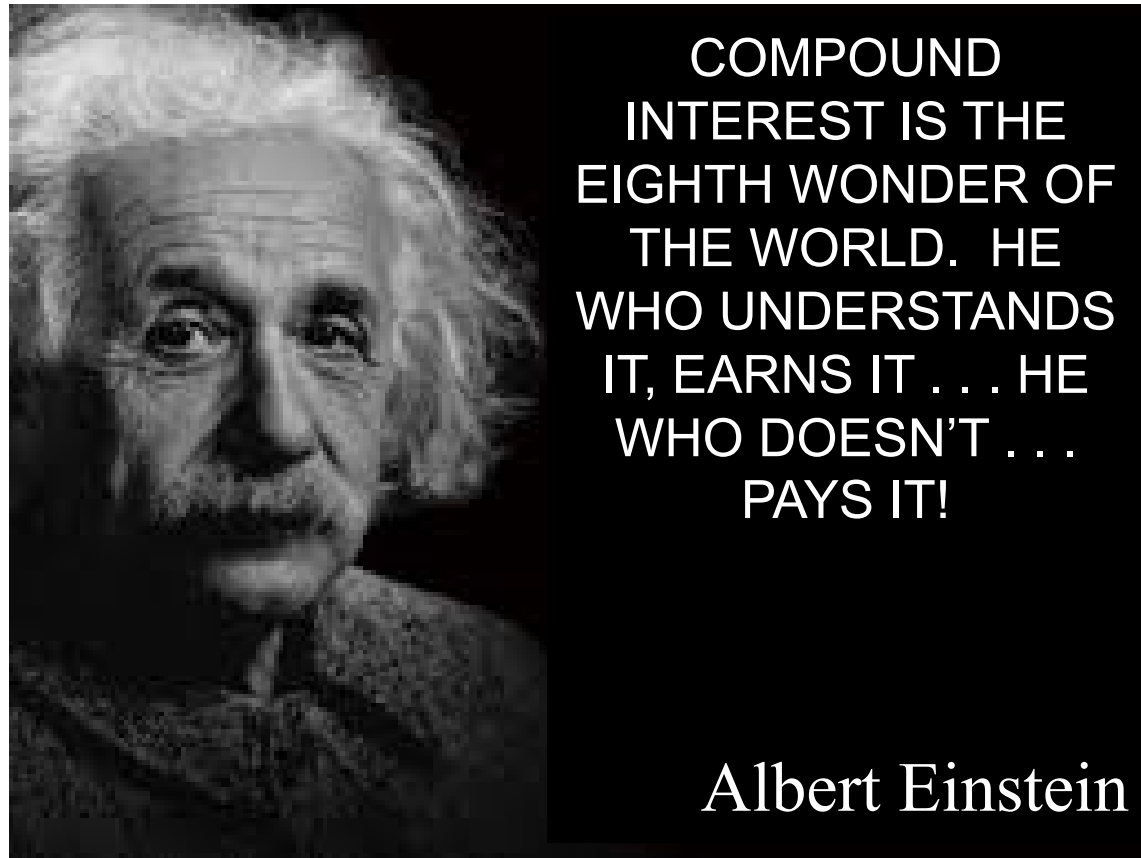
Preview



COMPOUNDING INTEREST



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FUN WITH FINANCE

Cornelius Vanderbilt – Built the ‘Breakers’ as a summer home, he never lived in it. Erected in 1895 at a cost of \$7,450,000. What is the inflation adjusted cost of this home today?

- Solving for FV (Future Value):
 - \$7,450,000 = PV (Present Value)
 - 0 = PMT (Payment)
 - 2.83% = RATE (Annualized Inflation)
 - 122 = NPER (Years)
 - Inflation adjustment made at the end of the Period
 - **\$224,272,612 = FV (Future Value)**

A buyer wants to purchase this home, at its current FV with a 20% down payment and to borrow the balance over a 30 year mortgage at 4.25%. What is the monthly payment?

- Solving for PMT (Payment):
 - 20% Down = \$44,854,522
 - \$179,418,088 (Mortgage Amount) = PV
 - \$0 = FV (Loan will be paid in full)
 - 4.25% = RATE (APR)
 - 360 = NPER (Months 30 x 12)
 - Payments made at the end of the Period
 - **\$882,629 = Monthly Payment**

Total Loan Cost
\$318M



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< Home TVM Calculator Advanced

Present Value 7,450,000

Payment 0

Future Value -224,272,611...

Annual Rate% 2.83

Periods 122

Compounding

Mode

Decimal

Note: Enter the known values and click the Button on the right to calculate the corresponding unknown value.

< Home TVM Calculator Advanced

Present Value 179,418,088

Payment -882,629.15

Future Value 0

Annual Rate% 4.25

Periods 360

Compounding

Mode

Decimal

Note: Enter the known values and click the Button on the right to calculate the corresponding unknown value.



Used for illustrative purposes only and may vary based on circumstances.

FUN WITH FINANCE

Hypothetical Thirty Year Treasury Bond

- \$1,000,000 PAR -10% Coupon - Issued Winter - 1982
- Price in Winter 1984 when current yields were **11.7%**
 - Solving for Current Price (PV):
 - 11.7% = Rate
 - \$1,000,000 = FV
 - \$100,000 = Annual Coupon
 - 28 = Years Remaining
 - Payments made at the end of the Period
 - **\$861,259 = Current Price (PV)**
 - Bond is trading at a **Discount** – LESS THAN PAR
- Price in Winter 1986 when current yields were **7.4%**
 - Solving for Current Price (PV):
 - 7.4% = Rate
 - \$1,000,000 = FV
 - \$100,000 = Annual Coupon
 - 26 = Years Remaining
 - Payments made at the end of the Period
 - **\$1,296,444 = Current Price (PV)**
 - Bond is trading at a **Premium** – MORE THAN PAR



Used for illustrative purposes only and may vary based on circumstances.



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< Home TVM Calculator Advanced

Present Value **-861,258.9** PV

Payment 100,000 PMT

Future Value 1,000,000 FV

Annual Rate% 11.7 Rate

Periods 28 Periods

Compounding Annually

Mode End Beginning

Decimal Two Three Four

Instruction Reset Email

Note: Enter the known values and click the Button on the right to calculate the corresponding unknown value.

< Home TVM Calculator Advanced

Present Value **-1,296,444.02** PV

Payment 100,000 PMT

Future Value 1,000,000 FV

Annual Rate% 7.4 Rate

Periods 26 Periods

Compounding Annually

Mode End Beginning

Decimal Two Three Four

Instruction Reset Email

Note: Enter the known values and click the Button on the right to calculate the corresponding unknown value.

FUN WITH FINANCE

What about Apple (AAPL)?

- Solving for RATE:
 - \$.51 = PV (Price 12/12/1980)
 - \$169.10 = FV (Price adjusted for Splits and Dividends on 12/12/2018)
 - 0 = Payment - Dividends re-invested
 - 37 = Years
 - Payments made at the beginning of the Period
 - **16.98% = RATE (Annualized Return)**

Was IBM a good investment?

- Solving for RATE:
 - \$16.44 = PV (Price 12/12/1980)
 - \$121.16 = FV (Price Adjusted for Splits and Dividends on 12/12/2018)
 - 0 = Payment - Dividends re-invested
 - 37 = Years
 - Payments made at the beginning of the Period
 - **5.55% = RATE (Annualized Return)**



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[Home](#) TVM Calculator [Advanced ?](#)

Present Value [PV](#)

Payment [PMT](#)

Future Value [FV](#)

Annual Rate% [Rate](#)

Periods [Periods](#)

Compounding [Annually](#)

Mode End Beginning

Decimal Two Three Four Five

[Instruction](#) [Reset](#) [Email](#)

Note: Enter the known values and click the Button on the right to calculate the corresponding unknown value.

[Home](#) TVM Calculator [Advanced ?](#)

Present Value [PV](#)

Payment [PMT](#)

Future Value [FV](#)

Annual Rate% [Rate](#)

Periods [Periods](#)

Compounding [Annually](#)

Mode End Beginning

Decimal Two Three Four Five

[Instruction](#) [Reset](#) [Email](#)

Note: Enter the known values and click the Button on the right to calculate the corresponding unknown value.



Used for illustrative purposes only and may vary based on circumstances.

19-1-0024

FUN WITH FINANCE



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NEED MONEY FAST?
Compare our rates and terms to a payday loan, you'll be SHOCKED!

APPROXIMATE PAYMENT --TOTAL INSTALLMENT**

EXAMPLE LOAN SCHEDULE	Weekly Term: 38	Bi-Weekly Term: 36	Semi-Monthly Term: 20	Monthly Term: 10
\$500	\$18.61	\$37.45	\$37.20	\$75.36
\$1000	\$37.21	\$74.90	\$74.40	\$150.71

**Our installment loans are based on a 99% APR. Loan amounts and requirements subject to change. Restrictions may apply.

You will be shocked, a 99% Annual Interest Rate!

< Home TVM Calculator Advanced

Present Value

Payment

Future Value

Annual Rate%

Periods

Compounding

Mode

Decimal

Note: Enter the known values and click the Button on the right to calculate the corresponding unknown value.

In 1984, NY Detective Robert Cunningham was at Sal's Pizzeria near Yonkers when he made a deal with his server Phyllis Penzo, that instead of a tip they would split a \$1 lottery ticket. They won \$6 million and split \$285,715-a-year for the next 20 years! How much would you need today to cover the payment at a 5% earnings rate?

Solving for PV (Present Value):

- \$0 = FV (Future Value)
- \$285,715 = PMT (Payment)
- 5% = RATE (Annualized)
- 20 = NPER (Periods - Years)
- Earnings at the end of the period
- \$3,560,640 = PV (Present Value)

\$6 million payout

< Home TVM Calculator Advanced

Present Value

Payment

Future Value

Annual Rate%

Periods

Compounding

Mode

Decimal

Note: Enter the known values and click the Button on the right to calculate the corresponding unknown value.



A MILLION DOLLAR WINNER



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YOU WIN THE LOTTERY!!!!



You have two options to receive your \$1,000,000:

- 1) Simple Annuity (Pension)**
A set annual payment for a set number of years into the future, or
- 2) Lump Sum (Present Value)**
a discounted cash payment now.

The Lottery has two ways to provide for the payout:

- 1) Pay As You Go**
Payouts funded from 'Revenue' or,
- 2) Create an 'Asset Pool/Trust'**
funded from actuarial determined payments



Used for illustrative purposes only and may vary based on circumstances.

SIMPLE ANNUITY



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CALCULATING THE \$1,000,000 ANNUITY:

- Solving for a simple annuity:
 - 20 years = Contract Term
 - \$50,000 = Annual Payment
- **Cash received by the winner over the contract term \$1,000,000**



Used for illustrative purposes only and may vary based on circumstances.

LUMP SUM



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CALCULATING THE LUMP SUM OR PRESENT VALUE:*

- Solving for Present Value (PV):
 - \$50,000 = PMT (Annual Payment)
 - \$0 = FV (Future Value)
 - 7% = RATE (Discount Rate)
 - 20 years = NPER (Number of Periods)
 - Payment at the beginning of the period
- Cash lump sum amount (PV) = \$566,780

***Present Value is the current worth of a stream of cash flows at a specified rate of return.**

[Home](#) TVM Calculator **Advanced**

Present Value	<input type="text" value="-566,779.76"/>	PV
Payment	<input type="text" value="50,000"/>	PMT
Future Value	<input type="text" value="0"/>	FV
Annual Rate%	<input type="text" value="7"/>	Rate
Periods	<input type="text" value="20"/>	Periods

Compounding **Annually**

Mode	<input type="button" value="End"/>	<input checked="" type="button" value="Beginning"/>	
Decimal	<input checked="" type="button" value="Two"/>	<input type="button" value="Three"/>	<input type="button" value="Four"/>

[Instruction](#) [Reset](#) [Email](#)

Note: Enter the known values and click the Button on the right to calculate the corresponding unknown value.



Used for illustrative purposes only and may vary based on circumstances.

19-1-0024

CREATE AN ASSET POOL/TRUST

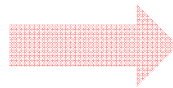


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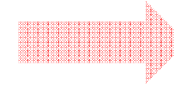
ASSET POOL (PENSION FUND) REQUIRES:

- **Current Assets** - Net Present Value (NPV)
- **Systematic Contributions** – Payment (PMT)
- **Expected Liability** - Future Value (FV)
- Expected Rate of Return or **Discount Rate** (RATE)
- **Time Estimate** – Periods (NPER)

ACCUMULATION PHASE - 20 YEARS (EXAMPLE)



PAYMENT PHASE - 20 YEARS (EXAMPLE)



Used for illustrative purposes only and may vary based on circumstances.

