Callan

MENDOCINO COUNTY EMPLOYEES
RETIREMENT ASSOCIATION

Mendocino County Employees Retirement Association:
Asset Liability Study Discussions Continued

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Agenda

Background

- At the August meeting, the Board reviewed an Asset Liability Study where we analyzed 1) the level of risk and return and 2) whether new asset classes (Private Equity and Infrastructure) should be introduced to the Plan
- The Board agreed that a change in the overall return and risk profile is not warranted
- However, a decision was made to continue to explore the potential benefits to the total portfolio of adding private infrastructure and/or private equity
- Private infrastructure could improve the Investment Program by increasing exposure to Real Assets
  - Impact on return and risk is minor in normal environments
  - In practice private infrastructure should add a diversified source of returns with the potential for improved performance in inflationary environments
- Private equity in the Investment Program offers the opportunity for improved performance or reduced volatility
  - Private equity is expected to increase the projected return at a given volatility level or reduce volatility for a given return target
  - Private equity costs are high and decisions to invest are long-term

Private Equity & Infrastructure:
Benefits and Considerations

Private Equity

Benefits and Considerations

Benefits

- Should provide a return in excess of public equity over the long term
- Provides a differentiated return stream and diversification
- Addresses a different opportunity set – private companies
- Private equity market is fragmented (no central marketplace) and partially regulated
  - Creates opportunities for GPs with skill to add value

Use by other Public Plan peers?

- Percent of Public Pension Plans Invested: **30%**
- Median % of Portfolio Invested (when used): **6%**

Considerations

- Private equity is illiquid
- Implementation is a primary risk and critical to success
  - Decisions made today last 10 to 15 years
- Program complexity
  - Takes five or more years to become fully funded
  - Ongoing implementation – periodic reinvestments
- Return calculation and benchmarking methodology differ from public equity, and performance data is not publicly available
- The J-curve effect can potentially detract from short-term performance
  - Returns and asset values take time to develop (negative early returns)
- Fees are high compared to public market equity
  - Management fees including fund-of-funds fees
  - Administrative costs including Board and staff initiation, maintenance and monitoring time

Real Assets

Potential Benefits

Portfolio diversification	Real assets tend to have complementary return profiles relative to stocks and bonds.
Predictable and steady streams of income	Real assets tend to have predictable and steady cash-flow streams supported by regulated or contractual revenues and attractive operating margins.
Capital appreciation potential	As the backbone of the global economy, real estate, infrastructure and sustainable resources are all subject to long-cycle fundamental drivers. Examples include population growth, urbanization trends and periodic supply constraints that can lead to capital appreciation.
Potentially higher risk-adjusted returns	Historically, the volatility of many real asset classes has been lower than that of equities, leading to higher risk-adjusted returns.
Inflation protection	History shows that real assets have outperformed stocks and bonds in periods of unexpected inflation, based on total return. One reason is that the cash flows of the underlying assets tend to rise with inflation.

Use by other Public Plan peers?

- Percent of Public Pension Plans Invested in Real Assets (excluding real estate): **25%**
- Median % of Portfolio Invested (when used): **5%**

Infrastructure

Unlisted Infrastructure Investments

Benefits

- Cash flows may be durable with a measure of inflation linkage
- Access to long-lived assets which are hard to replicate and offer a range of defensive income streams, monopoly market positions with high barrier to entry or regulated markets
- Appraisal-based valuations thus reduced price volatility
- Global or non-U.S. funds provide exposure to non-dollar currencies and can serve as a further hedge against inflation as well as declines in the U.S. dollar

Considerations

- Diversification may be challenging due to large asset sizes
- Long hold periods, exit strategy may be unclear
- Appropriate benchmark undefined
- Some assets may become less-defensive as consumer demand, regulation or the competitive landscape changes
- Interest-rate movements could have significant impact on the value of assets, depending on the level of leverage

The flexibility to invest in infrastructure could offer further diversification, enhanced return opportunities, or both

Asset Liability Study:
Selected Alternative Mixes Revisited

Asset Mix Alternatives

Asset Classes	Current Target	Mix 4: + Infrastructure	Mix 4P: +Infrastructure & Private Equity	Mix 4LP: (Low Disruption) +Infrastructure & Private Equity
Broad US Equity	38	37	28	31
Global ex US Equity	29	25	19	21
Domestic Fixed	22	21	33	25
Real Estate	11	11	6	11
Private Infrastructure	0	6	3	4
Private Equity	0	0	11	8
Totals	100	100	100	100
1-Year Return	7.53	7.55	7.43	7.63
10-Year Compound Return	6.79	6.80	6.80	6.89
Risk (Standard Deviation)	13.73	13.79	12.86	13.72

Public Equity	67	**62**	**47**	**52**
Total Equity	67	**62**	**58**	**60**
Bonds	22	21	**33**	**25**
Illiquid	11	**17**	**20**	**23**
Real Assets	11	**17**	**9**	**15**

Orange: Higher allocation than current target

Blue: Lower allocation from current target

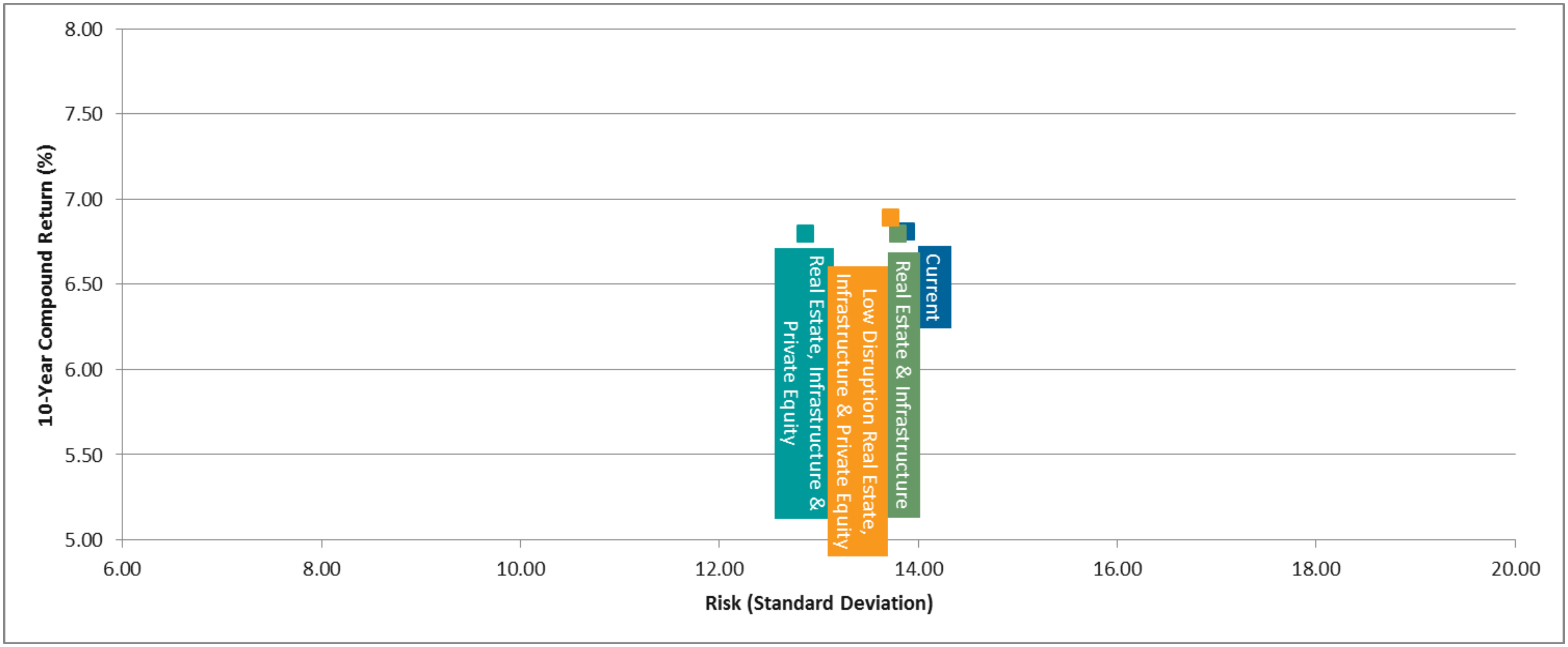
- Targeted returns are similar across all mixes, with and without private equity
- Mix 4 includes infrastructure, but not private equity
- Mix 4P is constructed with private equity at 25% of total public equity
- Low Disruption Mix 4LP is constructed with private equity implemented with 15% of total public equity

Benefits and Considerations of Alternative Asset Mixes

	Change	Benefits	Considerations
Current Target:		• Meets desired expected return • High liquidity	• High public equity beta • Volatile peer group comparison
MIX 4: **Real Estate & Infrastructure**	Equity: -1% Int'l Equity: -4% Fixed Income: -1% Infrastructure: +6%	• Meets desired expected return • Improves diversification • Infrastructure provides differentiated return stream • Increases real assets	• Increases illiquid portion of portfolio • Increases complexity
MIX 4P: **Real Estate, Infrastructure & Private Equity**	Equity: -10% Int'l Equity: -10% Fixed Income: +11% Real Estate: -5% Infrastructure: +3% Private Equity: +11%	• Meets desired expected return • Reduces expected volatility • Improves diversification • Infrastructure & private equity provide differentiated return stream • Potential illiquidity premium • Higher fixed income allocation/less reliance on public equity	• Increases illiquid portion of portfolio • Higher investment management costs • Increases complexity • Disruptive
MIX 4LP: **Low Disruption Real Estate, Infrastructure & Private Equity**	Equity: -7% Int'l Equity: -8% Fixed Income: +3% Infrastructure: +4% Private Equity: +8%	• Meets desired expected return • Improves diversification • Infrastructure & private equity provide differentiated return stream • Potential illiquidity premium • Less disruptive to implement than Mix 4P • Higher fixed income allocation/less reliance on public equity • Increases real assets allocation	• Increases illiquid portion of portfolio • Higher investment management costs due to private equity and infrastructure • Increases complexity

Asset Mix Alternatives

Efficient Frontier



- Projected risk (standard deviation) versus projected return for each of the four mixes under consideration is plotted on the chart above
- The risk/return profiles of the mixes are more similar than they are different

Appendix

Private Equity

Definition

Private equity: Private unlisted investments in operating companies, typically accessed through limited partnerships (not listed on a public exchange)

- Investors must be accredited to participate
- While commonly viewed as a separate asset class, it is an extension of equity
- Fewer regulatory disclosure requirements, longer investment horizon, and higher fees than publicly traded equities
- Investment is achieved through partnership structures that are less liquid than public equity

Role: capital growth

- The key goal is to achieve returns in excess of public equity
- Managed for long-term gain, not quarterly earnings

2019 Callan Capital Market Projections: Risk and Return – 2019-2028

		PROJECTED RETURN			PROJECTED RISK		2018 - 2027	
Asset Class	Index	1-Year Arithmetic	10-Year Geometric*	Real	Standard Deviation	Projected Yield	10-Year Geometric*	Standard Deviation
Equities								
Broad U.S. Equity	Russell 3000	8.50%	7.15%	4.90%	17.95%	2.00%	6.85%	18.25%
Global ex-U.S. Equity	MSCI ACWI ex USA	9.20%	7.25%	5.00%	21.10%	3.10%	7.00%	21.00%
U.S. Fixed	Bloomberg Barclays Aggregate	3.75%	3.75%	1.50%	3.75%	3.85%	3.00%	3.75%
Real Estate	NFI-ODCE	7.30%	6.25%	4.00%	15.70%	4.75%	5.75%	16.35%
Private Equity	Cambridge Private Equity	12.40%	8.50%	6.25%	29.30%	0.00%	7.35%	32.90%
Inflation	CPI-U		2.25%		1.50%		2.25%	1.50%

Real Assets

Overview

Real assets: physical assets that have value due to their substance and properties.

Investments in the “real” economy (e.g. Real estate, Infrastructure, Commodities, etc.)

Role: to generate competitive returns with low correlations to equities and fixed income

- Real estate represents the largest allocation in the real assets allocation institutional portfolios
- Inflation protection characteristics

Primary determinants of performance

- Strategy type and the stage in the economic cycle
- Degree of leverage
- Location/sector

Use by other Public Plan peers?

- Percent of Public Pension Plans Invested in Real Assets (excluding real estate): **20%**
- Median % of Portfolio Invested (when used): **6%**

Alternative Real Assets to Complement Real Estate

August 2018 MCERA Discussions

In August of last year, Mendocino discussed expanding real asset exposure to provide a more diversified inflation hedge.