ACCUMULATION PHASE

CONTRIBUTIONS REQUIRED TO FUND THE POOL:

- Solving for the required annual (Payment):
 - **\$566,779 = FV** (Future Liability)
 - \$0 Beginning Value = PV
 - 7% = RATE (Discount Rate)
 - 20 Years = NPER (Years)
 - Payment made at the end of the Period
 - **Annual payment = \$13,825**
 - $20 * \$13,825 = \$276,508$ or 49%



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[Home](#) TVM Calculator [Advanced](#)

Present Value	0	PV
Payment	-13,825.42	PMT
Future Value	566,779.76	FV
Annual Rate%	7	Rate
Periods	20	Periods

Compounding **Annually**

Mode **End** Beginning

Decimal **Two** Three Four

[Instruction](#) [Reset](#) [Email](#)

Note: Enter the known values and click the Button on the right to calculate the corresponding unknown value.



Used for illustrative purposes only and may vary based on circumstances.

19-1-0024

PAYMENT PHASE



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APPLICATION TO A PENSION ANNUITY:

- A normal retirement with no survivors
 - Final Average Pay = \$83,334
 - Creditable Service = 20 Years
 - Creditable Service Formula = 3%
 - Retirement @ 54 – Death @ 74 years = 20 Years
 - **Pension Annuity = \$83,334 x 60% = \$50,000**
- Solving for the amount to fund the benefit (PV):
 - \$50,000 = PMT (Pension Annuity Amount)
 - \$0 = FV (Value at Death)
 - 7% = RATE (Actuarial Rate of Return)
 - 20 years = NPER (Life Expectancy)
 - Payment at Beginning of the period
 - **Actuarial Equivalent Liability = \$566,780 (PV)**

- **8% Actuarial Rate of Return requires a PV of \$530,180 – LESS**
- **6% Actuarial Rate of Return requires a PV of \$607,906 - MORE**



Used for illustrative purposes only and may vary based on circumstances.

EXPECTED COST



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ACCUMULATION PHASE

- **Annual required contribution = \$13,825.42**
 - 20 Years * \$13,825.42 = \$276,508

PAYMENT PHASE

- \$566,780 = Annuity Present Value
- 20 Years = Life Expectancy
- Retirement Annuity = 20 Years of \$50,000

EXPECTED COST

- **FUNDING - 20 Years of Inflow * \$13,825.42 = \$276,508**
- **PAYMENT - 20 Years of Outflow = \$1,000,000**
 - **\$1,000,000 - \$276,508 = \$723,492**
 - **40 Year Earnings Attribution - 72%**

THE MIRACLE OF COMPOUNDING INTEREST!



Used for illustrative purposes only and may vary based on circumstances.

APPLICATIONS FROM EVOLUTION



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- “Currently, almost everyone 50 and older can contribute up to \$7,000 a year to an IRA, and \$25,000 a year to a 401(k). Max out the former for 10 years, and you'll wind up with about \$97,000, maxing out a 401(k) for 10 years will yield much more impressive results -- \$345,000, all other things being equal.”

< Home TVM Calculator [Advanced](#) ?

Present Value	0	PV
Payment	-7,000	PMT
Future Value	97,000	FV
Annual Rate%	7.06	Rate
Periods	10	Periods

Compounding **Annually**

Mode **End** Beginning

Decimal **Two** Three Four Five

[Instruction](#) [Reset](#) [Email](#)

Note: Enter the known values and click the Button on the right to calculate the corresponding unknown value.

< Home TVM Calculator [Advanced](#) ?

Present Value	0	PV
Payment	-25,000	PMT
Future Value	345,411.20	FV
Annual Rate%	7	Rate
Periods	10	Periods

Compounding **Annually**

Mode **End** Beginning

Decimal **Two** Three Four Five

[Instruction](#) [Reset](#) [Email](#)

Note: Enter the known values and click the Button on the right to calculate the corresponding unknown value.



Source: The Motley Fool

APPLICATIONS FROM EVOLUTION



- The median 401(k) account value for an investor age 65 and older is a measly \$58,035 (Vanguard).

< Home TVM Calculator Advanced ?

Present Value	345,411.20	PV
Payment	-32,604.37	PMT
Future Value	0	FV
Annual Rate%	7	Rate
Periods	20	Periods
Compounding	Annually	
Mode	End Beginning	
Decimal	Two Three Four Five	
Instruction Reset Email		

Note: Enter the known values and click the Button on the right to calculate the corresponding unknown value.

< Home TVM Calculator Advanced ?

Present Value	97,000	PV
Payment	-9,156.11	PMT
Future Value	0	FV
Annual Rate%	7	Rate
Periods	20	Periods
Compounding	Annually	
Mode	End Beginning	
Decimal	Two Three Four Five	
Instruction Reset Email		

Note: Enter the known values and click the Button on the right to calculate the corresponding unknown value.

< Home TVM Calculator Advanced ?

Present Value	58,035	PV
Payment	-5,478.09	PMT
Future Value	0	FV
Annual Rate%	7	Rate
Periods	20	Periods
Compounding	Annually	
Mode	End Beginning	
Decimal	Two Three Four Five	
Instruction Reset Email		

Note: Enter the known values and click the Button on the right to calculate the corresponding unknown value.



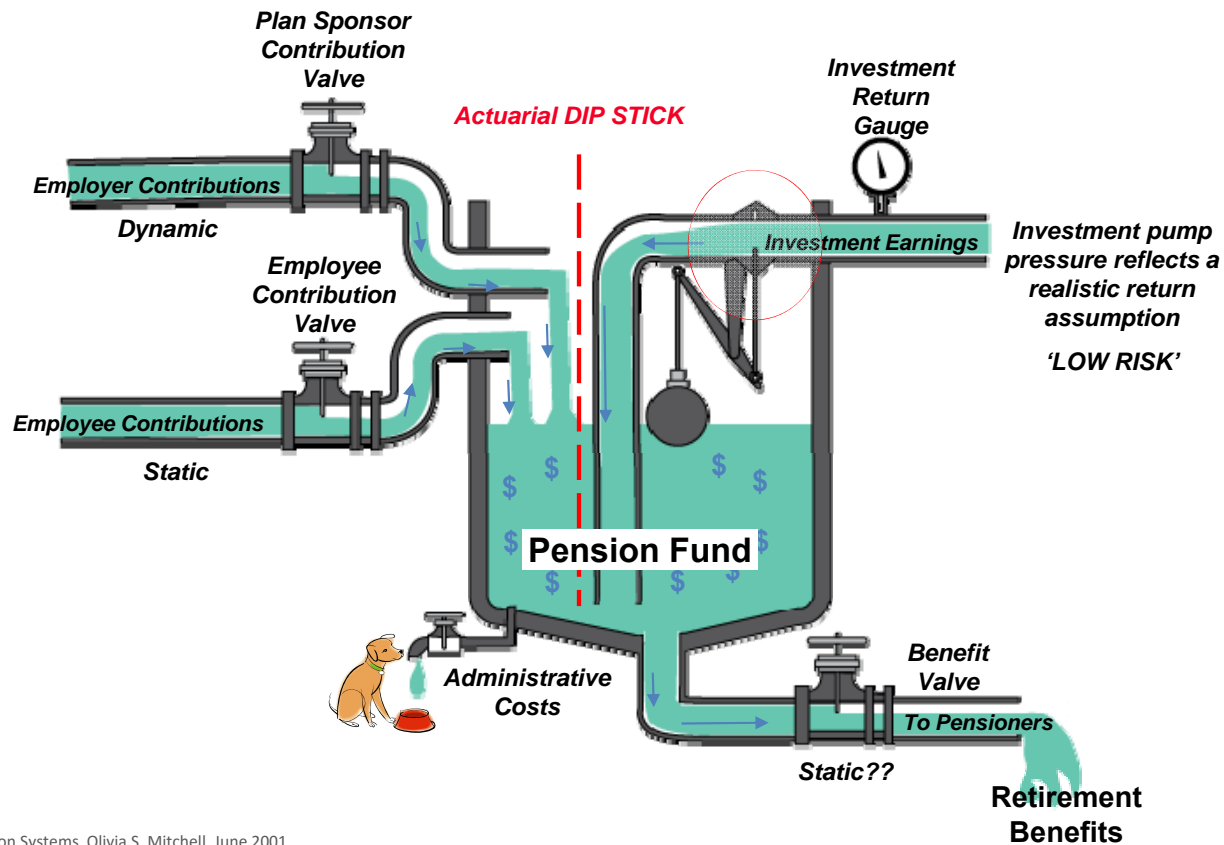
Source: Vanguard

ILLUSTRATION – DEFINED BENEFIT PLAN



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PROPERLY FUNDED DEFINED BENEFIT PLAN ILLUSTRATION



Source: The ABC's of Pension Systems, Olivia S. Mitchell. June 2001

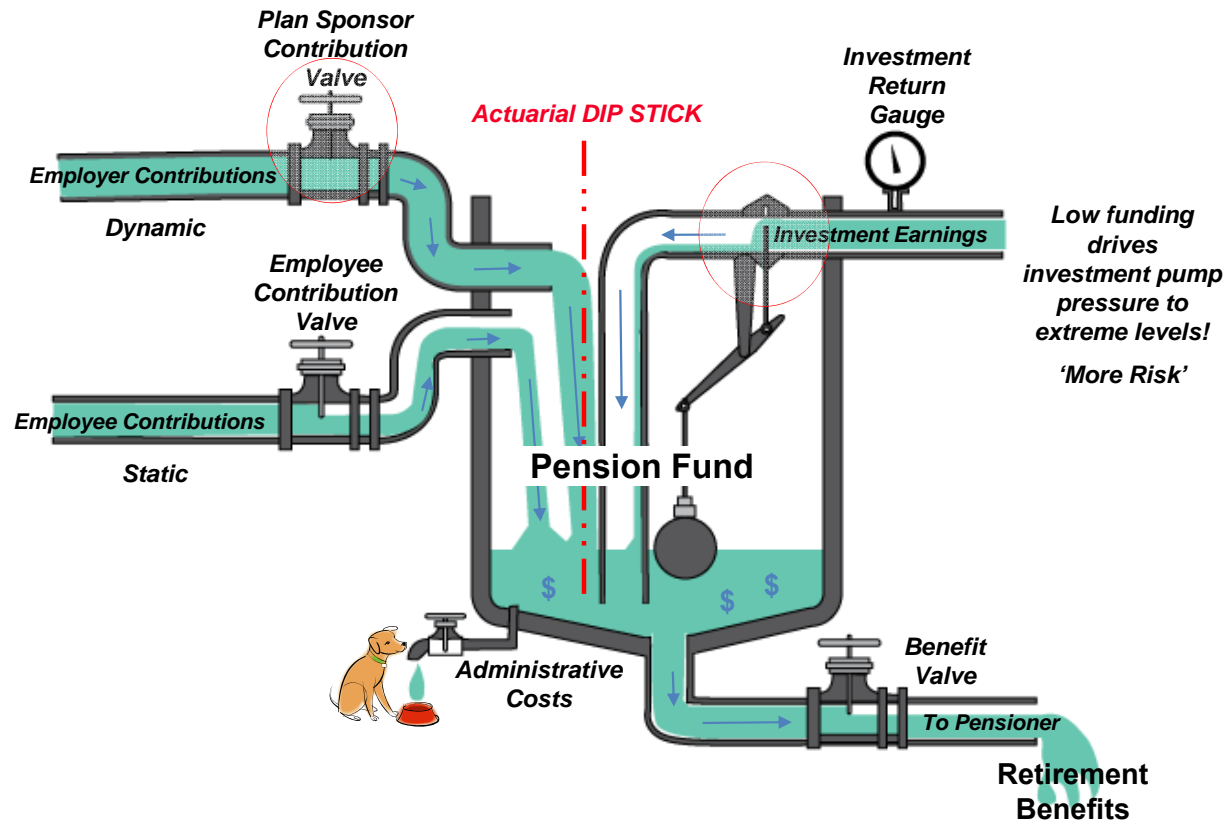
19-1-0024

ILLUSTRATION – DEFINED BENEFIT PLAN



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UNDER-FUNDED DEFINED BENEFIT PLAN ILLUSTRATION



Source: The ABC's of Pension Systems, Olivia S. Mitchell. June 2001

19-1-0024

A FUNDING REALITY



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REDUCE OUTFLOWS

- **Employer**
 - Seek legislative relief on benefit structures
 - Diminish Collective Bargaining Rights
 - Reduce salary
 - Provide benefits to less people (layoffs)
 - Freeze Plan/Liability
- **System**
 - Redefine variable salary supplements (spikes)
 - Reduce/limit inflation protection (Cost of Living Increases)
 - Define work-related disabilities and survivor benefits more rigorously
 - Consolidate to reduce expenses
- **Employee**
 - Accept benefit reductions
 - Accept Tiering for new employees
 - Higher hurdle for future benefit enhancements



A FUNDING REALITY



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INCREASE INFLOWS

- Employer
 - Increase tax rate
 - Increase tax base
- System
 - Increase investment return
 - Increase risk
- Employee
 - Increase contributions

ACTUARIAL & ACCOUNTING CHANGES (New Dip Stick)

- 'Mark to Market'
- Discount Rate Changes (GASB 67/68)
- Smoothing
- 'Market Value Liability'

JUDICIAL & LEGAL CHALLENGES

- Constitutional Protection
- Municipal Bankruptcy
- Sovereign Bankruptcy



BIOGRAPHY



Kelly Weller

Managing Director

Kelly Weller is a Managing Director of Client Service and Sales for Great Lakes Advisors and serves as a client relationship manager for the firm. Kelly began his industry career in 1994 and specializes in investment solutions for public, non-profit, corporate, and multi-employer endowment, foundation and retirement plans.

Prior to joining the firm in 2012, he held similar positions with PNC Capital Advisors, LLC and JP Morgan Asset Management Company. As a former firefighter, public fund trustee and current Board Advisor to the National Conference on Public Employee Retirement Systems, Kelly brings a deep relationship network and practical experience to the client service team.

Kelly holds a bachelor's degree from Illinois College, an MBA from the University of Illinois (Springfield), and is also a Certified Public Accountant. He also holds FINRA Series 7, 63, and 65 Licenses.

ABOUT GREAT LAKES ADVISORS

Founded in 1981, Great Lakes Advisors is headquartered in Chicago, Illinois with an additional office in Tampa, Florida. The firm has \$9.3 billion in assets under management and advisement and offers a wide range of fixed income and equity strategies across all market capitalizations. We have deep portfolio management capabilities within ESG, Socially Responsible, Tax-Managed, and Customized account solutions. Our clients include public funds, multi-employer plans, corporations, religious communities, endowments/foundations, health care plans, and private wealth management clients. Great Lakes Advisors certifies compliance with the NCPERS Code of Conduct.



DISCLOSURES



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Great Lakes Advisors, LLC (“Great Lakes” or “GLA”) is an investment advisor registered with the Securities and Exchange Commission under the Investment Advisors Act of 1940. Established in 1981, Great Lakes is a subsidiary of Wintrust Financial Corporation and a part of the Wintrust Wealth Management family of companies. On October 1, 2013, majority owned subsidiary Advanced Investment Partners, LLC (“AIP”) became fully-owned and integrated into Great Lakes. Great Lakes is a distinct business unit with distinct investment processes and procedures relating to the management and/or trading of investment portfolios for its clients.

Great Lakes Advisors, LLC claims compliance with the Global Investment Performance Standards (GIPS®). A complete list of firm composites and performance results, and the policies for valuing portfolios, calculating performance, and preparing GIPS compliant presentations are available upon request by calling 312-553-3700.



2019 Trustee Educational Seminar (TEDS)

A Pension Trustee's Guide to the Actuarial Valuation

Pam Feely, CPA, MBA, AF

Leslie Thompson FSA, FCA, EA, MAAA

May 19, 2019

NCPERS UNIVERSITY
Trustee Educational Seminar
May 18 - 19
Austin, TX



Today's Agenda

- Introduction-Defined Benefit Plans
- Actuarial Valuation
- Actuarial Assumptions
- Data, Assets
- Normal Cost, Accrued Liability
- Policy Considerations
- Decision Making
- With Trustee Comments Throughout
- **Now, let's get back to the basics!**

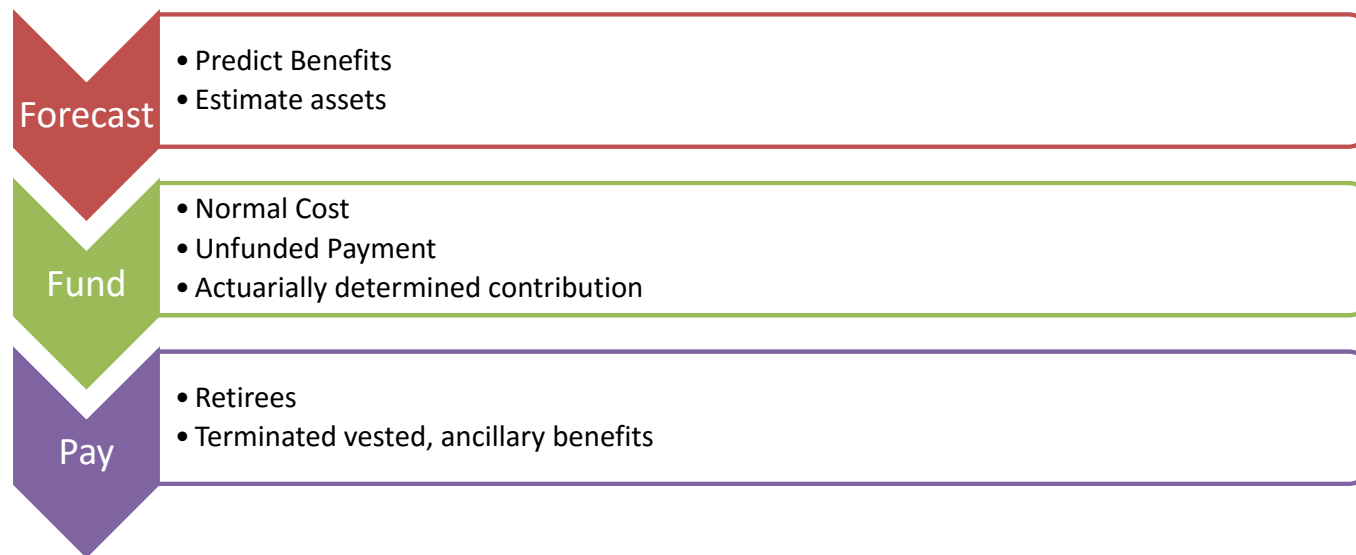


Introduction

The Defined Benefit Pension Plan

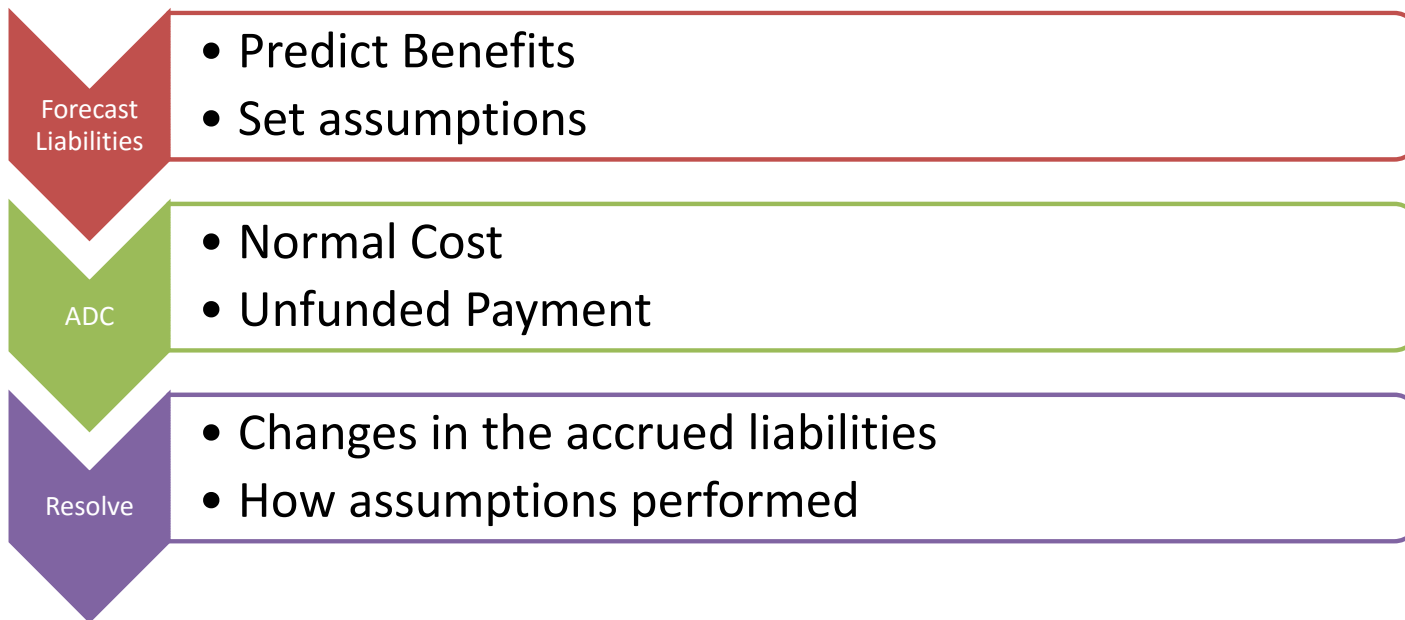
Defines a Benefit *(then determines contribution)**

**for reverse order, see a defined contribution plan*



Introduction

The Purpose of the Actuarial Valuation



The Actuarially Determined Contribution

Actuarial Assumptions- Inflation and the Rate of Return

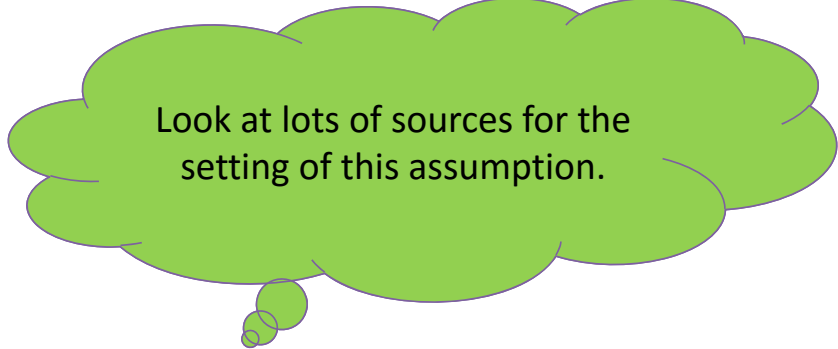
What portion of future benefits will be paid by assets?



The Actuarially Determined Contribution

Actuarial Assumptions-Inflation

- Inflation (price)
 - All experience inflation
 - CPI-U history
 - Bond market prediction
 - Social Security's prediction
 - Fed policy



Look at lots of sources for the setting of this assumption.

The Actuarially Determined Contribution

Actuarial Assumptions-Inflation and CPI-U

- What is the CPI-U really?



England has gin; US has
vodka in the basket of
goods

The Actuarially Determined Contribution

Actuarial Assumptions- Investment Return

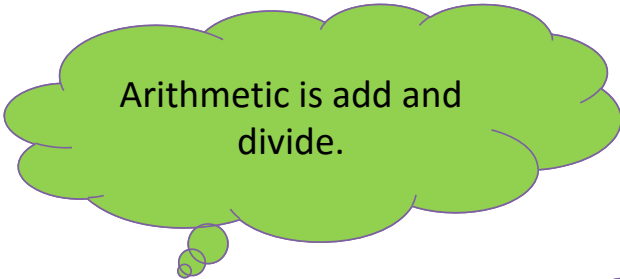
- Investment return assumption
 - Your history
 - Other's history (survey)
 - Expenses paid from returns
 - Your asset allocation
 - Arithmetic return (a higher estimate)
 - Geometric return (incorporates volatility)



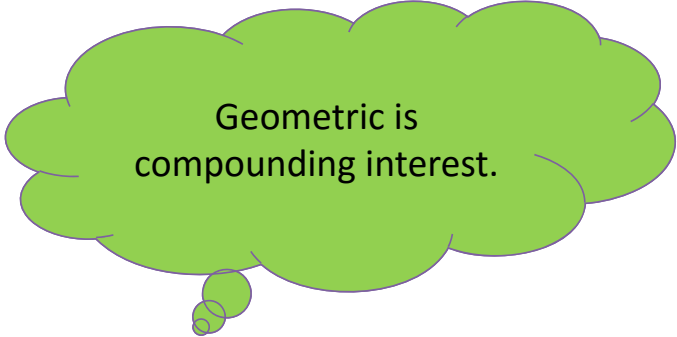
The Actuarially Determined Contribution

Actuarial Assumptions-Arithmetic and Geometric returns

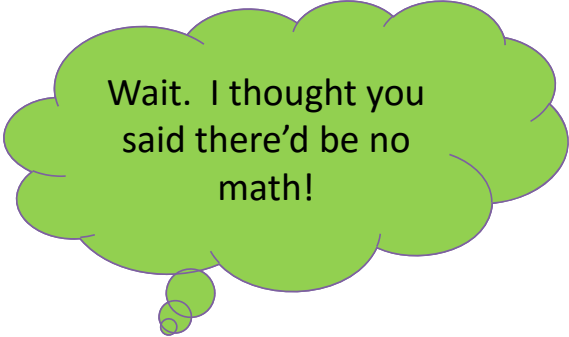
- Arithmetic vs. Geometric



Arithmetic is add and divide.



Geometric is compounding interest.



Wait. I thought you said there'd be no math!