Currently, real estate is the sole “real asset” in the Mendocino investment portfolio. Mendocino has exposure to 2 core open-ended funds, plus the MCERA building in Ukiah (valued at $1,150,000), targeting 11% of the total fund.

Callan believes private real estate should continue to comprise the core of a real asset exposure:

- Provides a solid long-term hedge with a reasonably high level of short-term correlation to inflation
- During normal markets real estate provides a high level of current income, a relatively high rate of return, low observed volatility, and is a good diversifier to a stock and bond portfolio

At the August 2018 meeting, the following additional private real assets were considered as complements to real estate:

- Infrastructure
- Timber
- Agriculture
- Public Real Assets

Unlisted open-end infrastructure appears to offer the best fit to the MCERA portfolio

Private Equity Returns: Why Bother?

Private Equity Performance Database – Pooled Horizon IRRs Through December 31, 2018 – Returns are net of fees

Strategy	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
All Venture	18.7%	10.6%	14.3%	13.5%	11.1%	17.3%
All Buyouts	8.4%	14.6%	12.1%	14.3%	13.7%	12.2%
Mezzanine	9.7%	11.7%	10.5%	10.8%	10.0%	8.9%
All Private Equity	**10.7**%	**13.1**%	**11.9**%	**14.0**%	**12.7**%	**12.7**%
S&P 500	-4.4%	9.3%	8.5%	13.1%	7.8%	5.6%

Source: Refinitiv/Cambridge and Callan

There can be large return differences between strategy types over time

- Each strategy has contributed to success at various times
- MCERA would invest in a diversified fund-of-funds with exposure to the various different strategy types

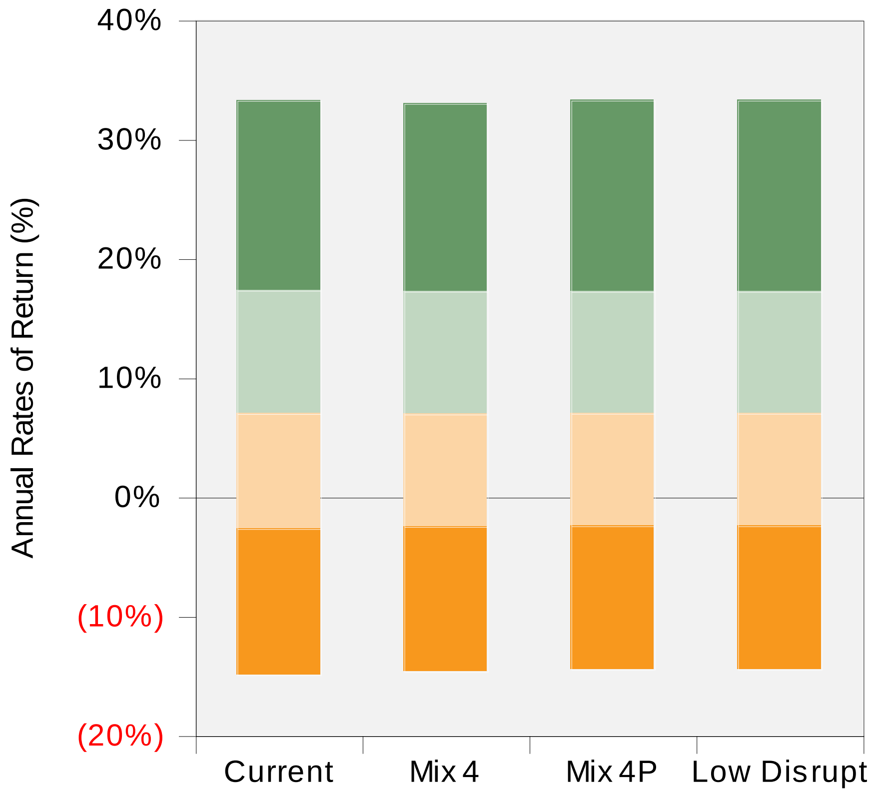
"All Private Equity" outperforms public stocks in the longer horizons

- Approximately 3% or more depending on the period

Asset Mix Alternatives

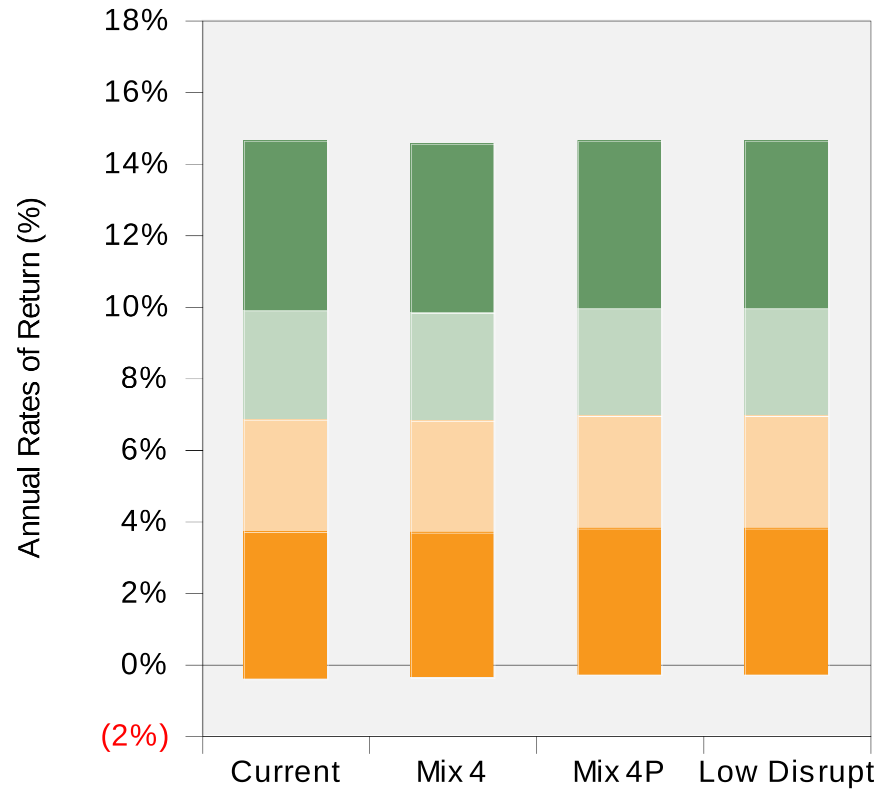
Range of Returns

1 Year



	Current	Mix 4	Mix 4P	Low Disrupt
5th Percentile	33.3%	33.0%	33.3%	33.3%
25th Percentile	17.4%	17.3%	17.3%	17.3%
Median	7.0%	7.0%	7.0%	7.0%
75th Percentile	(2.6%)	(2.5%)	(2.4%)	(2.4%)
95th Percentile	(14.9%)	(14.6%)	(14.4%)	(14.4%)

10 Years



	Current	Mix 4	Mix 4P	Low Disrupt
5th Percentile	14.6%	14.6%	14.6%	14.6%
25th Percentile	9.9%	9.8%	10.0%	10.0%
Median	6.8%	6.8%	6.9%	6.9%
75th Percentile	3.7%	3.7%	3.8%	3.8%
95th Percentile	(0.4%)	(0.4%)	(0.3%)	(0.3%)

Appendix: June 2019 Meeting Discussion

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June 2019

Mendocino County Employees' Retirement Association

Private Infrastructure

Private Real Estate Debt

Private Equity

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Agenda

Infrastructure Definition and Market Observations

Infrastructure as an Investment

Real Estate Debt

Appendix

Infrastructure Definition and Market Observations

What is Infrastructure

Characteristics

- Facilitates movement of people, goods, and ideas
- Essential for the economic productivity of a society

Economic Infrastructure			Social Infrastructure
Transportation – Bridges – Toll Roads – Tunnels – Airports – Seaports – Rail	**Utilities** – Gas – Electric – Water	**Communications** – Cable systems – Wireless towers – Broadcast towers – Satellites	– Educational facilities – Medical facilities – Correctional facilities – Public transportation – Judicial facilities – Public Private Partnerships (“PPP” or “P3”)
Renewable Energy – Solar – Wind – Bio-Mass – Hydro	**Water / Waste** – Water treatment – Water desalination – Waste management	**Energy** – Energy transmission – Energy storage	

What is the Driver for Global Infrastructure Investment Today?

Aging Infrastructure, Renewable Energy Targets and U.S. Energy Discoveries

Sector	Demand driver	Infrastructure Type
Energy	Development of oil and shale resources in the US	Mid-stream energy related transmission and storage
Power	Trend for reduced carbon emissions and non-nuclear power	Wind, solar, hydro, geothermal power, new transmission technology
Transport	Increased demand, historic under-investment and aging infrastructure	Airports, roads, ports, parking structures
Communications	Increased demand with new technology	Telecom, fiber optic, cellphone towers
Water	Increased demand, historic under-investment and aging infrastructure	Water utilities, wastewater systems
Social	Insufficient municipal budgets	Healthcare, judicial, education facilities, Public Private Partnerships

Infrastructure

Listed vs Unlisted Investments

Listed Infrastructure Investments

- Consists of publicly traded stocks of companies engaged in infrastructure-related activities
- Economic infrastructure rather than social infrastructure
- Emphasis on appreciation

Strengths

- Quickly and easily assembled
- Liquidity
- Flexibility

Weaknesses

- Shares volatility of equity markets
- Higher emphasis on capital gains rather than income
- Appropriate benchmark undefined

Unlisted Infrastructure Investments

- Asset level investments
- Leverage can range from 20-75%+ on an asset level, generally less than 60% on an overall portfolio level
- Emphasis on income or appreciation depending on strategy

Strengths

- Cash flows may be very durable and backed by stable offtake contracts, with a measure of inflation linkage
- Assets may be highly monopolistic
- Appraisal-based valuations thus reduced price volatility

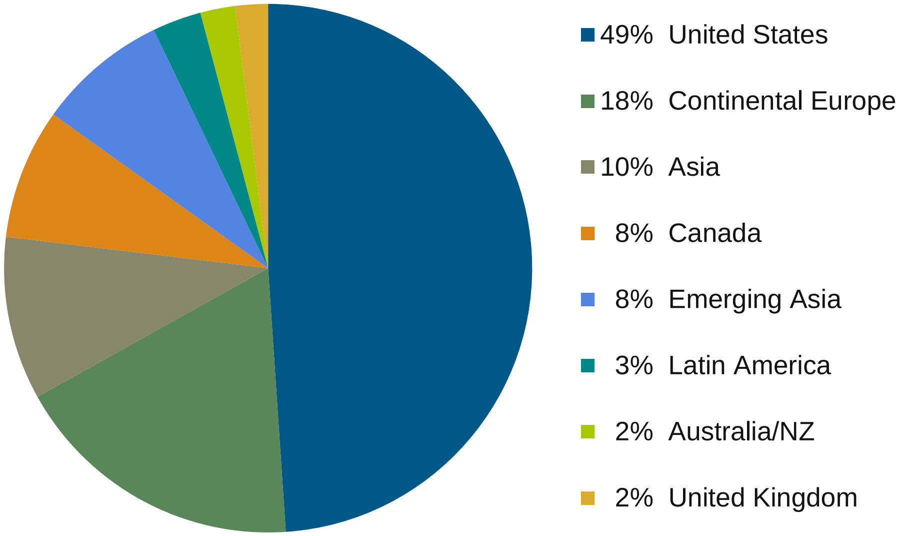
Weaknesses

- Diversification may be challenging due to large asset sizes
- Long hold periods, exit strategy may be unclear
- Appropriate benchmark undefined

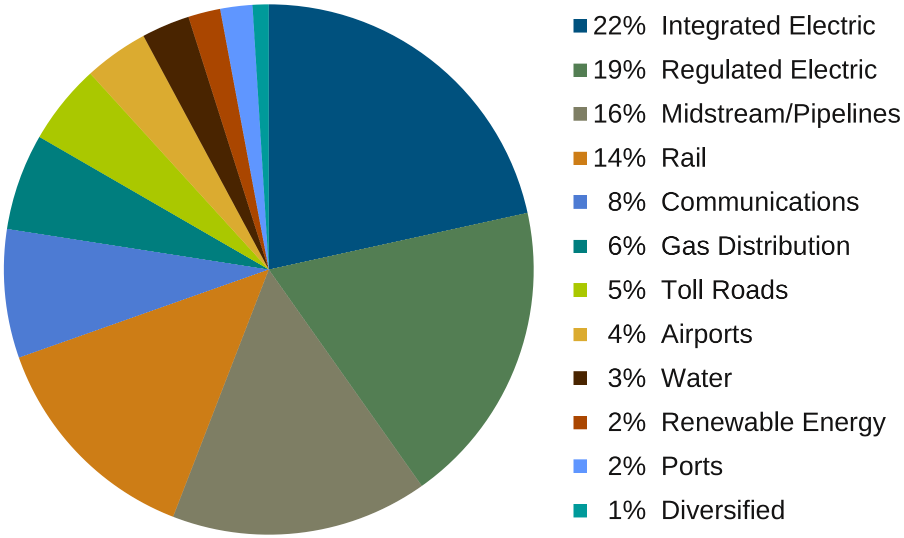
Listed Infrastructure Market Capitalization ($3.8 trillion, 376 companies)

Utilities and Midstream/Pipeline investments represent the bulk of investments

By Region



By Sector



Source: CBRE Clarion Securities, March 31, 2019

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Infrastructure as an Investment

Spotlight on Infrastructure

Investment in infrastructure may offer key benefits

Access to long-lived assets which are hard to replicate and offer a range of defensive income streams, monopoly market positions with high barrier to entry or regulated markets

Typical sectors for investment: Energy, Renewables, Water/Waste, Transport, Communication and Social

Most managers focus on global developed markets, typically Organisation for Economic Co-operation and Development (“OECD”) markets

Global or non-U.S. funds provide exposure to non-dollar currencies and can serve as a further hedge against inflation as well as declines in the U.S. dollar

Some risks to consider

Some assets may become less-defensive as consumer demand, regulation or the competitive landscape changes

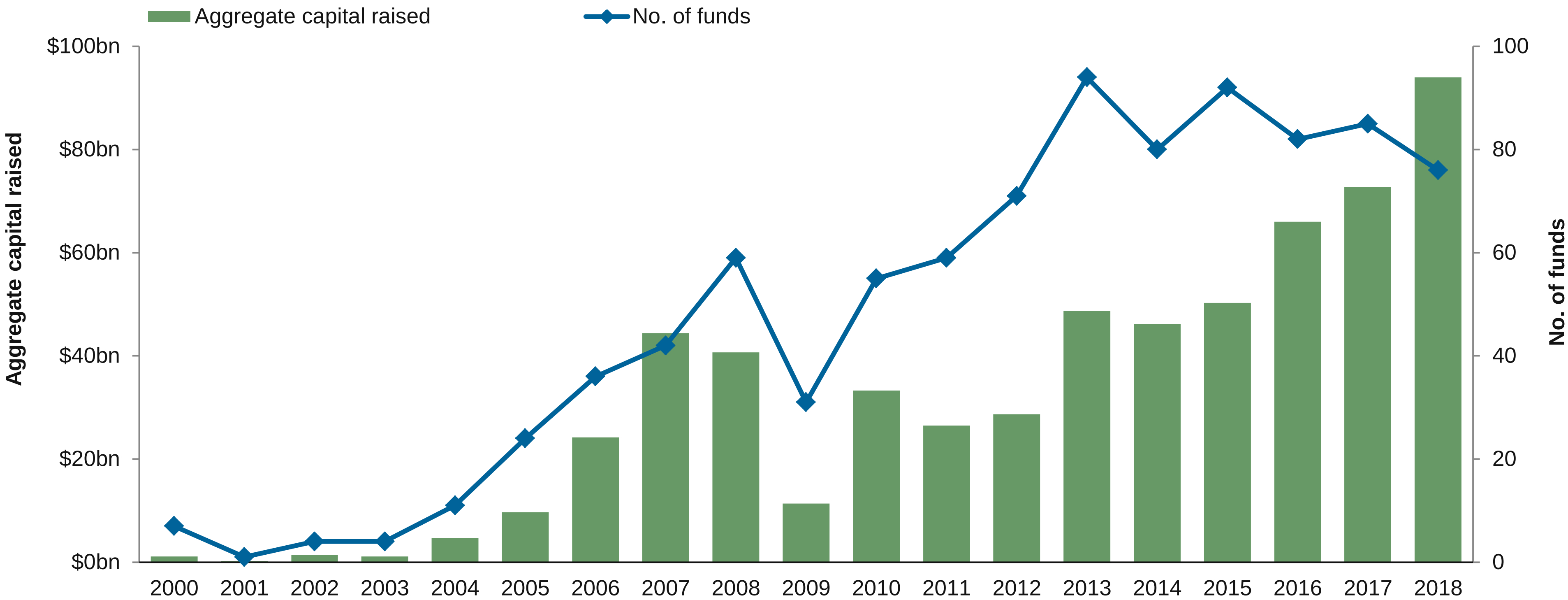
Interest-rate movements could have significant impact on the value of assets, depending on the level of leverage

Currency movements can negatively impact portfolio performance, hedging can be costly

The flexibility to invest in infrastructure could offer further diversification, enhanced return opportunities, or both

Private Infrastructure Fundraising Momentum Continues

Infrastructure strategies are raising significant capital



Open-end infrastructure managers secured substantial new commitments in 2018 and several new funds have been launched.

The variety of closed-end infrastructure products continues to increase with new offerings in debt and Emerging Markets-focused strategies.

Source: Preqin

Key Asset Characteristics To Evaluate Infrastructure Assets

Hard asset

Long-life asset

Provides essential economic or social services

Monopolistic or near-monopolistic in nature

High barriers to entry

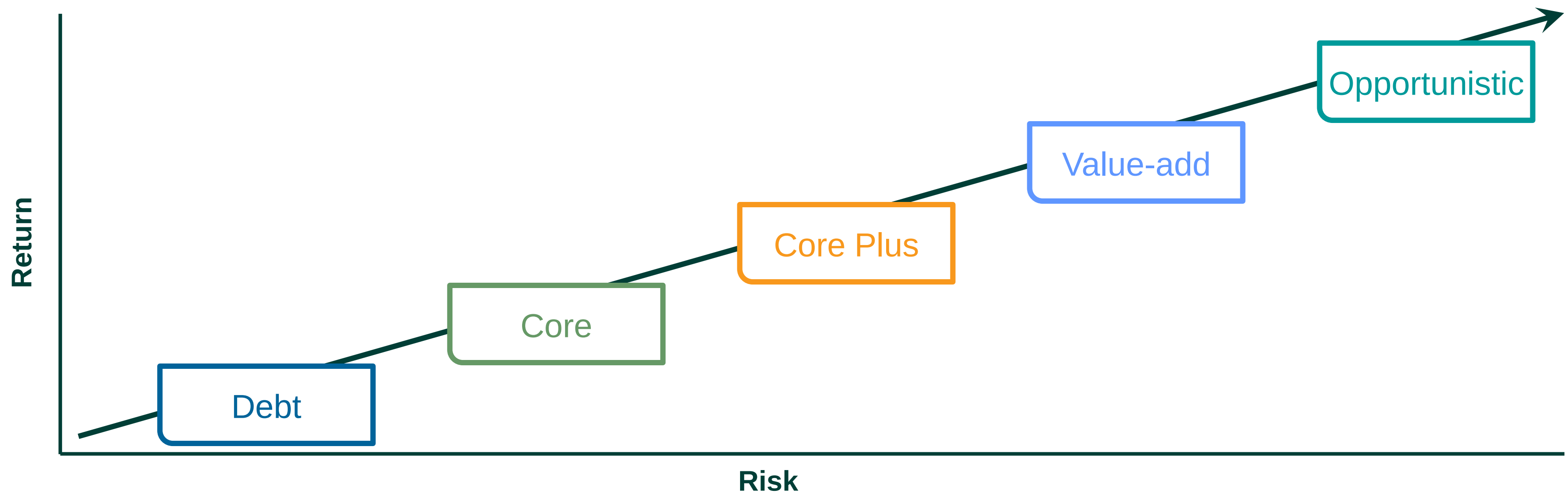
Low demand elasticity

Stable cash flow

Illiquid underlying assets

High leverage

Infrastructure – Relative Risk/Return



	Debt	Core	Core Plus	Value-add	Opportunistic
Net Return estimate	Typically 3-5% over a fixed rate such as LIBOR. Higher return strategies too	5-7%	8-10%	10-12%	13%+
Asset	Asset level Corporate level	Stable asset	Existing asset	Enhancement of existing asset	Development of a new asset
Cash flow to investors	Interest payments	Regular distributions from operating cash flow	Semi-regular distributions from operating cash flow	Cash flow may be reinvested into the assets and not paid to investors until the enhancement is complete	No cash flow during the development of the asset, which may take 3-10 years depending on the type of asset and complexity to develop
Investment stage	Debt	Brownfield	Brownfield	Brownfield	Greenfield

Infrastructure Investing Structures

Similar vehicle types as equity real estate

	Open-End Funds	Closed-End Funds
Strategy	Core, Core Plus	Core Plus Value Add Opportunistic
Investor Control	Limited	Limited
Liquidity	Moderate - Quarterly Liquidity	Low Fund Terms of 10+ Years
Diversification by Sector Type and Geography	Moderate - High	Varying depending on strategy and market-focus
Diversification by Number of Assets	Moderate - High Varies based on age of product	Varies based on size of fund and strategy
Monitoring by the Investor	Low – Moderate	Moderate - High
Fees	Moderate - High 0.75% – 1.25% of NAV Most have incentive fees	Moderate - High 1.25%-1.75% on committed or invested equity plus an incentive fee (typically 15-20% over a hurdle rate)
Returns	7-10+% p.a. Primarily from yield	10%+ IRR Primarily from appreciation. Yield may be available after the end of the investment period
Diversification Benefit to Overall Portfolio	Moderate	Moderate

Institutional Infrastructure Markets

More developed in non-U.S. markets, more U.S. investor products being created

North America only		Global / non-U.S.
3	**Open-End Fund Universe**	5-7
10-20+	**Closed-End Fund Universe**	30 – 40+
Most U.S. only funds are smaller and sector focused, increasing number of diversified products coming to market	**Markets & Market Quality**	Most common: OECD markets, Europe-focused Less common: Emerging markets
Renewables and energy are most prevalent, with an increasing number of diversified funds and other sector-focused funds (e.g. water, communications)	**Sector Types**	Renewables, transport, communication, utilities, water and waste, social
U.S. energy discoveries and clean power creating need for energy investment. Historic underinvestment and shrinking public budgets also create opportunity	**Key Drivers**	Global demand for clean power, historic public sector underinvestment, need for increased communications assets, greater history of public-private partnerships outside the U.S.
Managers who expand the definition of infrastructure to include private equity-like assets	**Key Risk Considerations**	Political instability; Currency fluctuations & stability; Variations in legal, tax, language, culture, etc.

- Expanding universe of managers and funds, including new product offerings and increased variety of products from existing managers
- Increasing number of infrastructure debt fund offerings following changes to banking regulations

Real Estate Debt

Spotlight on Real Estate Debt

Investment in real estate debt may offer key benefits

Potential downside protection relative to equity real estate interests

Potential for income-oriented return profile, primarily derived from property cash flows

Debt investments can provide a differentiated risk/return profile which can complement the equity capital stack

Inflation protection as floating-rate loans may track rising interest rates for well-positioned, well-located investments

Some risks to consider

No ability to participate in appreciation of the real estate value

Potential for non-payment and/or delayed payment of the loan

Debt investment performance can be varied, depending on the position in the capital stack and market timing

Fixed-rate loans will not track interest rate movements, which can be significant depending on the loan duration

A well-constructed debt investment could offer equity-like real estate returns with downside protection