The Actuarially Determined Contribution

Actuarial Assumptions-Volatility Cost

- The “volatility” cost – arithmetic vs. geometric
- The greater the volatility the greater the cost
- That is why we look at the geometric return
 - *These are volatile times*

This really means the greater the volatility the lower your actual rate of return. Then the higher the contributions.

Trustee Comments

- How does our inflation assumption, real and nominal rate of return compare to others?
- How do these items compare to what our investment consultant is reporting?
- How do we handle expenses in this assumption?
- In what ways do you (actuary) see risk in this assumption?
- Do you expect this assumption to change soon?
- How volatile is our portfolio and what do we do to manage its volatility?



The Actuarially Determined Contribution

Actuarial Assumptions-Salary Increases

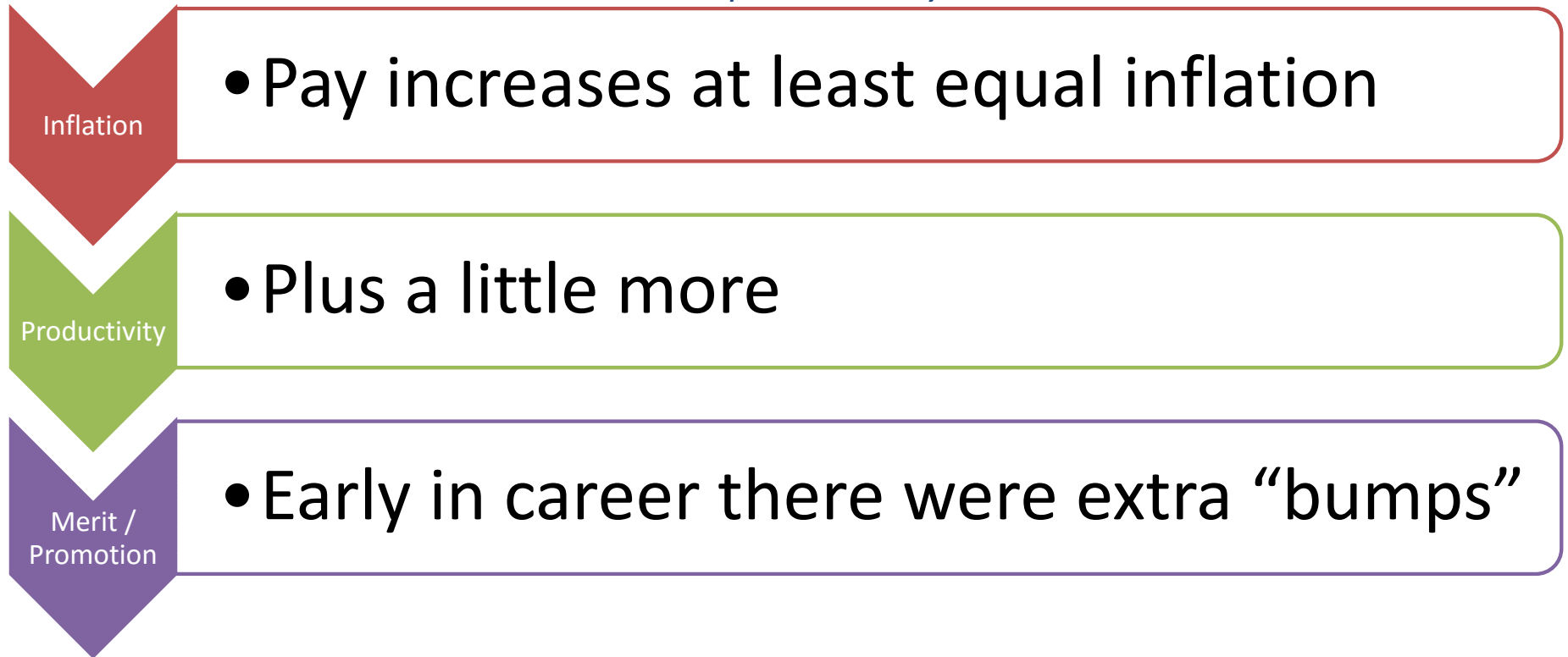
- Salary increase assumptions-what happens to an individual's pay?

Forecast
Benefits

- Estimate each member's future pay
- And service

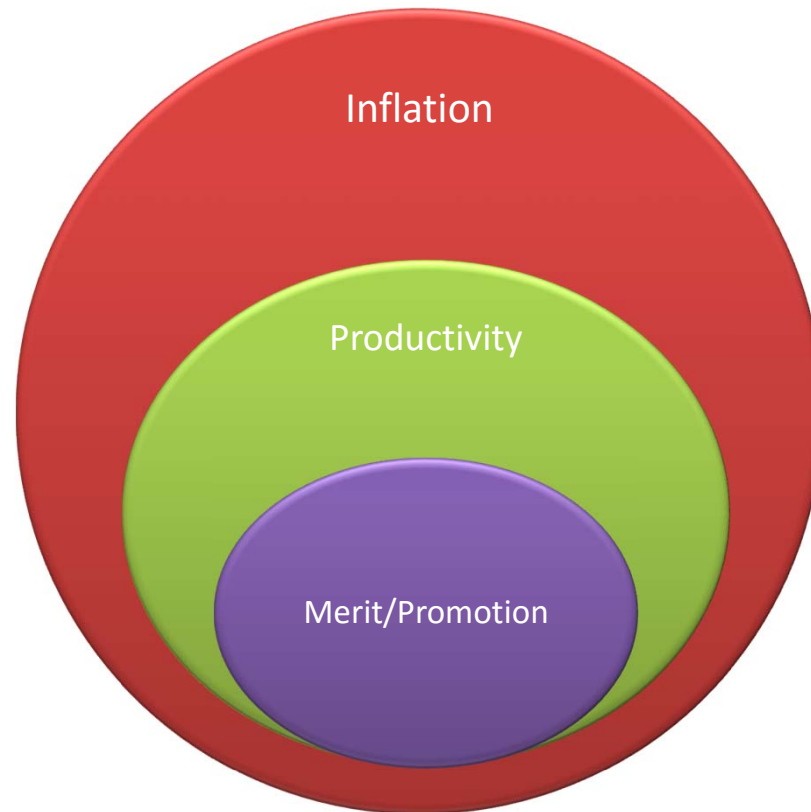
The Actuarially Determined Contribution

Actuarial Assumptions-Salary Increases



The Actuarially Determined Contribution

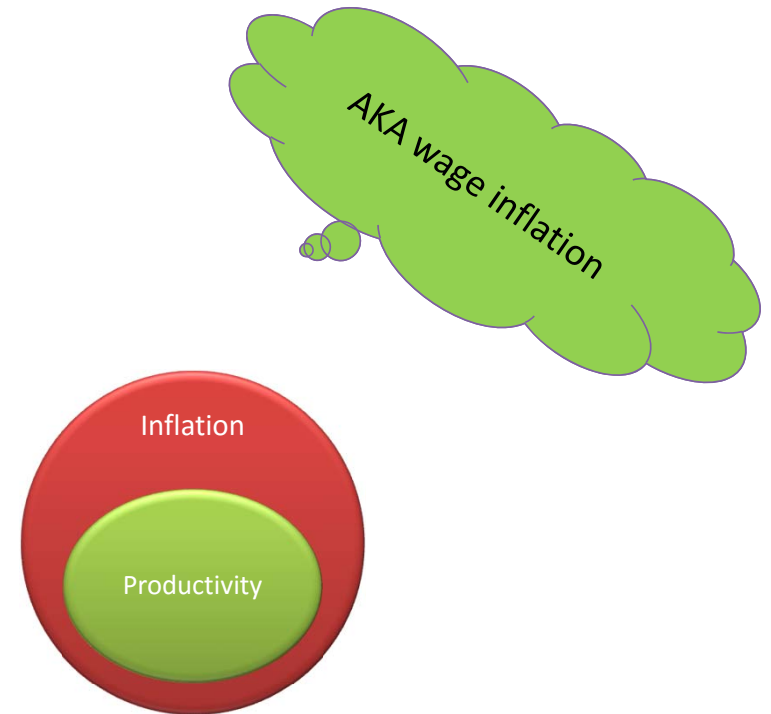
Actuarial Assumptions- Individual salary increase components



The Actuarially Determined Contribution

Payroll growth

- Total payroll
- “Engine” for contributions
- Budget usually as a percent of payroll
- Payroll changes with changing population
- Generally equal to the sum of inflation plus productivity



The Actuarially Determined Contribution

Payroll Growth Assumption and Affect on Amortization

Amortization Payments Example	"NO" Payroll Growth Assumed	Payroll Growth Assumed at 2.75%
First year payment	\$94,393	\$76,147
Second year payment	\$94,393	\$78,241
You get the picture...		

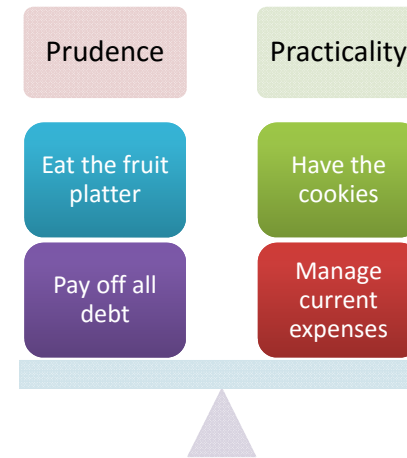
The Actuarially Determined Contribution

Payroll Growth

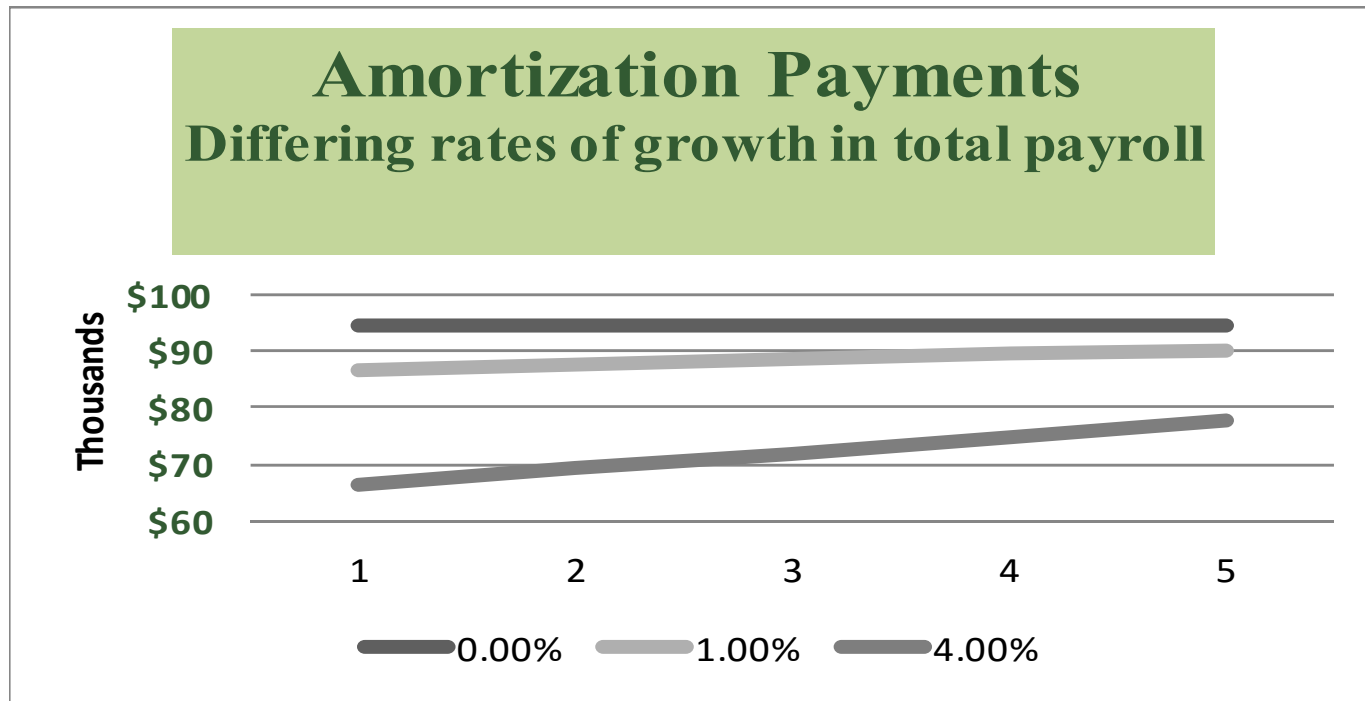
- What's the real issue?
- The paying off of the unfunded accrued liability