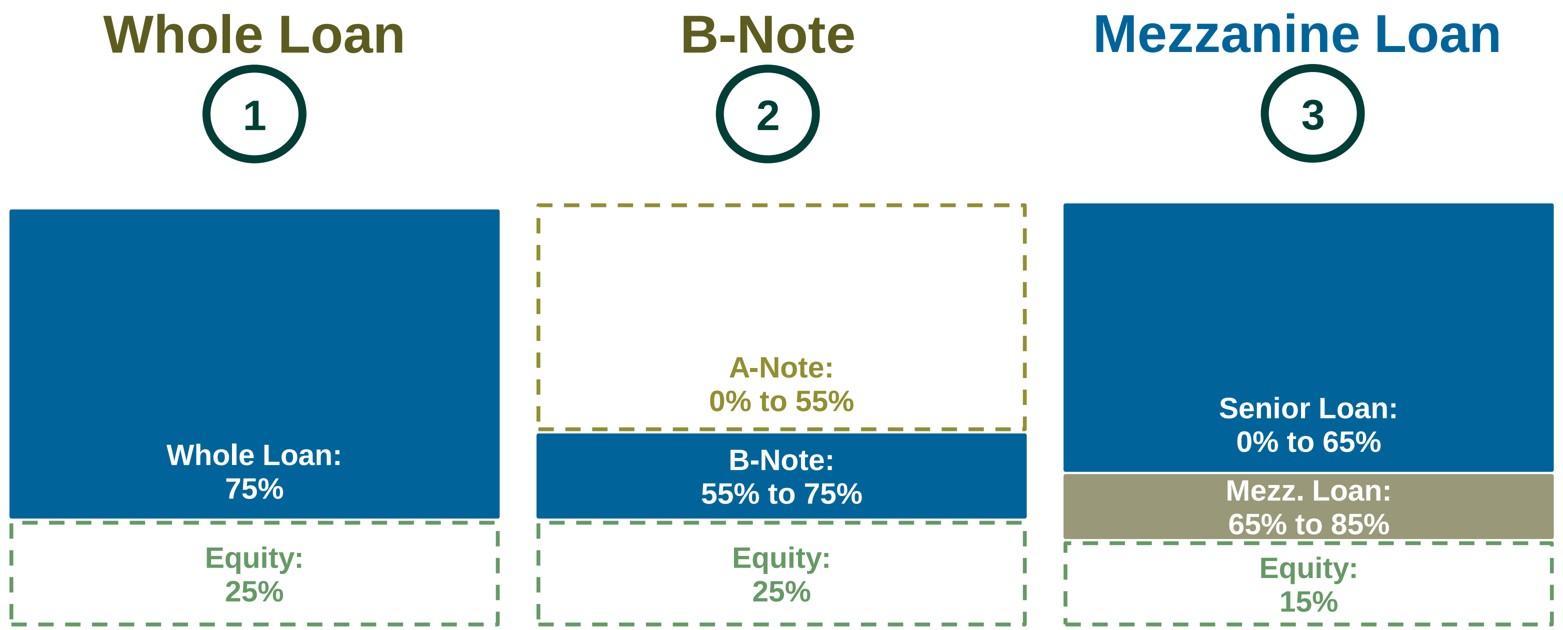
Real Estate Debt Overview

The four quadrants of real estate investment

	Private	Public
Debt	Senior mortgages, B-notes, mezzanine loans, preferred equity	Commercial Mortgage-Backed Securities (“CMBS”), Collateralized Debt Obligations (“CDOs”) and Mortgage REITs
Equity	Individual property ownership, unlisted funds and syndicates	Real Estate Investment Trusts (“REITs”) and Real Estate Operating Companies (“REOCs”)

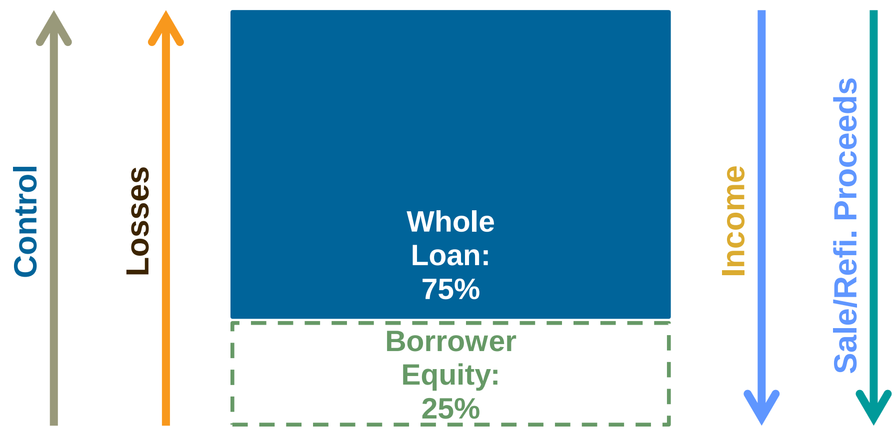
Illustrative Real Estate Capital Stack Alternatives

Each position in the capital stack has distinct characteristics and rights



Effective selection of the position in the capital stack is based on a variety of factors

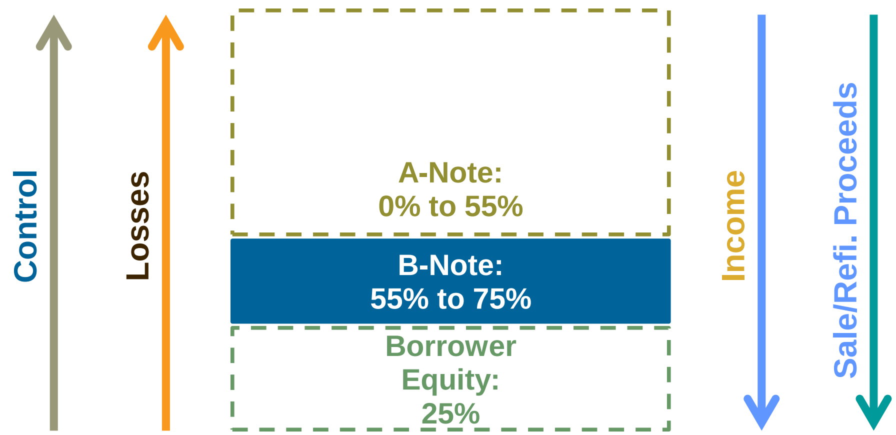
1 Characteristics of Investment Types – Whole Loan



Typical Characteristics	
Capital Stack Position	From 0% to ~65%-75% LTV
Priority of Claim	Highest
Capital Requirement	High
Pay Structure	Interest income, fees
Interest Rate	Floating- or fixed-rate
Investment Term	Typically up to 10 years

- A Whole Loan is a debt instrument collateralized by a first mortgage or deed of trust that encumbers an income producing property
- The whole loan is typically the senior-most position in the capital stack
- Investments receive a priority claim for interest income and repayment proceeds
- The primary source of income is rent paid by tenants that occupy the income producing property, enhanced by fee and servicing income

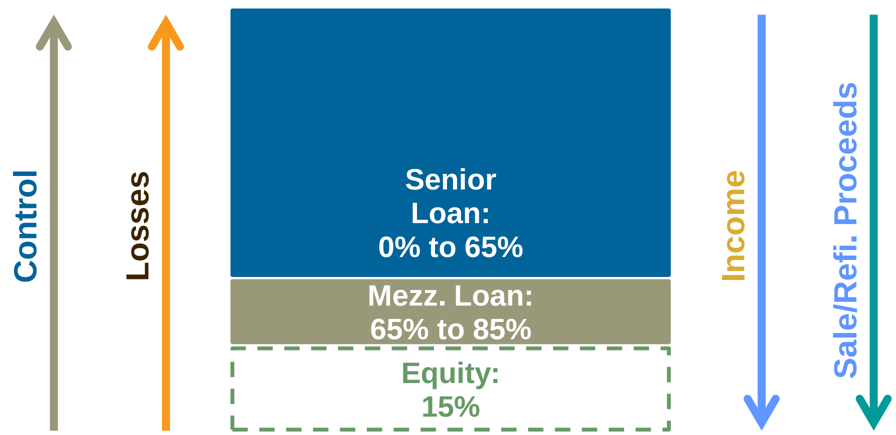
2 Characteristics of Investment Types – B-Note



Typical Characteristics	
Capital Stack Position	From ~55% to ~75% LTV
Priority of Claim	Moderate
Capital Requirement	Moderate
Pay Structure	Interest income, fees
Interest Rate	Floating- or fixed-rate
Investment Term	Typically up to 10 years

- A B-Note is created by originating a whole loan and selling a senior interest in that loan
- The B-Note holds a relatively senior position in the capital stack
- Investments receive an enhanced return by selling an A-Note at a lower yield
- The primary source of income is rent paid by tenants that occupy the income producing property; however, the A-Note holder receives income first

Characteristics of Investment Types – Mezzanine Loan



Typical Characteristics	
Capital Stack Position	From ~65% to ~85% LTV
Priority of Claim	Moderate to low
Capital Requirement	Moderate to low
Pay Structure	Interest income, PIK, fees
Interest Rate	Transaction specific
Investment Term	Typically 2 to 5 years

- A Mezzanine Loan is a debt instrument collateralized by a pledge of ownership interests in a property
- The mezzanine loan holds a relatively junior position in the capital stack and typically finances a transitional property that needs to be repositioned
- Higher return from income from rent paid by tenants and proceeds from a sale/refinancing
- Performance driven by market environment and success of repositioning

Debt Investing Structures

Similar vehicle types as equity real estate; different underlying assets

	Open End Funds	Closed End Funds
Strategy	Low to Medium risk profile	Medium to High risk profile
Investor Control	Limited	Limited
Liquidity	Moderate Quarterly Liquidity	Low Fund Terms of 10+ Years
Diversification by Property Type and Geography	Moderate	Varies based on size of fund and strategy
Diversification by Number of Loans	Moderate - High Varies based on tenure of investment vehicle	Varies based on size of fund and strategy
Monitoring by the Investor	Moderate	Moderate
Fees	Moderate 0.65% -1% of NAV No incentive fee	Moderate - High 1.0%-1.5% on committed or invested equity plus an incentive fee (typically 15-20% over a hurdle rate) Core Plus may not have an incentive fee
Returns	5-10%+ p.a. Primarily from yield	8-12%+ IRR Combination of yield and payoff at debt maturity
Diversification Benefit to Overall Portfolio	Moderate	Moderate

Real Asset Appendix

State of Global Infrastructure

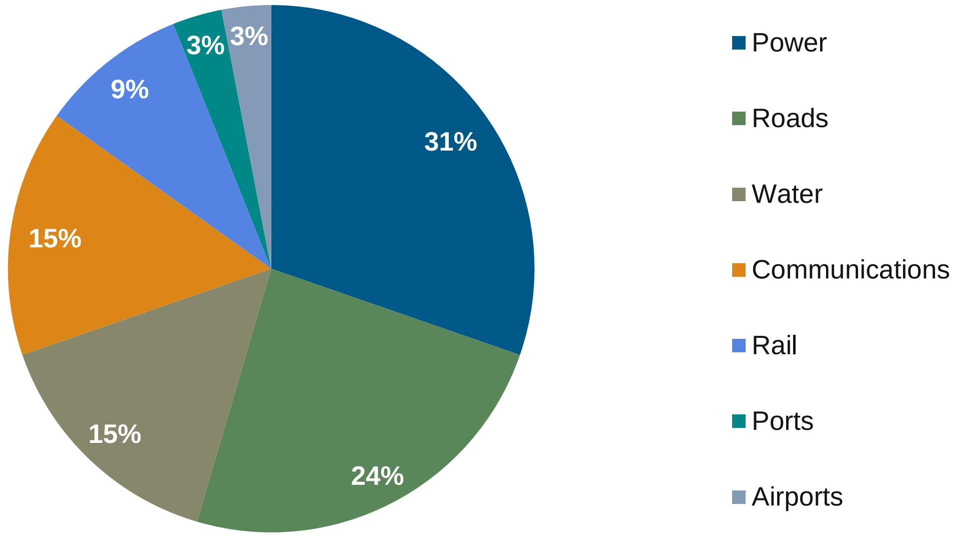
$3.3 trillion of global annual investment is required, only $2.5 trillion is invested

Since 2009, infrastructure declined as a share of GDP in 11 of the G20 economies.

$1 of infrastructure investment can raise GDP by 20 cents by increasing employment (construction) and ultimately productivity.

According to the American Society of Civil Engineers, there is a $2 trillion investment gap and they believe the U.S. must increase investment from all levels of government and the private sector from 2.5% to 3.5% of U.S. Gross Domestic Product (GDP) by 2025.