Watch for negative amortization

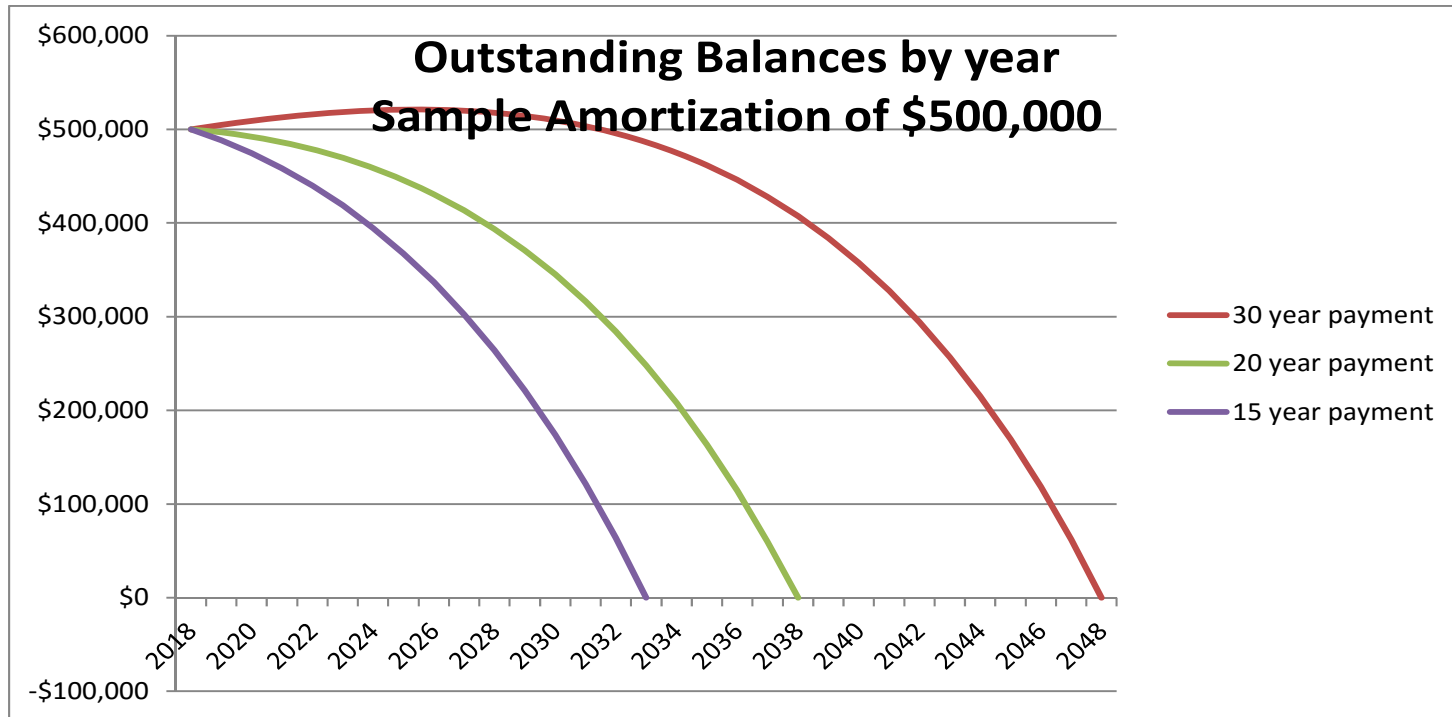
- This is all a balance between prudence and practicality.



Payroll Growth and the Annual Payments on the UAL



Sample Negative Amortization



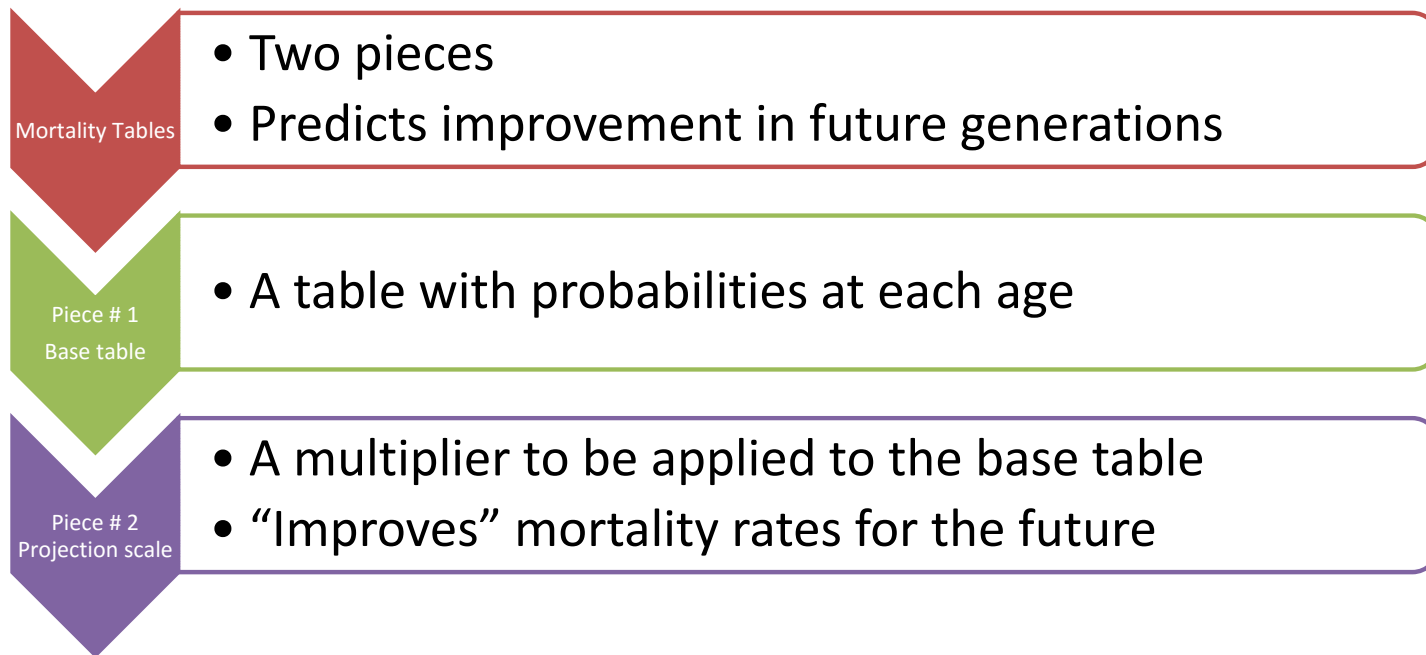
Trustee Comments

- How did the salary increases compare to the assumptions?
- Did you see anything unusual in the salary increases?
- How did payroll growth compare to the assumption?
- Did the plan experience negative amortization?
- How do our salary and payroll assumptions compare to others?
- Does our salary and payroll growth assumptions tie into our HR strategies?



The Actuarially Determined Contribution

Actuarial Assumptions-Mortality and Life Expectancy



The Actuarially Determined Contribution

Mortality

- How actuaries look at mortality rates



The Actuarially Determined Contribution

Mortality

- How actuaries look at mortality rates

Post-Retirement Mortality (non-disabled) – Males RP-2000 White Collar with Generational Improvements					
Age	Based on last 5 years			Based on a new table	
	Actual deaths	Expected deaths (from mortality table)	A/E ratio	Expected deaths (from new mortality table)	Actual Deaths to Expected Deaths (A/E) ratio
50 - 54	0	0.3	0.00%	0.3	0.00%
55 - 59	2	1.5	133.33%	1.4	142.86%
60 - 64	3	6	50.00%	5.5	54.55%
65 - 69	9	12.1	74.38%	6	150.00%
70 - 74	11	9.8	112.24%	9	122.22%
75 - 79	5	10.6	47.17%	7	71.43%
80 - 84	9	15.6	57.69%	8	112.50%
85 - 89	12	14.1	85.11%	10	120.00%
90 and over	8	11.6	68.97%	11	72.73%
Totals	59	81.6	72.30%	58.2	101.37%

** Assumed based on the same group of exposures and actual deaths*

Trustee Comments

- How did our population's mortality compare to the assumptions?
- Are we on a most recent table?
- Do you expect changes in this assumption?
- How influential is this assumption in the development of the contribution rate?
- The news says life expectancy is declining in the U.S. Is it doing so in our plan?



The Actuarially Determined Contribution

Participant Data

- Look at data in its entirety

City of Paley, Anystate Retirement Plan Status Reconciliation Matrix				
Status	Actives	Terminated with deferred benefit	Retired (in pay status)	Total
Beginning of year	100	25	500	625
New hires	30			30
Terminated with deferred benefit	-20	20		0
Died		-5	-25	-30
Retired	-10	-5	15	0
End of year	100	35	490	625

Trustee Comments

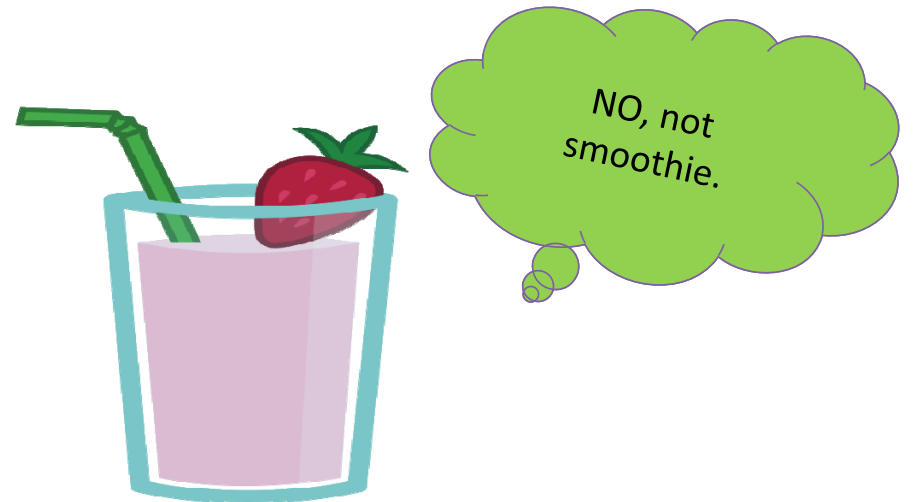
- Did you see anything unusual in the data?
- Were there abnormally large (or small) occurrences of any decrement?
- Does any item of data cause you concern?
- Did you have to make any assumptions about the data?
- Was there much missing data? If so, what assumptions were made about the missing data?
- Is the plan closed to new entrants?
 - If closed, can you see the “end date”?
 - If closed, has the funding and investment policy changed to reflect its closure?



The Actuarially Determined Contribution

Asset Valuation

- Balance sheet
- Income and expense
- And then, smoothing!



The Actuarially Determined Contribution

Asset Valuation and Smoothing Returns

- What is smoothing (of returns)?
- Don't take the full bite of the apple
- Take 20% of the return
- And 20% in each of next four years
- For a “5-year smoothing” period
 - *These are volatile times*



The Actuarially Determined Contribution

Asset Valuation and Smoothing Returns

- Why smooth?
 - Basis of “true trend”
 - Acts like “noise cancelling headphones”
 - Truly done for “smooth” decision making
 - Most used period is a five-year period



Trustee Comments

- What is the difference between the market value and the actuarial value of assets?
- Are there mostly deferred gains or deferred losses coming into the future actuarial assets?
- What is the pressure on the contribution rate due to these asset return deferrals?
- What was the rate of return on an actuarial and a market value basis?
- Do you have any concerns about the way the assets are smoothed?



The Actuarially Determined Contribution

Normal Cost

- Active member only
- Cost of their one-year accrual
- Part of ADC
- Based on benefit and assumptions
 - (has nothing to do with assets)



The Actuarially Determined Contribution

Normal Cost Example

- Assume the plan formula is \$120 per year of service
- The normal cost is the \$120 payable at retirement age, for life
 - (which we estimate is \$1,500)
- But you don't have to contribute \$1,500
 - (*investment earnings pay for some of this*)

The Actuarially Determined Contribution Normal Cost Example

- Assume the discount rate (earnings) is 7%
- If we are 25 years away from that member's retirement, then we only need \$276.37
- The 25 years at 7% will cause the \$276.37 to grow to \$1,500.
- Note: for this accrual, contributions pay for 18% of the benefit and investment earnings pay for 82% of the benefit



- Yeah investment earnings!

The Actuarially Determined Contribution Accrued Liability

- Oft thought of as “the desired amount of assets”
- Unfunded emerge when assets are less than the accrued liability
- A payment on the UAL is the second part of the ADC
 - Many ways to calculate UAL
 - Should align with your policy

The Actuarially Determined Contribution

Unfunded Accrued Liability

- A UAL can arise from a number of sources:
 - Assumptions not met
 - Contributions less than the ADC
 - Retroactive plan amendments

The Actuarially Determined Contribution

Unfunded Accrued Liability-Amortization Payments

- How does one pay off the UAL?
- Factors:
 - Length of time
 - Growth in the amortization payment
 - The ultimate payoff
 - Open (never paid off)
 - Closed (paid off)

The Actuarially Determined Contribution

Unfunded Accrued Liability-There's More

- Watch out for negative amortization
- Manage volatility when possible
- Watch for cliffs in the contribution rate
- Should you have one single UAL or set up a layer for each year
 - (there is always a layer related to assumptions not being exactly met...)
- Have a different policy for surplus



Trustee Comments

- Did the normal cost behave as expected?
- Is the tier structure decreasing the overall normal cost?
- Do employee contributions exceed normal cost?
- Has there been negative amortization?
- What progress have we made in paying off the unfunded accrued liability?