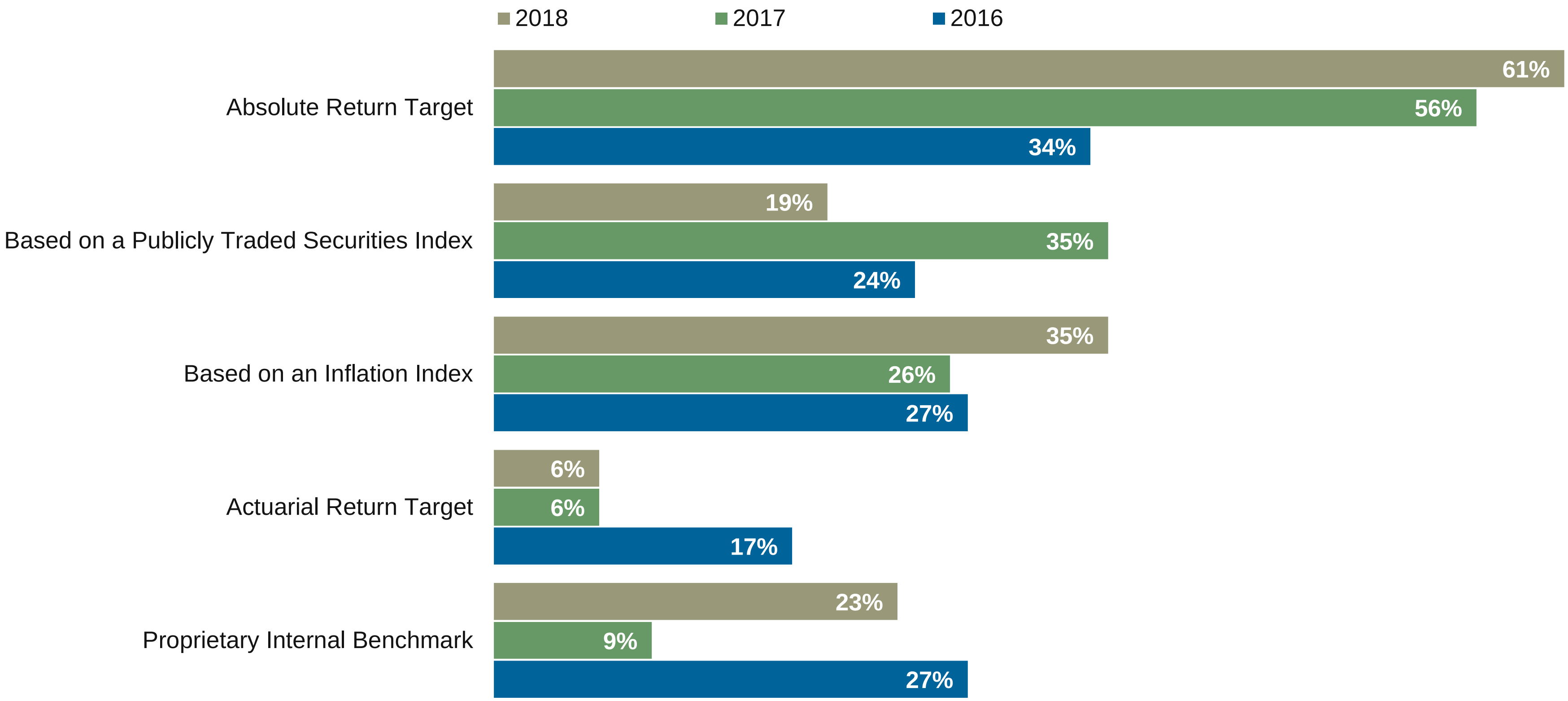
Global Investment Required (2016–2030)



Source: McKinsey Bridging Global Infrastructure Gaps, Full Report June 2016

The Sector is Still Developing, Benchmarking is Inconsistent

Absolute Return targets have gained ground in 2017 and 2018

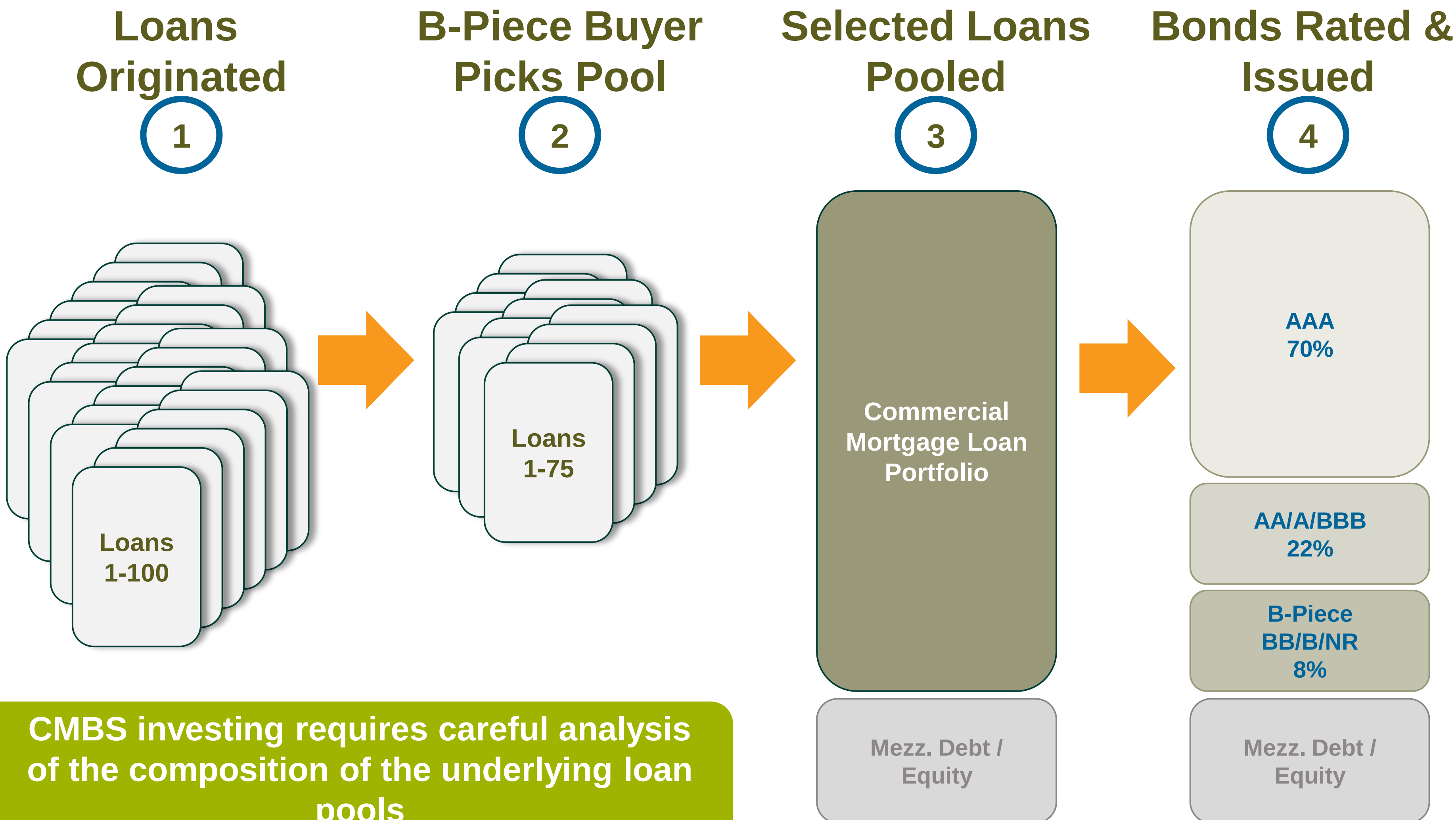


Absolute return benchmarks remain most popular, with significant numbers of investors also using a publicly traded securities index.

Source: Probitas, 2017 and 2018 Infrastructure Investor Survey

Commercial Mortgage-Backed Securities (CMBS) Overview

CMBS offers investors a relatively liquid alternative to real estate debt investment



CMBS investing requires careful analysis of the composition of the underlying loan pools

Loan Terminology

Speaking the language of debt

Bridge Loan	• Short-term loan with a three to five year term. • Rates may be fixed or floating.
Construction Loan	• A loan to fund up to 100% of construction costs of a property. • May be made in conjunction with a commitment by the lender for a permanent loan upon completion
Conduit Loan	• Commercial real estate loan made to ultimately be securitized via CMBS.
Conduit Lender	• Makes conduit loans and holds the loans until they can be securitized as CMBS. • Can be insurance companies, banks, pension funds, financial services firms, investment banks, and other types of lenders.
Permanent Loan	• Senior loan, whole loan, conduit loan, participating mortgage, or otherwise long-term financing of a property.
Repurchase Loans	• Repo loan. • A short-term loan, often made overnight, in which the lender lends cash to a borrower in exchange for bonds with the borrower agreeing to repurchase the bonds later at a higher price.
Whole Loan Commercial Mortgage	• Debt instrument collateralized by a first mortgage or deed or trust that encumbers an income producing property. • Whole loans are not securitized.

Loan Terminology

Speaking the language of debt

Fixed Rate Loan	• Rate of interest is fixed and remains the same for the entire term of the loan
Floating Rate Loan	• Rate of interest fluctuate over the term of the loan and is based on a spread over a benchmark • E.g. LIBOR plus 200 basis points
Interest Only Mortgage (I/O)	• A loan where the borrower's periodic payments are only interest payments. • Principal is paid when the loan is paid off or amortization with interest and principal payments may begin during the loan term after the I/O period.
LIBOR	• London Interbank Offered Rate • Rate banks charge each other for short-term loans. • Interest rates on real estate loans can be based on a spread over LIBOR.
Loan to Value (LTV)	• Loan amount divided by the property value. • Used by lenders to judge the safety of the loan. • Property value may be measured by appraised value, as determined by a rating agency or the lender. • A LTV of less than 100 can reduce the borrower's motivation to continue making mortgage payments.
Debt Service Coverage Ratio (DSCR)	• Measures the ability of a property to pay for all mortgage related payments. • Calculated as Net Operating Income divided by Total Debt Service. • A key metric used by lenders, along with LTV, to judge the safety of a loan. • Breaching a minimum DSCR is a condition of default in many loan documents.

Loan Terminology

Speaking the language of debt

Term	Definition
Payment in Kind (PIK)	• Represents interest that may be deferred at the option of the borrower. For example: a loan with an interest rate of 8% comprised of 5% current pay and 3% deferred interest (the PIK)
Transitional Asset	• A property undergoing a value-add program, such as leasing, renovation, or repositioning, or a property in a location where fundamentals are weaker than prime markets.
Collateral	• Security pledged for the payment of a loan.
Fannie Mae	• Federal National Mortgage Association is a public government sponsored enterprise that provides financing in the housing sector. • Securitizes mortgage loans • Referred to a an Agency Lender
Freddie Mac	• Federal Home Loan Mortgage Corporation • A public government sponsored enterprise that provides financing in the housing sector. • Securitizes mortgage loans • Referred to a an Agency Lender
Foreclose	• The process of taking possession of a mortgage property as a result of the mortgagor’s failure to make mortgage payments.

Private Equity

Agenda

Private Equity Discussion Topics

Private Equity Definition

Benefits and Challenges

Institutional Investor Usage

Strategy Types

Market Size and Composition

Investment Structure and Cash Flows

Return Characteristics

Program Implementation

Summary

Appendix

Introducing Private Equity:

Rationale, Pros, and Cons

Definition: Private unlisted investments in operating companies, typically accessed through limited partnerships

Private equity is an additional tool that investors can employ to finance a future payment stream

It provides a differentiated return stream and diversification

Addresses a different opportunity set – private companies

While commonly viewed as a separate asset class, it is an extension of equity

The key benefit sought from private equity is to earn a rate of return in excess of the returns of publicly stocks and bonds

The primary drawbacks are illiquidity and program complexity

Private Equity is Different from Public Equity—a Plus

Rationale, Pros, and Cons

Similarity: Revenues - Expenses = Earnings

Control over value-improvement is the key differentiator from public equities

Private equity market is fragmented (no central marketplace) and partially regulated

- Creates opportunities for GPs with skill to add value

Active execution and control of value-creation plans

- Grow companies fast, use leverage to the degree applicable
- Bring best resources to companies, management, boards, and customers

Investors and management in partnership

- Substantial investment, opportunity for financial independence

Managed for long-term gain, not quarterly earnings

- Different objectives and incentives from public companies

Privately negotiated pricing and financing structures

- Private pricing is generally lower than public pricing
- Companies are financed to maximize equity value (e.g., more debt)

Challenges of Private Equity

Private equity is illiquid

Implementation is a primary risk and critical to success

- Inefficiencies can work for or against investors, below median returns are not adequate
- Mistakes are long-lasting, cannot be easily liquidated
- Professionally managed portfolios mitigate much of this risk

Program complexity

- Takes five or more years to become fully funded
- Ongoing implementation – periodic reinvestments are required

Return calculation and benchmarking methodology differs from public securities, and performance data is not publicly available