Valuation Results

The Policy Framework

- Valuation results are the expression of the funding policy
- Some of those policies could include:
 - The promised benefits will be here when an employee retires
 - The assumptions are built to last
 - The contribution rate is constructed to be as stable as possible
 - The plan is on a path to full funding (or not)
 - The valuation report creates transparency on the funding strategy for the plan
 - Are there others?



Valuation Results

The Policy Framework

- A healthy plan sponsor supports a healthy plan
- The objectives of the funding policy can support the health of all stakeholders

Trustee Comments

- Why did the contribution rates change?
- What were the biggest factors contributing to the changes in funded position?
- Are all aspects of the valuation in alignment with our funding policy?

Valuation Results

Assumption Performance

- “Loss” - accrued liability is **HIGHER** than expected
 - Expectations are built from assumptions
- “Gain” - accrued liability is LESS than expected
- The interesting part is to look at gains and losses by assumption



Valuation Results

Assumption Performance-By Key Assumption

Annual Change in Accrued Liability due to actual experience differing from assumed

(Gain)-experience was favorable compared to assumptions (lowering the liability)

Salary Increases	\$6.70	<i>A loss here means salary increases were higher than assumed; those higher salaries translate into higher benefits</i>
Retirement	1.5	<i>This may mean more members retired with an early retirement subsidy than assumed; subsidies cost the plan</i>
Mortality	-2.6	<i>Gains on mortality mean more members died than were assumed-more deaths is the same as not living as long as expected</i>
Termination	4	<i>Members were staying in employment and earning more retirement benefits than assumed (not withdrawing)</i>
Disability	-0.6	<i>A few more disability retirements than assumed and disability benefits less valuable than the retirement benefits</i>
New entrants	2.8	<i>This is a usual and customary amount</i>
Other	<u>3.7</u>	<i>This is for all the items that are not in one of the major categories. The important point is to make sure it is NOT the largest item on the list</i>
Total	\$15.40	<i>This says that the accrued liability increased from last year to this year, primarily due to salary increases higher than assumption and withdrawals slower than assumed!</i>



Trustee Comments

- Why did [insert assumption] have a [gain/loss]?
- What are some of the items in the “other” category?
- Does the gain/loss by source show our assumptions are “close” or do they need adjusting?

Looking into the Future

Leading Indicators and Outcomes

Sample Leading Indicator	Sample Outcome
The ADC is always paid	Plan will have assets to cover benefit payments
The balance of the UAL is growing every year	Contributions will need to increase; run projections to see if assets are going to be depleted
The interest rate assumption has not been met over a long period	Assumptions need revising; liabilities and costs shown are not adequate to cover the true costs of the plan; required contributions will increase
The market value of assets is lower than the actuarial value of assets (or vice versa)	Indicates the directional pressure on the contribution rate; deferred asset losses means the rate will increase; deferred asset gains means the rate will decrease

Looking Into The Future

Understanding Where Your Plan Is Headed

- Prudent to look at a 30 year projection of your plan's actuarial metrics

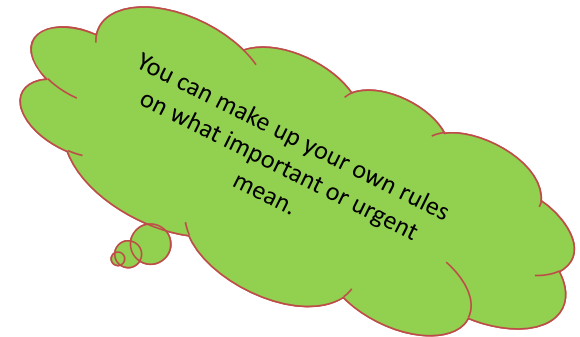
Looking Into The Future

Decision Making

We made up the following decision matrix

Important-Policy infraction

Urgent-Cost (to waiting)



Looking Into The Future

Distinguishing The Important From The Urgent; Actuarial Metrics

A Sample Decision Matrix

You set up your own definition of important and urgent	Not Important (meaning, no policy infraction)	Important (Policy Infraction)	
Urgent (Cost to waiting)	Requires action-not a violation of policy but has a cost (not always monetary) if not handled	Requires Immediate Action	Urgent (Cost to waiting)
Not Urgent	Interesting facts not requiring action	Requires action in the future	Not Urgent
	Not Important (meaning, no policy infraction)	Important (Policy Infraction)	

Looking Into The Future

Distinguishing The Important From The Urgent; Actuarial Metrics

A Sample Decision Matrix

	Not Important (meaning, no Policy Infraction)	Important (Policy Infraction)	
Urgent (Cost to waiting)	Trustees want to get early bird rate on conference	Funded ratio declining; ARC not made for 10 years; plan expected to run out of money in 10 years	Urgent (Cost to waiting)
Not Urgent	A lot of new retirees	Asset returns did not meet the assumed rate this year. Funded ratio dropped below 80%. The principal on the UAL grew.	Not Urgent
	Not Important (meaning, no Policy Infraction)	Important (Policy Infraction)	

Trustee Comments

- What requires immediate action?
- What is the cost of waiting?
- What other risks haven't we talked about?
- Where do the projections show us to be in 30 years?

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NORTHERN TRUST

ASSET MANAGEMENT

NCPERS
TEDS
2019

ASSET ALLOCATION: BUILDING SUCCESSFUL PORTFOLIOS

Bob Parise

Managing Director,

Public Funds & Taft-Hartley

TODAY'S AGENDA

1 Asset allocation: strategic & tactical approaches

2 Risk & return: the efficient frontier

3 Processes & frameworks for successful investing

STRATEGIC ASSET ALLOCATION

Avoiding the “chase”

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	YTD	10 Year Avg. Return
EM Equities 78.0	Cash 20.7	TIPS 13.6	Global RE 23.3	U.S. Equities 52.8	Global RE 14.7	Municipals 5.3	Natural Res. 32.3	EM Fixed 27.8	Global RE 11.2	U.S. Equities 11.8	U.S. Equities 16.6
High Yield 58.8	Global RE 20.0	Municipals 10.7	EM Equities 18.2	Dev. ex U.S. 21.6	U.S. Equities 13.4	U.S. Equities 13.1	High Yield 7.1	Dev. ex U.S. 24.9	EM Equities 17.2	Infrastructure 11.3	Global RE 15.0
Natural Res. 53.6	EM Equities 18.2	Gold 19.2	Dev. ex U.S. 21.6	Infrastructure 12.0	Infrastructure 10.0	Inv. Grade 0.3	Infrastructure 12.0	Natural Res. 22.7	Global RE 11.2	Natural Res. 11.2	High Yield 11.4
Global RE 11.3	Natural Res. 18.6	Inv. Grade 7.8	EM Equities 18.2	60/40 12.7	Municipals 9.1	Cash 0.0	U.S. Equities 12.2	High Yield 7.1	Global RE 11.2	Global RE 10.3	Global RE 11.3
Dev. ex U.S. 34.4	EM Fixed 8.5	Global Fixed 7.6	U.S. Equities 18.2	High Yield 4.1	Inv. Grade 5.1	Global RE 12.2	EM Equities 18.2	Infrastructure 12.0	Global RE 11.2	Dev. ex U.S. 8.1	EM Equities 10.2
U.S. Equities 7.1	U.S. Equities 15.4	High Yield 10.0	60/40 18.1	Global RE 22.2	60/40 5.2	60/40 21.2	EM Equities 18.2	60/40 15.8	U.S. Equities 11.2	EM Equities 9.0	Dev. ex U.S. 10.0
Infrastructure 22.4	High Yield 14.0	U.S. Equities 21.6	Infrastructure 12.0	Cash 0.0	TIPS 3.2	TIPS 1.4	Gold 0.3	EM Fixed 10.2	Global RE 11.2	60/40 7.4	60/40 8.7
Gold 26.3	60/40 11.1	Cash 0.1	60/40 11.9	Natural Res. -0.3	High Yield 2.2	Dev. ex U.S. 2.6	60/40 9.3	Global RE 15.0	U.S. Equities 11.2	High Yield 6.3	Natural Res. 5.5
60/40 23.5	Dev. ex U.S. 8.2	Infrastructure 0.4	Natural Res. 9.0	Inv. Grade 2.0	Global Fixed 0.6	Global Fixed 3.2	TIPS 4.7	Gold 10.7	60/40 8.2	EM Fixed 4.2	EM Fixed 5.1
EM Fixed 21.3	Inv. Grade 6.3	60/40 0.8	TIPS 7.0	EM Equities 12.3	Cash 0.2	High Yield 4.2	Global RE 4.8	High Yield 7.5	Global RE 11.2	Gold 2.7	Municipals 4.6
Municipals 10.3	TIPS 6.3	EM Fixed 1.8	Gold 7.0	Municipals 2.6	Gold 1.3	Gold 10.5	Dev. ex U.S. 3.3	Global Fixed 7.4	Global RE 11.2	TIPS 3.9	TIPS 3.8
TIPS 11.2	Infrastructure 5.3	Global RE -3.1	Municipals 6.8	Global Fixed 2.6	EM Equities 1.8	Infrastructure 11.5	Inv. Grade 2.8	Municipals 3.4	Infrastructure 10.0	Municipals 1.3	Inv. Grade 3.7
Global Fixed 8.8	Global Fixed 5.3	Dev. ex U.S. 11.8	Global Fixed 4.3	TIPS 8.6	Dev. ex U.S. 3.9	EM Equities 14.6	Global Fixed 2.1	Inv. Grade 3.5	Natural Res. -12.6	Inv. Grade 5.0	Gold 3.4
Inv. Grade 6.8	Municipals 2.4	Natural Res. -12.5	Inv. Grade 4.2	EM Fixed 6.0	EM Fixed 5.7	EM Fixed 14.9	Cash 0.3	TIPS 3.0	Dev. ex U.S. 11.2	Global Fixed 0.9	Global Fixed 3.2
Cash 1.1	Cash 0.1	EM Equities 18.2	Cash 6.1	Gold 26.1	Natural Res. -7.2	Natural Res. -24.0	Municipals 0.2	Cash 0.8	U.S. Equities 11.2	Cash 0.4	Cash 0.4

Note: For illustrative purposes only. Source: Northern Trust, Bloomberg. Gross total returns in USD. Year-to-date column through 2/28/19. Indices shown are preferred Investment Policy Committee proxies; 60/40 = 60% MSCI ACWI & 40% Barclays US Agg Bond Index; risk-control assets in shades of green; 10 Year Avg. Return = Compound Annual Growth Rate (trailing 10 years through 2/28/19).

Past performance is no guarantee of future results. Periods greater than one year are annualized except where indicated. Returns reflect the reinvestment of dividends and other earnings and are shown before the deduction of investment management fees, unless indicated otherwise. Returns of the indexes also do not typically reflect the deduction of investment management fees, trading costs or other expenses. It is not possible to invest directly in an index. Indexes are the property of their respective owners, all rights reserved

What is asset allocation?

Factors to consider



Major asset classes

		ASSET CLASS
RISK CONTROL	Bonds	Cash
		Treasury Inflation Protected Securities (TIPS)
		Investment Grade
		High Yield
		Emerging Market Debt
RISK ASSETS	Stocks	U.S. Equities
		Developed Ex-U.S. Equities
		Emerging Market Equities
RISK ASSETS	Real Assets	Infrastructure
		Real Estate
		Natural Resources
RISK ASSETS	Gold	Gold

INVESTMENT RISK

Key investment risk terms



**Standard
deviation**



Correlation

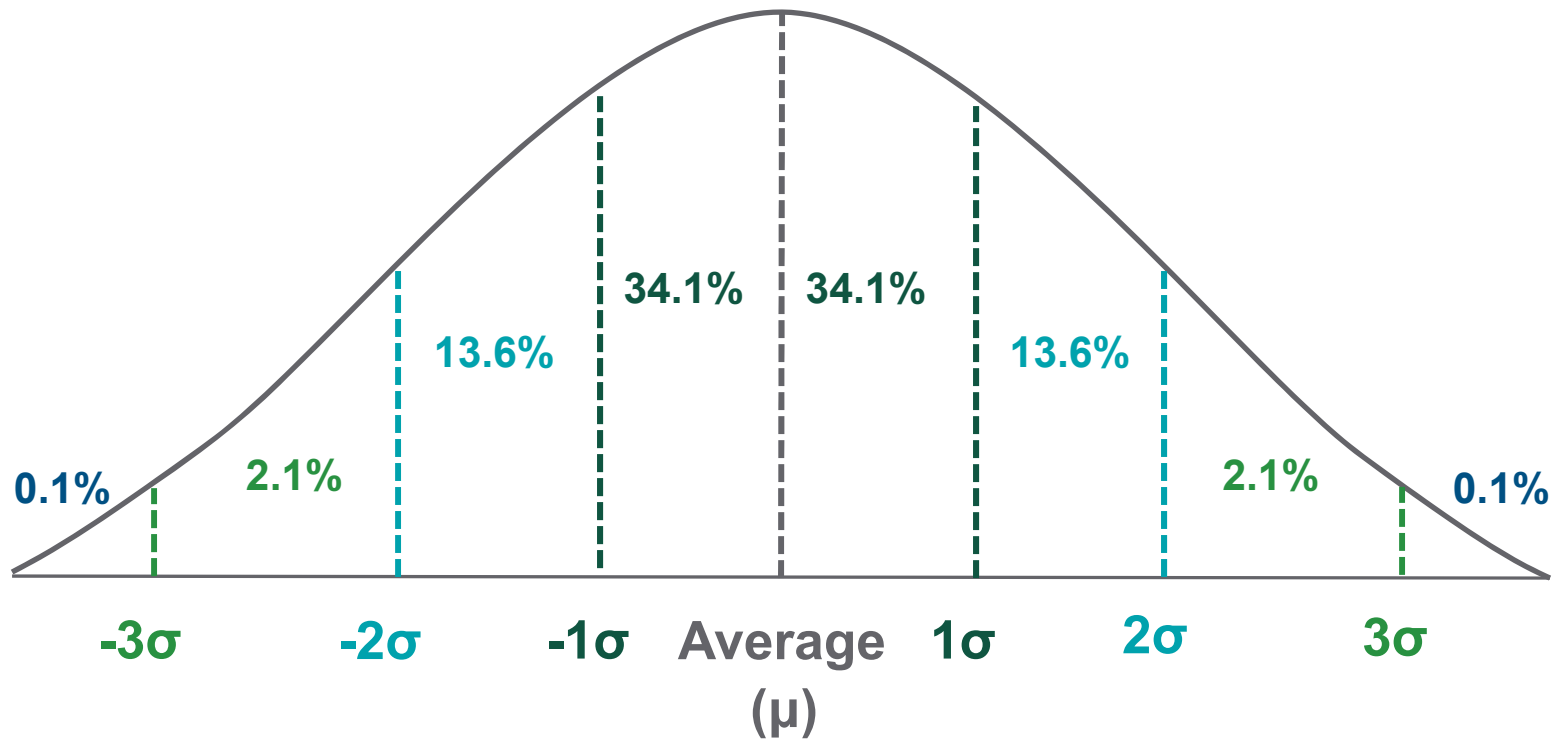


**Sharpe
ratio**

Standard deviation is a statistical measurement. When applied to the annual rate of return of an investment, it sheds light on the historical volatility of that investment. The greater the standard deviation of a security, the greater the variance between each price and the mean, indicating a larger price range.

$$\sigma = \sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$$

Normal distribution graph (bell curve)



Example:

Applied to financial markets, the standard deviation of returns can gauge how large market movements are likely to be, assuming that returns are normally distributed.

However, there are events outside of normal distribution in markets.

The stock market crash of October 1987 was an event around 30 standard deviations away from the average single-day change in the S&P 500.

Correlation is a statistic that measures the degree to which two securities move in relation to each other, used in advanced portfolio management.

$$\rho_{xy} = \frac{Cov(x, y)}{\sigma_x \sigma_y}$$

Correlation example:

SECURITY	HISTORIC RETURN	STANDARD DEVIATION	COVARIANCE (X,Y)
Company X Common Stock	1.0%	0.456%	0.1925
Company Y Common Stock	3.0%	0.522%	0.1925

$$\rho_{xy} = \frac{0.1925}{(0.456)(0.522)} = .809$$

Correlation matrices

Ticker	S&P 500	C. Disc.	C. Stap	Energy	Finan.	H Care	Indust.	Mater.	Tech	Telcom	Utilit.	Oil	Gold	Dollar	L Bnd
S&P 500	1.00	0.93	0.83	0.89	0.88	0.78	0.95	0.90	0.92	0.74	0.77	0.52	0.14	-0.41	-0.38
Cons. Disc.	0.93	1.00	0.75	0.78	0.78	0.68	0.92	0.83	0.89	0.68	0.68	0.45	0.08	-0.34	-0.37
Cons. Stap.	0.83	0.75	1.00	0.72	0.62	0.78	0.76	0.70	0.72	0.69	0.73	0.39	0.11	-0.33	-0.35
Energy	0.89	0.78	0.72	1.00	0.71	0.66	0.84	0.85	0.78	0.63	0.74	0.64	0.24	-0.47	-0.37
Financials	0.88	0.78	0.62	0.71	1.00	0.58	0.80	0.75	0.73	0.62	0.57	0.41	0.05	-0.32	-0.28
H Care	0.78	0.68	0.78	0.66	0.58	1.00	0.69	0.63	0.67	0.59	0.67	0.34	0.09	-0.28	-0.29
Industrials	0.95	0.92	0.76	0.84	0.80	0.69	1.00	0.87	0.88	0.69	0.72	0.51	0.12	-0.38	-0.38
Materials	0.90	0.83	0.70	0.85	0.75	0.63	0.87	1.00	0.82	0.64	0.68	0.53	0.28	-0.47	-0.32
Technology	0.92	0.89	0.72	0.78	0.73	0.67	0.88	0.82	1.00	0.69	0.68	0.44	0.12	-0.36	-0.37
Telecom	0.74	0.68	0.69	0.63	0.62	0.59	0.69	0.64	0.69	1.00	0.64	0.34	0.04	-0.30	-0.24
Utilities	0.77	0.68	0.73	0.74	0.57	0.67	0.72	0.68	0.68	0.64	1.00	0.42	0.17	-0.34	-0.30
Oil	0.52	0.45	0.39	0.64	0.41	0.34	0.51	0.53	0.44	0.34	0.42	1.00	0.35	-0.42	-0.28
Gold	0.14	0.08	0.11	0.24	0.05	0.09	0.12	0.28	0.12	0.04	0.17	0.35	1.00	-0.34	0.00
Dollar	-0.41	-0.34	-0.33	-0.47	-0.32	-0.28	-0.38	-0.47	-0.36	-0.30	-0.34	-0.42	-0.34	1.00	0.01
Long Bond	-0.38	-0.37	-0.35	-0.37	-0.28	-0.29	-0.38	-0.32	-0.37	-0.24	-0.30	-0.28	0.00	0.01	1.00

For illustrative purposes only.

Sharpe ratio is the average return earned in excess of the risk-free rate per unit of volatility or total risk. In subtracting the risk-free rate from the mean return, the performance associated with risk-taking activities can be isolated. Generally, the greater the value of the Sharpe ratio, the more attractive the risk-adjusted return.

$$S = \left(\frac{R_p - R_f}{\sigma_p} \right)$$

Sharpe ratio example:

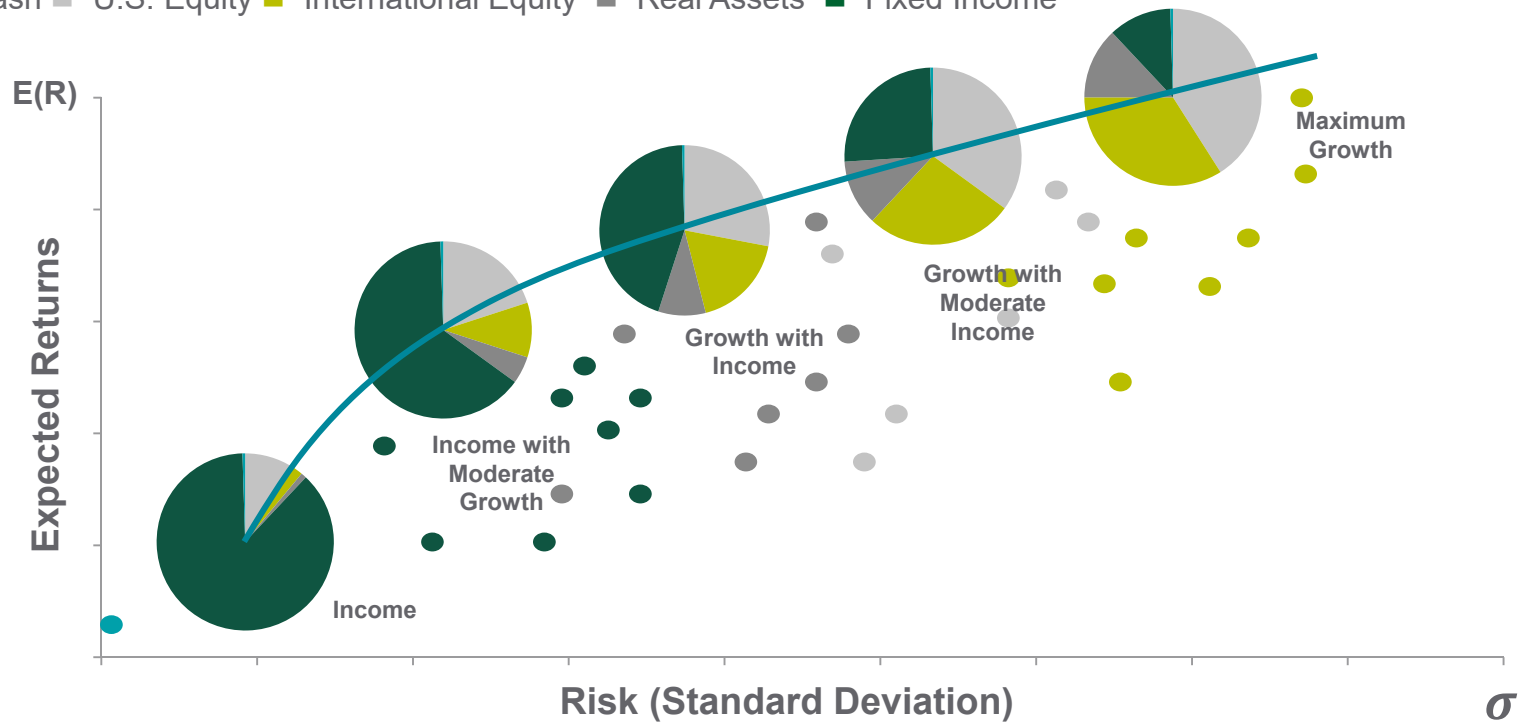
MANAGER	AVERAGE (MEAN) RETURN	RISK FREE RATE	STANDARD DEVIATION (RISK)
Manager ABC	12.0%	2.4%	10.0%

$$S = \left(\frac{12.0\% - 2.4\%}{10.0\%} \right) = 0.96$$

What is the efficient frontier?

The efficient frontier

■ Cash
 ■ U.S. Equity
 ■ International Equity
 ■ Real Assets
 ■ Fixed Income



For illustrative purposes only.

TACTICAL ASSET ALLOCATION

Tactical asset allocation is used to develop short-term strategies to exploit changes in market conditions and is often viewed as a contrarian strategy.

Practical issues include more frequent rebalancing and constraints on a “swing component”.

The asset allocation process



KEY TAKEAWAYS

1

Get paid for the risk you take

2

Stay focused and make informed decisions

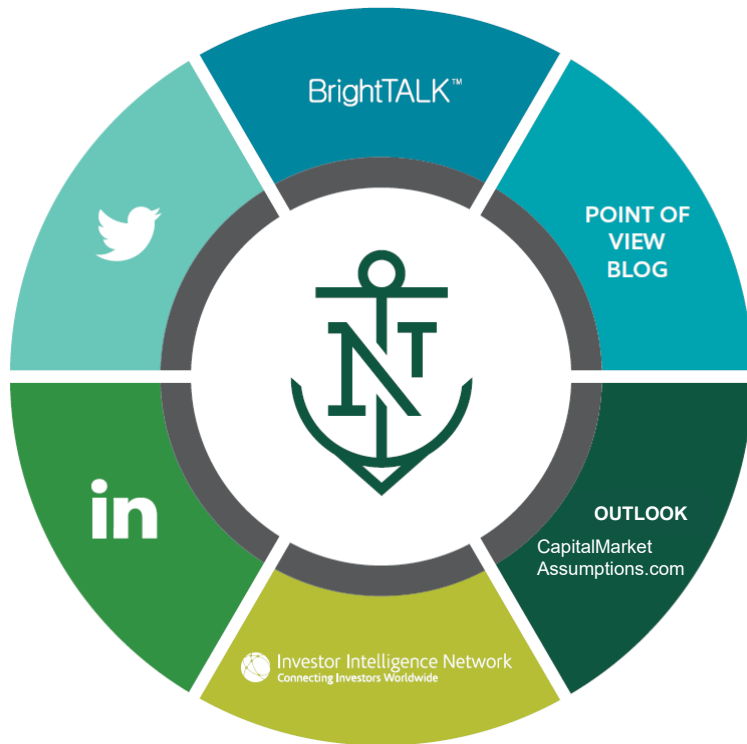
3

Establish frameworks and policies for successful investing

QUESTIONS

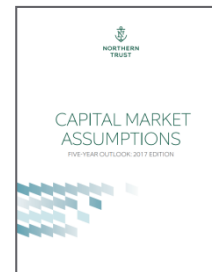


Accessing our Global Insights



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FIVE-YEAR OUTLOOK



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Articles, Webinars, Videos



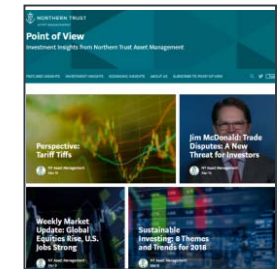
MARKETSCOPE

Meaningful Insights in Less Than 3 minutes



BLOG

Timely market perspectives





NORTHERN TRUST

ASSET MANAGEMENT

ASSET
ALLOCATION
GAME

THE RISK IS RIGHT

With your host... *Cowboy Bob*

Housekeeping items

- You will work as a team with your fellow Trustees
- Each team will use an iPad
- Choose a Team Name
 - 10 character limit
 - No special characters

***You have three minutes to come up with a team name,
have fun and be creative!***

How the game will work

- **There are three rounds and prizes for each team who is closest to the objectives**
- **The objective is to build a portfolio that meets a return and risk target**
- **There are eight investments to choose from and slide the bar up and down to choose an allocation**
- **Max of 30% per asset class/investment**
- **5% cash allocation**



NORTHERN TRUST

ASSET MANAGEMENT

THE RISK IS RIGHT

Round 1

Round 1

Scenario: Shelbyville PERS sponsors an open, 80% funded DB plan with \$250M in assets. The plan has a return and risk target of **7.5%** and **4.5%**, respectively.