- Minor learning curve for investors

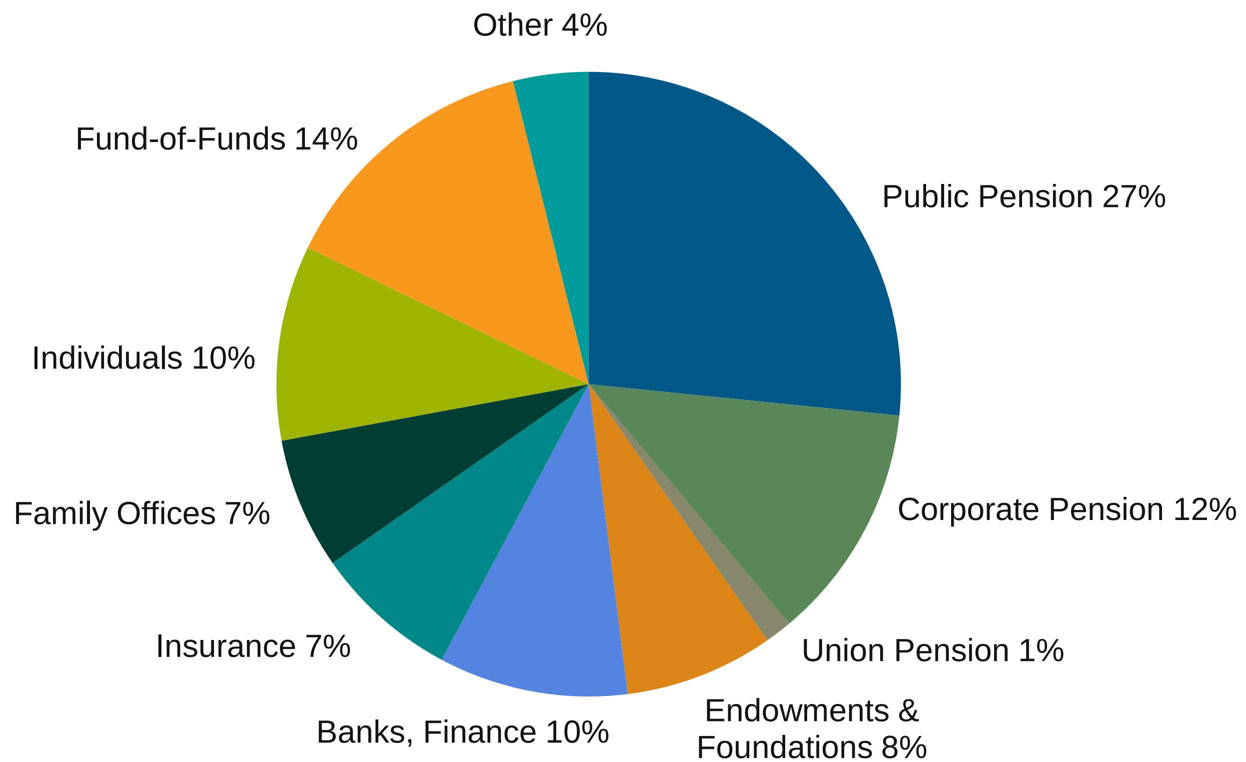
The J-curve effect can potentially detract from short-term performance

- Returns and asset values take time to develop (negative early returns)
- Risk: Individual company investments fail

Fees are high in relation to the fees for managing portfolios of publicly traded securities

- Fund-of-Funds fees are 65 basis points to 85 basis point based on commitments
- Underlying partnership fees and carried interests are approximately 230 basis points based on commitments

Sources of Private Equity Partnership Commitments



Public pension plans are the largest investors in private equity being over 25%

Tax-exempt plans constitute about half the market, and institutional investors make up approximately 80%

Five Types of Private Equity Strategies

Private Equity Addresses a Full Spectrum of Corporate Financing Needs

Venture Capital

- Nascent growing companies in technology, health care, retail and other large market sectors
- Early-, Multi-, Late-Stage

Buyouts

- Mature businesses in traditional industries
- Mega, Large, Middle-Market, Small

Special Situations

- Tend to be larger company corporate finance funds that fall outside other categories (“Other” segment)
- Industry-Focused, Multiple-Strategy, Secondary

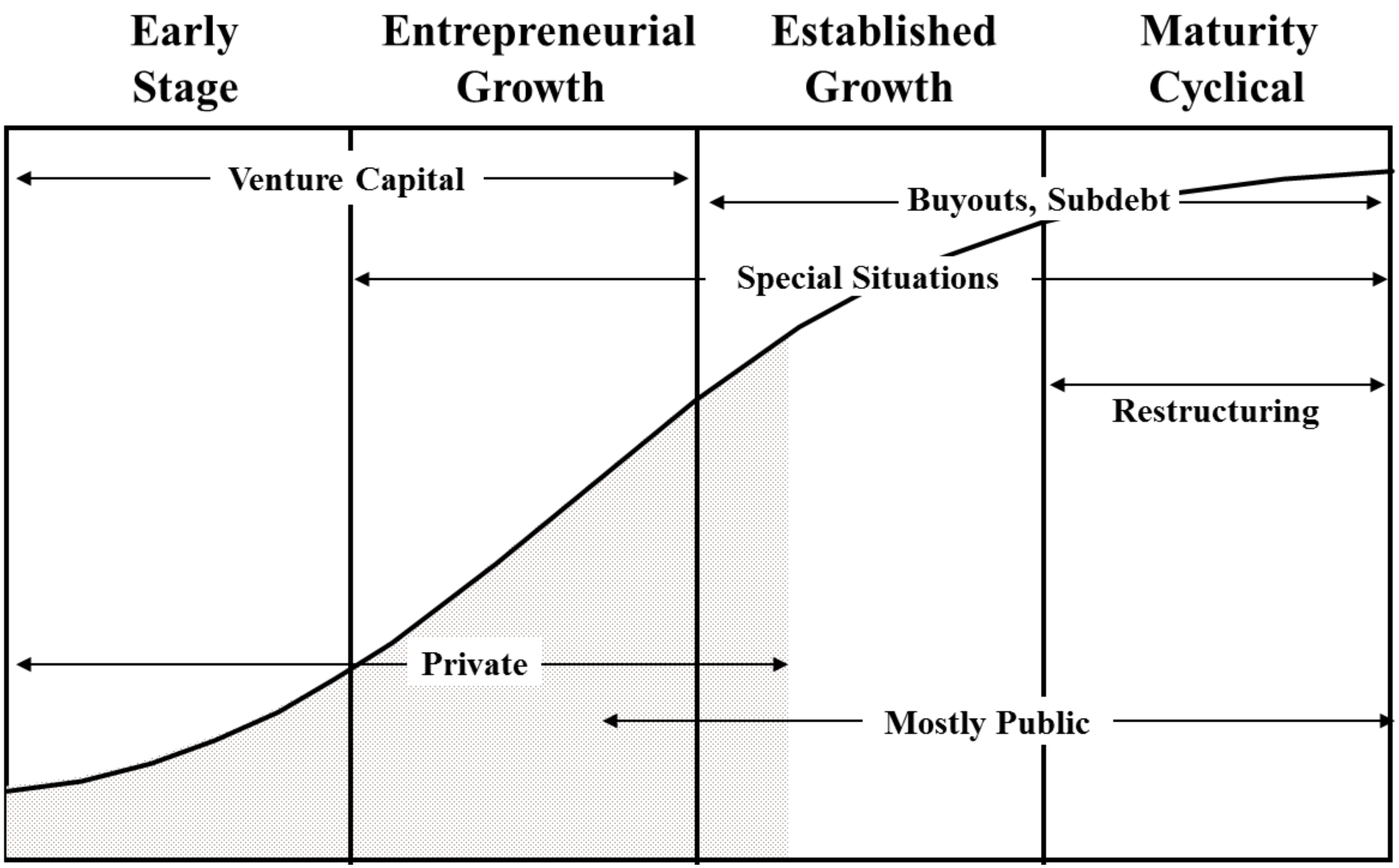
Subordinated Debt

- Private high yield debt with equity participation
- Large, Small / Captive, Independent

Distressed Debt/Restructuring

- Rejuvenate good companies that have financial woes, generally large traditional mature companies
- Senior Secured, Equity Infusion

Corporate Growth & Private Finance Cycle



Annual U.S. Private Equity Fund Formation

Historical Commitments to U.S. Private Equity Funds

Number of Funds

Strategy	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	# Total	%
Venture	150	123	119	135	154	205	307	281	439	531	535	2,979	**42%**
Buyouts	114	104	110	154	167	224	305	263	298	373	357	2,469	**35%**
Subdebt	17	20	27	29	26	33	33	28	25	86	88	412	6%
Restructuring	29	30	28	21	25	43	33	37	36	31	34	347	5%
Other/FOF	53	58	52	65	54	87	87	73	74	134	122	859	12%
Total	363	335	336	404	426	592	765	682	872	1,155	1,136	7,066	100%

$ Amount (in millions)

Strategy	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	# Total	%
Venture	24,729	13,162	11,636	16,216	20,273	19,661	32,968	34,274	44,030	37,371	55,474	309,793	**12%**
Buyouts	130,884	39,552	34,955	75,286	92,798	125,544	174,783	169,694	184,538	227,387	246,902	1,502,322	**59%**
Subdebt	40,202	3,262	6,224	4,729	10,775	14,502	8,663	12,535	22,481	36,721	31,089	191,182	8%
Restructuring	49,978	14,206	18,364	11,462	21,510	36,644	22,613	22,573	29,093	30,466	23,524	280,432	11%
Other/FOF	19,675	25,733	15,160	14,699	15,083	20,205	27,175	17,597	32,015	30,134	35,077	252,553	10%
Total	265,468	95,915	86,339	122,392	160,439	216,556	266,201	256,673	312,156	362,078	392,065	2,536,282	100%

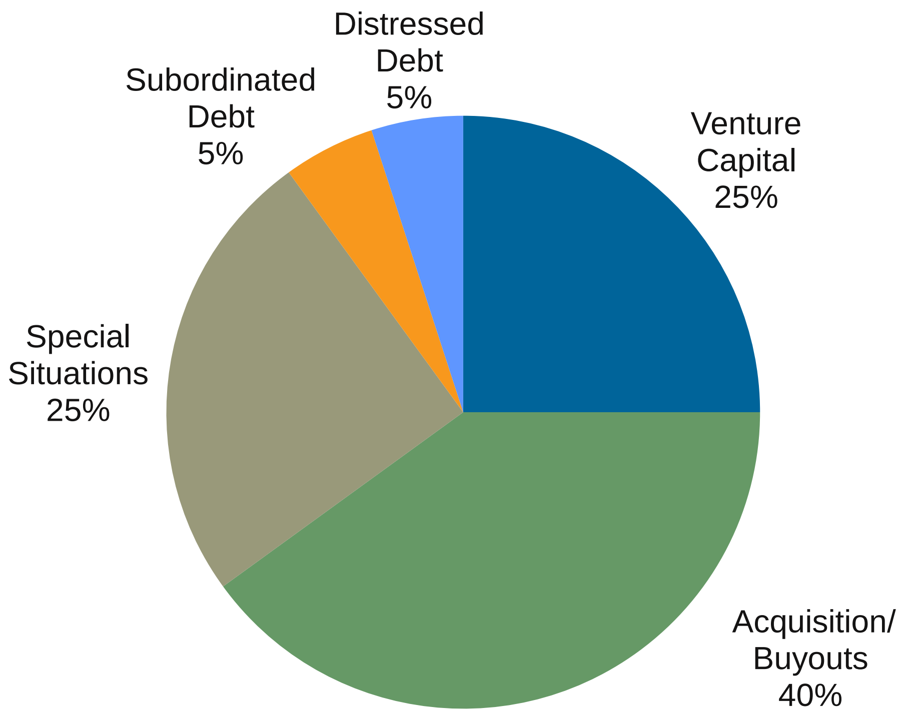
Source: Private Equity Analyst

- The domestic institutional private equity investment opportunity set averaged about 577 partnerships and $222 billion annually over the last decade.
- International partnerships represent about 35% of the global opportunity set.

Source: Private Equity Analyst

Typical Fund-of-Funds Portfolio

Institutional Baseline Portfolio Structure



Strategy	% Target
Venture Capital	20 - 30%
Acquisition/Buyouts	30 - 45%
Special Situations	20 - 30%
Subordinated Debt	0 - 20%
Distressed Debt	0 - 20%

- An adjusted-market portfolio reflects the most common approach for manager-of-managers vehicles
- Diversification provides greater portfolio return stability as individual strategies have cycles
- International component is typically between 25% to 40%

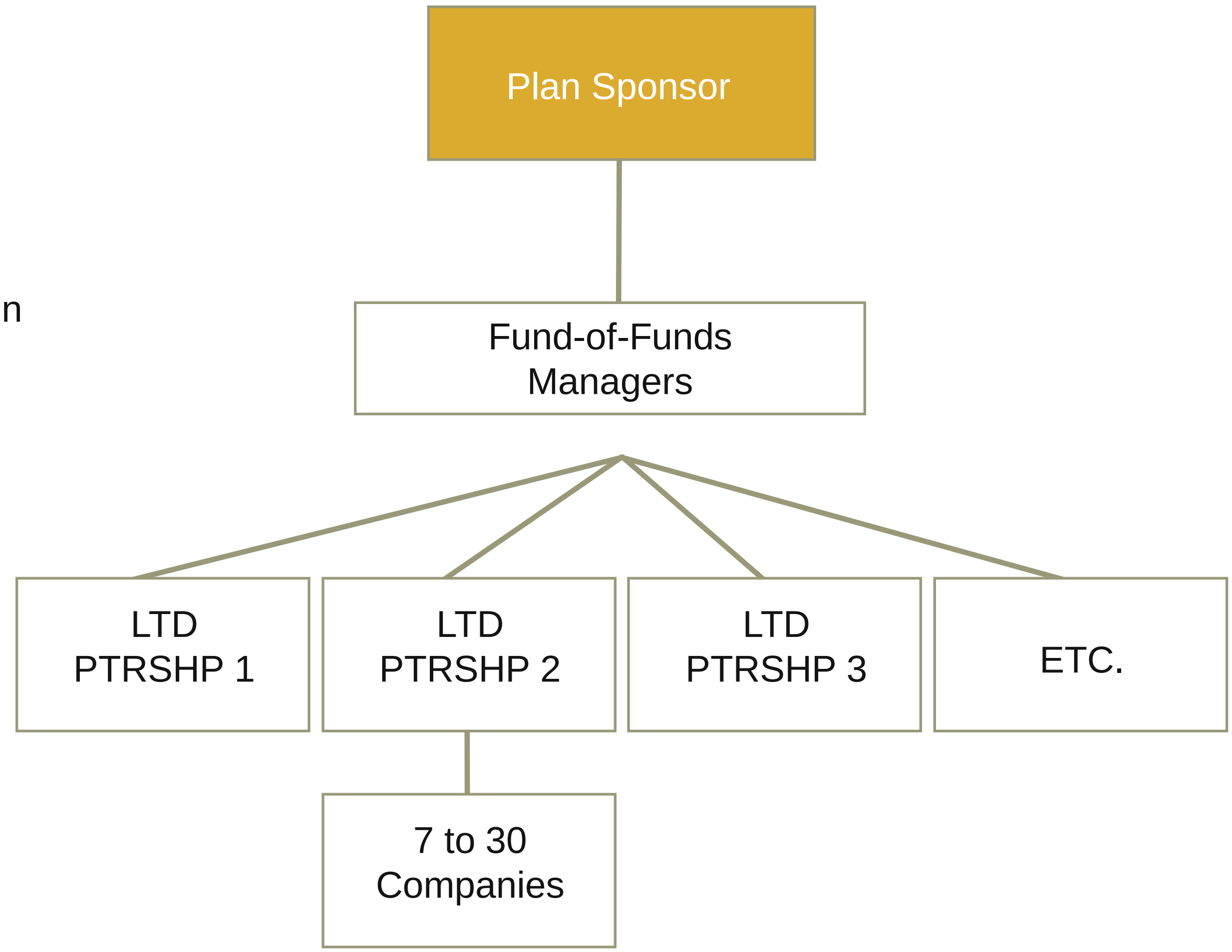
Private Equity Partnerships Program Structure

Policy
Strategic Planning
Performance Evaluation

Proactive Security Selection
Active Management
Reporting

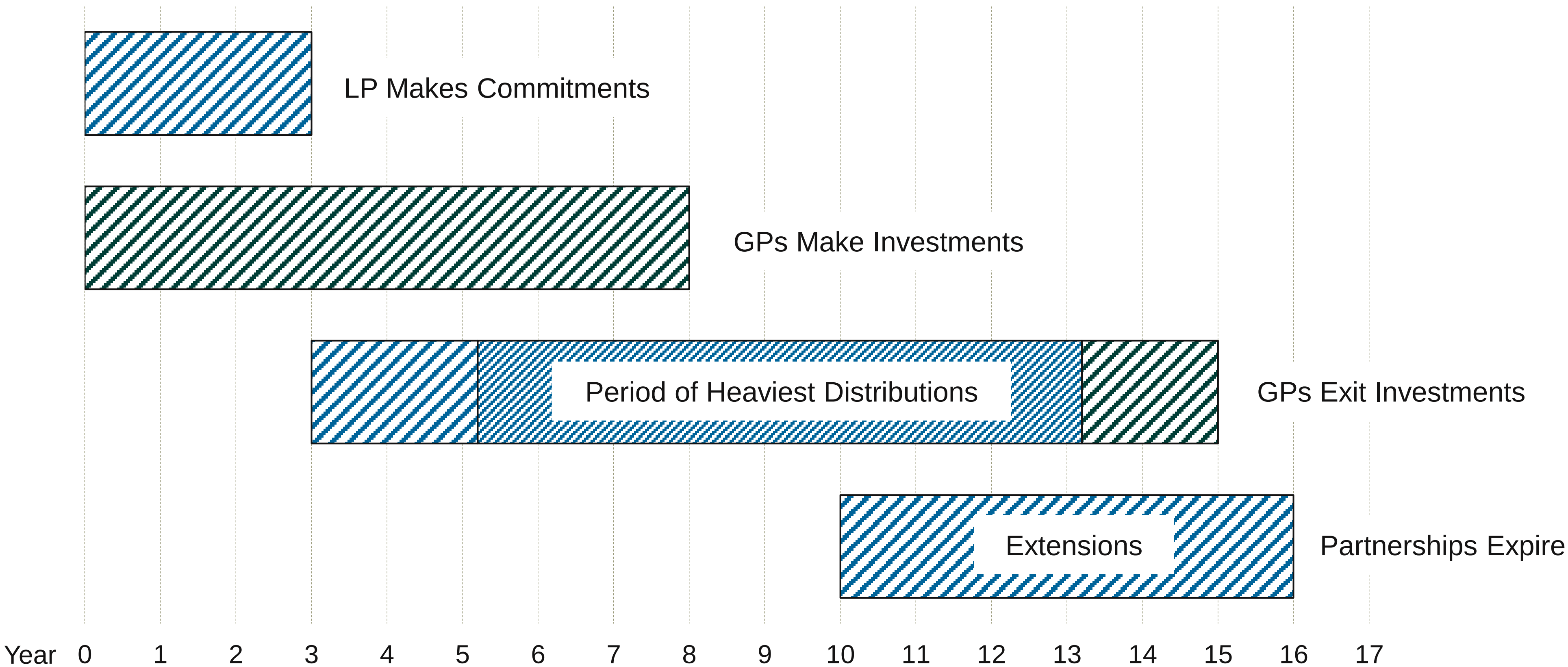
Mini-Conglomerate
(Security)

Divisions



Private Equity Investment Timeline

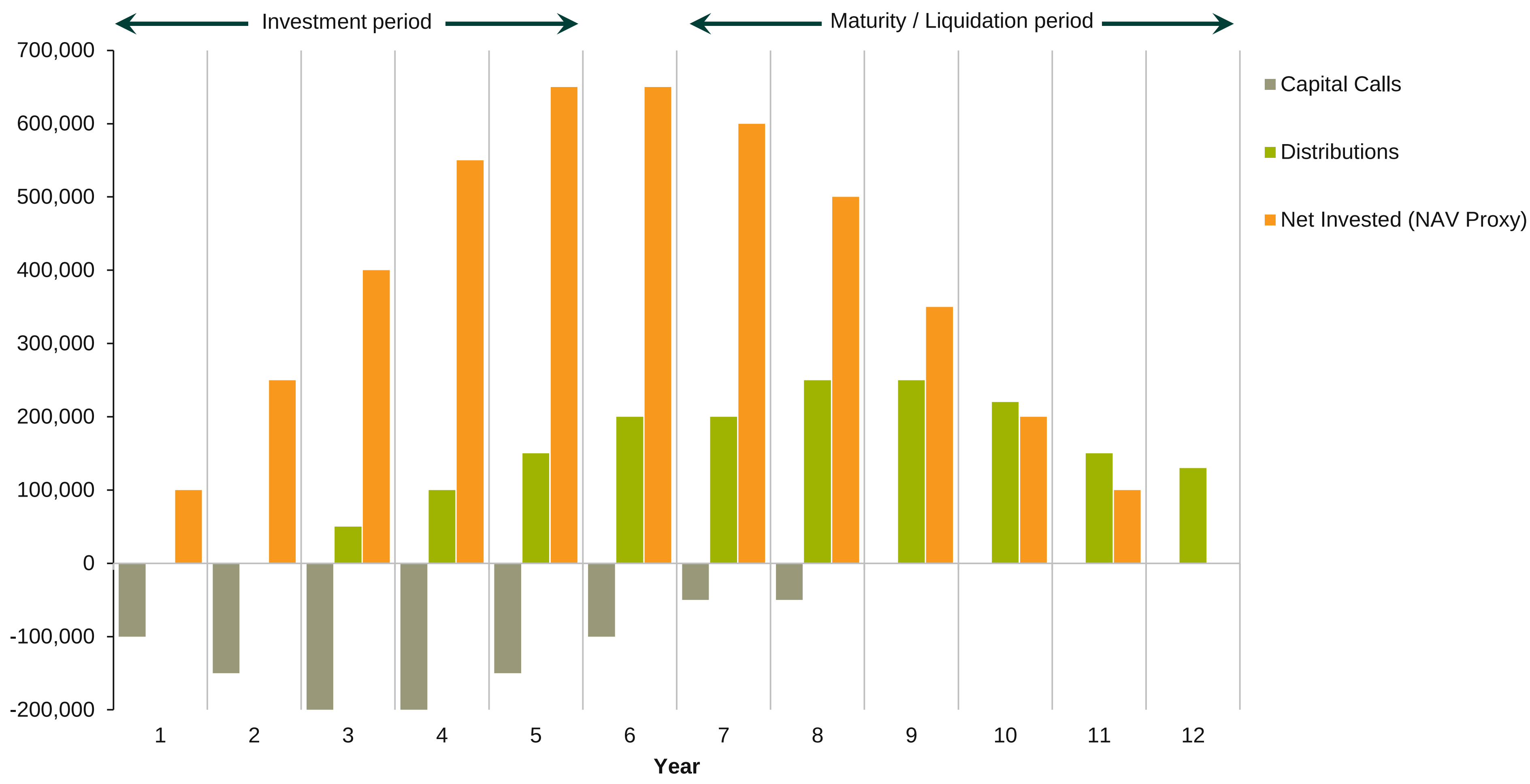
Private equity is illiquid and requires a long-time horizon
Decisions made today last 15 years or more



Source: *Private Equity Analyst*

Private Equity Cash Flows and Net Asset Value

Yearly cash flow and NAV for a $1 million partnership (or vintage year) commitment



Private Equity Returns: Why Bother?