Objective: Using the “asset classes” below, determine the optimal asset allocation.

ASSET CLASS	10-YEAR RETURN	10-YEAR STANDARD DEVIATION
Cash	0.4%	0.2%
Investment 1	3.5%	2.8%
Investment 2	11.4%	7.7%
Investment 3	4.2%	12.1%
Investment 4	14.3%	14.0%
Investment 5	8.5%	16.1%
Investment 6	10.5%	19.3%
Investment 7	5.1%	5.1%
Investment 8	11.3%	9.4%

Note: For illustrative purposes only. Please see important information on Hypothetical Returns at the end of this presentation.



NORTHERN TRUST

ASSET MANAGEMENT

THE RISK IS RIGHT

Round 2

Round 2

Scenario: Shelbyville PERS sponsors an open, 80% funded DB plan with \$250M in assets. The plan has a return and risk target of **7.5%** and **12.0%**, respectively.

Objective: Using the “asset classes” below, determine the optimal **5-year** asset allocation.

ASSET CLASS	PROJECTED 5-YEAR RETURN	PROJECTED 5-YEAR STANDARD DEVIATION
Cash	2.2%	0.5%
Investment 1	3.7%	3.4%
Investment 2	5.3%	9.1%
Investment 3	6.5%	11.7%
Investment 4	6.8%	13.8%
Investment 5	7.5%	16.4%
Investment 6	10.6%	21.3%
Investment 7	4.5%	5.7%
Investment 8	9.6%	17.9%

Note: For illustrative purposes only. Please see important information on Hypothetical Returns at the end of this presentation.



NORTHERN TRUST

ASSET MANAGEMENT

THE RISK IS RIGHT

Round 3

Round 3

Scenario: Shelbyville PERS sponsors an open, 80% funded DB plan with \$250M in assets. The plan has a return and risk target of **7.5%** and **12.0%**, respectively.

Objective: Using the **traditional** asset classes below, determine the optimal 5-year asset allocation.

ASSET CLASS	PROJECTED 5-YEAR RETURN	PROJECTED 5-YEAR STANDARD DEVIATION
Cash	2.2%	0.5%
U.S. Inv. Gr. Bonds	3.7%	3.4%
U.S. High Yield Bonds	5.3%	9.1%
Emerging Markets Debt	6.5%	11.7%
U.S. Equity	6.8%	13.8%
Developed ex-U.S. Equity	7.5%	16.4%
Emerging Market Equity	10.6%	21.3%
Hedge Funds	4.5%	5.7%
Private Equity	9.6%	17.9%

Note: For illustrative purposes only. Please see important information on Hypothetical Returns at the end of this presentation.



NORTHERN TRUST

ASSET MANAGEMENT

THANK YOU



ASSET
ALLOCATION
GAME

Intra-round winners



Grand prize winners



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**NORTHERN
TRUST**

Legal Implications and Ethics of Trustee Communications – When Talk is NOT Cheap

NCPERS UNIVERSITY
Trustee Educational Seminar
May 18 - 19
Austin, TX



Trustee Communications

- Overview
- Communication at a Board Meeting
- Communication outside of a Board meeting
 - Members & Retirees
 - Vendors and Consultants
 - Staff
 - The Press and Media
- Communication with Legal Counsel



Nature of Public Retirement System Trustees

You are volunteers and may not have experience with various aspects of serving as public pension trustees:

- Member of a Board of Trustees
- Public official of governmental body
- Public meetings and open government
- Interactions with legal counsel
- Interactions with the media
- Appointed or elected official who is a fiduciary



When Talk is Not Cheap

Trustee communications in certain circumstances can give rise to legal, fiduciary, and governance issues. Examples:

- Disclosure of confidential information
- Ethics violations
- Open government implications
- Miscommunication to members and retirees
- Undue influence over staff

Good Advice?



Importance of Communication

- Your voice is important and participation on your Board is essential to satisfy your fiduciary duties.
- Don't stop communicating...just be aware of when and how your communication might have other implications.



Communication at a Board Meeting

- Procedural Aspects
- Confidential and Sensitive Information
- Advice from Legal Counsel
- Fiduciary Concerns

Trustee Communication at a Board Meeting— Procedural Aspects

Parliamentary Procedures and Communication

- Procedures are often different for every Board.
- May have legal parameters or requirements.
- Chair or presiding officer typically governs the meeting and recognizes trustees to speak.
- Communication is typically limited to agenda topics.

Trustee Communication at a Board Meeting— Procedural Aspects

Communication and Agendas

- Open meetings laws may require posting of agenda.
- Speaking “off topic” may be legally impermissible.
- Chair or presiding officer often announces agenda item for presentation and discussion.
 - Speaking on agenda item when not presented on the floor is discouraged.
 - Items can usually be discussed out of order at discretion of Chair or presiding officer.



Trustee Communication at a Board Meeting— Procedural Aspects

Open Meeting vs. Closed Sessions

- Generally, all discussions of a public body must be held in an open meeting.
 - Requirements governed by State law
- Some States allow confidential discussions to be held in closed session for confidential communications.
- Procedural requirements often apply with closed sessions.



Trustee Communication at a Board Meeting— Confidential Information

- Inherent conflict between requirements for open government and public discussion and topics involving confidential information.
- *Confidential information* is information that cannot be publically disclosed under law or contract. Examples:
 - Privacy laws relating to financial information
 - HIPAA and privacy laws relating to health information
 - Information confidential under state laws
 - Information confidential under contractual obligations



Trustee Communication at a Board Meeting— Sensitive Information

- *Sensitive information* is information for which disclosure is not legally impermissible, but might be detrimental to the interests of the retirement system.
- No strict legal requirement to keep sensitive information confidential, but information may be excepted from public disclosure.
- Examples:
 - Attorney-client communications
 - Information regarding negotiations (pricing and terms of property sales, vendor contracts, etc.)



Trustee Communication at a Board Meeting— Confidential vs. Sensitive Information

- Confidential information: Do not disclose or discuss in open meeting!!
- Sensitive information: Think carefully before you discuss in public and seek advice of staff or counsel.
- Public discussion of sensitive information might be unavoidable to fulfill fiduciary duties or to comply with open government requirements.



Trustee Communication at a Board Meeting— Advice from Legal Counsel

- Trustee requests for legal advice may occur during a public meeting, and maintaining attorney-client privilege becomes a concern.
- Public discussion of item will prevent assertion of attorney-client privilege.
- If the nature of the request involves discussions where confidential communication is involved, closed or executive session may be available, depending on State laws.



Trustee Communication at a Board Meeting— Advice from Legal Counsel

Thoughts on Attorney-Client Communication in Open Session

- General statements of the law and what it requires are ok.
- Comments like “Do you have thoughts on this?” or “What are our options?” may give rise to requests for legal advice.
- Try to prepare in advance and avoid situations for spontaneous attorney-client confidential communication.



Trustee Communication at a Board Meeting— Advice from Legal Counsel

Closed or Executive Session

- Some States allow for attorney-client communication to held in closed or executive session.
- Communication usually limited to attorney-client communications with attorney present at the session.
- Watch for discussions “swerving” into realm that does not involve legal advice or legal implications.



Trustee Communication at a Board Meeting— Fiduciary Concerns

- Communications during a Board meeting may create fiduciary concerns:
 - “We don’t have enough information to make this decision.”
 - “I was elected by the members of the System, and I’m going to do what is best for them.”
 - “This topic was presented to us at the last minute, and I’m not prepared to vote on this.”



Trustee Communication at a Board Meeting— Fiduciary Concerns

- Expressing your concerns regarding a Board action is of course critical to your fiduciary duties.
- Recognize that public expression of your concerns may have fiduciary implications.
- How to prevent these communications?
 - Be prepared for meetings.
 - Address concerns with staff or Board chair before a public meeting.



Don't let this be your daughter!



Trustee Communication Outside of a Meeting

- Members & Retirees
- Vendors and Consultants
- Staff
- The Press and Media
- Legal Counsel



Trustee Communication Outside of a Meeting— Members and Retirees

- Requests by members and retirees for information from trustees is not uncommon.
- Important concerns and considerations exist in communicating with members and retirees:
 - Miscommunications and reasonable reliance
 - Disclosure and receipt of confidential information
 - Governance and speaking with “one voice” as a Board



Trustee Communication Outside of a Meeting— Members and Retirees

Miscommunications and reasonable reliance

- Members and retirees may request general or personal benefit information or assistance with a particular outcome.
- If you provide such information or promise an outcome, and the member or retiree reasonably relies upon such communication, a member or retiree might have a claim against the fund.
- Best practice is to refer such requests for information or assistance to staff.



Trustee Communication Outside of a Meeting— Vendors and Consultants

- Communication with vendors and consultants may occur at conferences or other social gatherings.
- Procurement laws and procedures or ethics policies may have specific prohibitions relating to these communications in connection with a search process (aka “black-out period”).
- Addressing consultant or vendor requests by individual trustees may give rise to misrepresentations or create governance issues.



Trustee Communication Outside of a Meeting— Communications with Staff

- Trustees should and are encouraged to reach out to staff for information needed to satisfy fiduciary duties.
- However, trustees must keep in mind that they hold a position that gives rise to potential “undue influence” with respect to staff.
- Undue Influence—your position of authority makes a staff member do something that he or she would not normally do.

Trustee Communication Outside of a Meeting— Communications with Staff

Limiting Potential Undue Influence

- Be mindful of Board governance and any relevant policies.
- Communicate with Executive Director first to be referred to appropriate staff member.
- Consider whether requests for information are necessary and appropriate in connection with your duties.
- Pass along requests from members, retirees and vendors, but do not advocate or encourage a particular result.



Trustee Communication Outside of a Meeting— The Press and Media

- The most critical issue with the press and media often revolves around fiduciary and governance concerns when asked for personal views on an issue facing the Board.
- Fiduciary duties demand that you act in the best interest of the retirement system or fund, and working against Board action or initiatives through the press is counter to such duties.
- Speaking with “one voice” through a designated representative of the Board avoids these issues.
- If personal views are expressed, they should be clearly identified as personal views and not presented in a manner that works against the Board’s actions.



Trustee Communication Outside of a Meeting— with Legal Counsel

- When a trustee communicates directly with legal counsel regarding a legal issue, both trustee and legal counsel must be aware that legal counsel represents the System and not the individual trustee.
- Advice to an individual trustee on general legal issues facing the System may be consistent with representation of System as a whole.
- That said, governance issues should be considered if you are directly communicating with legal counsel, especially if your request involves significant System resources.



Trustee Communication Outside of a Meeting— with Legal Counsel

However, if you are communicating with legal counsel regarding a personal interest potentially adverse to interests of the System:

- Such communication is not privileged.
- Legal counsel may have an obligation to disclose the matter to the appropriate party (Board Chair, Executive Director, etc.).

Trustee Communication Outside of a Meeting— with Legal Counsel

Thoughts on individual communications between trustees and legal counsels

- Despite potential pitfalls, trustees are not discouraged from seeking counsel.
- In many instances, issues facing an individual trustee are consistent with representation of the System, but if any question, be sure and clarify.
- Have a policy in place, even if informal, on who can initiate a project with legal counsel.





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