Private Equity Performance Database – Pooled Horizon IRRs
Through December 31, 2018 – Returns are net of fees

Strategy	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
All Venture	18.7%	10.6%	14.3%	13.5%	11.1%	17.3%
All Buyouts	8.4%	14.6%	12.1%	14.3%	13.7%	12.2%
Mezzanine	9.7%	11.7%	10.5%	10.8%	10.0%	8.9%
All Private Equity	**10.7%**	**13.1%**	**11.9%**	**14.0%**	**12.7%**	**12.7%**
S&P 500	-4.4%	9.3%	8.5%	13.1%	7.8%	5.6%

Source: Refinitiv/Cambridge and Callan

There can be large return differences between strategy types over time

- Each strategy has contributed to success at various times

Venture Capital struggled for about 10 years following the technology bust, but it has recently experienced a resurgence

“All Private Equity” outperforms public stocks in the longer horizons

- Approximately 3% or more depending on the period

Proper Implementation is Critical

Dispersion of returns is high

Returns below median are unattractive

Poor choices last a long time

Private Equity Funds Formed 1985 – 2018 (as of 012/31/2018)

Strategy	Median IRR	Upper Quartile IRR
Venture Capital	8.0%	19.1%
Buyouts	11.9%	19.9%
All Private Equity	9.8%	18.6%

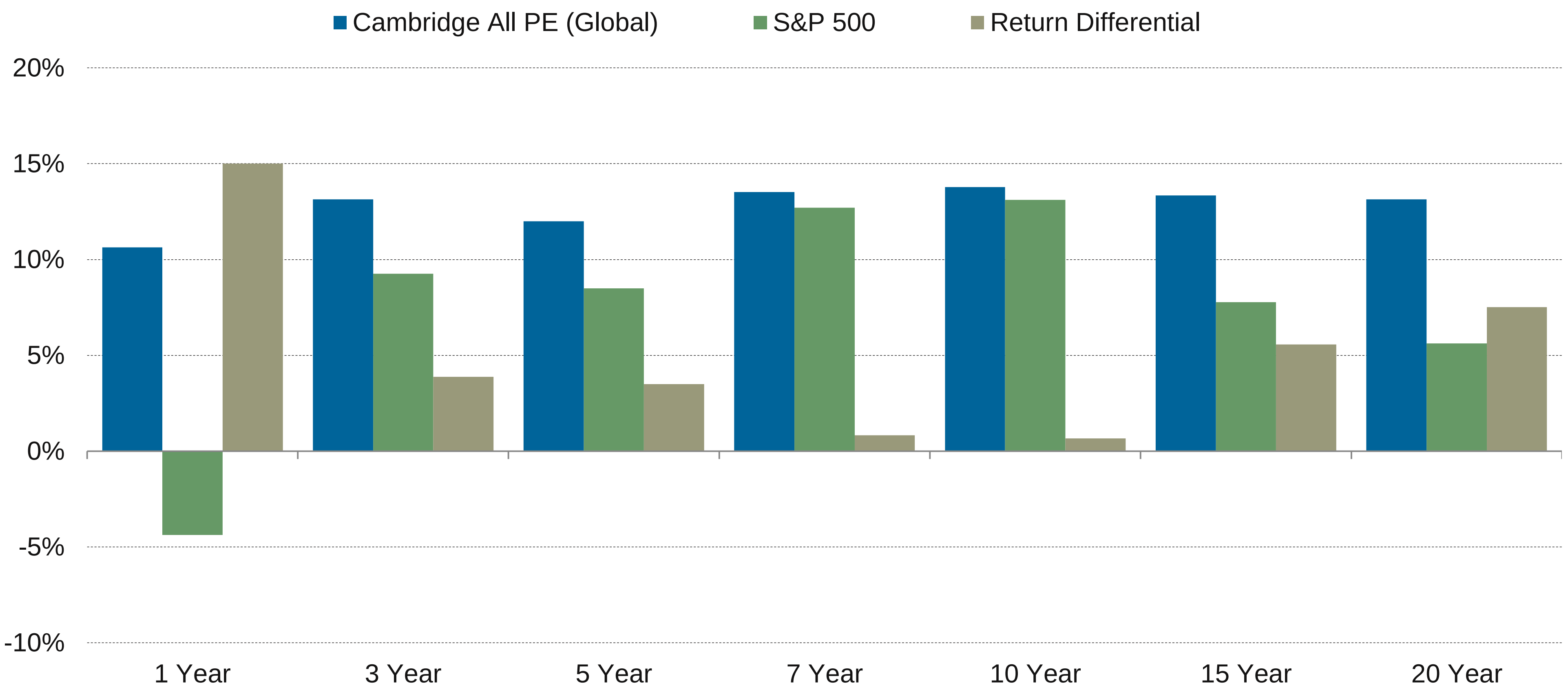
Public Index Comparables		
S&P 500 Stock Index	10.9%	
Bloomberg Barclays Aggregate Bond Index	6.8%	

Source: Refinitiv/Cambridge and Callan

Private Equity Returns

Time-Weighted Horizon Periods

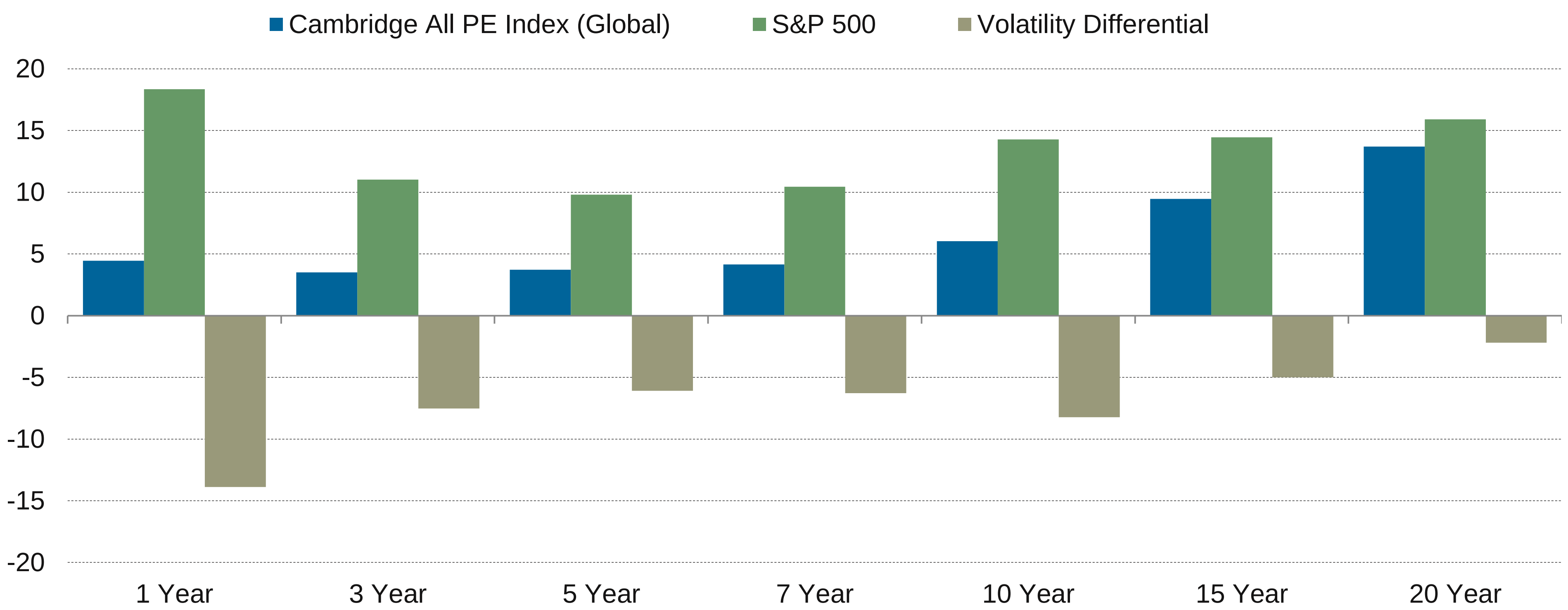
Private Equity versus Public Equity Performance as of December 31, 2018



- Time-weighted return premium is attractive typically over longer time periods

Private Equity Standard Deviation

Private Equity versus Public Equity Standard Deviations as of December 31, 2018



Volatility dampening effect can be significant, particularly in declining markets

PE's relative risk-adjusted return (return / standard deviation) is positive in all periods except one year

Implementation/Search

Fund-of-Funds

Starting universe of about 100 “gatekeeping” organizations

- Smaller institutional “oligopoly” (approximately 15 firms)

Mandates can be broad or specialty

Evaluation is both Quantitative and Qualitative

Access to established partnerships and amount of venture capital is an important differentiator

Objective screening criteria:

- Organization
- Experience
- Staffing
- Asset base
- Client base
- Access to top-tier partnerships
- Investment breadth and experience
- Investment strategy
- Investment process
- Allocation process
- Performance track record
- Fees
- Vehicle, terms and conditions

Private Equity Overview Summary

Defined Private Equity as private corporate finance investments

Key benefit sought is high rate of return, other benefits are secondary

Reviewed benefits and challenges

Usage by institutional investors is becoming very common, especially among public funds

Examined five key strategies:

- Venture Capital, Buyouts, Special Situations, Subordinated Debt, Distressed Debt

Market is large and robust with accessible pool of attractive investments across strategies

Reviewed institutional portfolio structure and cash flow characteristics

Examined return history which has delivered a return premium

Discussed manager universe and implementation

Private Equity Appendix

Sample Range of Private Equity Allocations

Plan Sponsor	% Target	$ Target
CALPERS	15%	$33.6 billion
Washington S/B	25%	$16.7 billion
NY State Common	10%	$12.7 billion
Utah Retirement Systems	7%	$1.5 billion
General Electric Pension Trust	7%	$3.5 billion
Boeing Company Pension Plan	6%	$4.4 billion
Indiana Public Retirement System	25%	$5.3 billion
Texas ERS	7%	$1.7 billion
Regions Bank Pension	5%	$72 million
Dartmouth College Endowment	27%	$22 million
The Clayton Foundation	8%	$17 million

64% of institutional investors have private equity allocations per the 2012 Russell Global Survey of Alternative Investing.

Source: Money Market Directory and Callan Associates

Private Equity Returns

Diversification Matters

Annual Return for Venture Economics Fund Indices (2003-2018)

Ranked in order of performance (Best to Worst)

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Buyouts 25.3%	Buyouts 29.3%	Buyouts 27.6%	Buyouts 39.1%	Buyouts 29.4%	Mezzanine -3.1%	All Private Equity 17.3%	Buyouts 19.6%	Mezzanine 13.2%	Buyouts 15.4%	Venture Capital 24.6%	Venture Capital 18.4%	Venture Capital 11.7%	Buyouts 11.9%	Buyouts 23.4%	Venture Capital 18.6%
All Private Equity 18.5%	All Private Equity 24.3%	All Private Equity 21.7%	All Private Equity 32.1%	All Private Equity 26.7%	Venture Capital -19.9%	Buyouts 16.5%	All Private Equity 18.8%	Venture Capital 9.2%	All Private Equity 14.0%	All Private Equity 21.1%	All Private Equity 11.7%	All Private Equity 8.6%	Mezzanine 9.5%	All Private Equity 19.7%	All Private Equity 10.6%
Mezzanine 15.1%	Venture Capital 14.8%	Mezzanine 13.3%	Venture Capital 19.6%	Venture Capital 19.9%	All Private Equity -26.7%	Venture Capital 9.1%	Venture Capital 18.2%	All Private Equity 7.3%	Mezzanine 12.8%	Buyouts 20.6%	Mezzanine 11.1%	Buyouts 8.5%	All Private Equity 9.1%	Mezzanine 15.1%	Mezzanine 9.7%
Venture Capital 1.9%	Mezzanine 8.9%	Venture Capital 11.0%	Mezzanine 16.3%	Mezzanine 13.7%	Buyouts -29.4%	Mezzanine 6.8%	Mezzanine 9.2%	Buyouts 7.2%	Venture Capital 8.9%	Mezzanine 13.0%	Buyouts 9.5%	Mezzanine 5.2%	Venture Capital 1.0%	Venture Capital 13.5%	Buyouts 8.3%

Source: Thomson/Cambridge

Each strategy takes its turn at the top, middle, and bottom

Venture has produced the highest returns but is the most volatile

Buyouts has less volatility, but returns are lower than venture capital

Mezzanine has proven a good defensive strategy and contributed to returns

The market-weighted “All Private Equity” portfolio has been most consistently strong

Implementation

Search Process

Develop Search Package

- Profile of Client and Mandate, Search Criteria, Callan Questionnaire, Draft Guidelines
- Reviewed by Staff and Callan Consultants

Callan and Staff review Callan's universe of providers

- Select appropriate roster of firms to receive search package
- Can advertise in P&I and elsewhere if desired

Managers have four weeks to respond to questionnaire

Review responses and select firms to interview

- Can be a one step or two step process and may include on-sites
- Callan can work with Staff or independently throughout the process, as desired

Review by Callan Manager Search Committee

Schedule finalist candidate presentations to the Investment Committee

Legal review and closing

Process usually takes four months to finalist presentations

Private Equity Returns

Manager Selection and Vintage Year Matter

THOMSON/CAMBRIDGE PRIVATE EQUITY UNIVERSE
All Private Equity Database (All Regions)
IRRs by Vintage Year Through December 31, 2018

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Top 5%	40.5	37.6	34.0	21.4	28.1	32.3	36.2	37.5	40.0	37.2	37.5	40.0	44.8	48.7	74.0	34.5
Upper Qtl	17.8	14.2	12.8	13.1	14.7	16.4	21.3	18.8	20.2	19.3	19.7	24.3	22.6	21.7	23.8	-1.0
Median	9.7	7.5	7.4	7.5	8.8	9.5	13.1	12.2	13.4	13.7	13.0	14.5	13.4	10.5	7.6	-8.2
Lower Qtl	2.2	0.3	1.9	1.6	2.9	3.8	7.8	6.5	6.6	6.5	8.1	8.5	6.7	3.2	-2.5	-19.7
Bottom 5%	-13.8	-16.2	-9.0	-11.0	-12.5	-7.4	-0.9	-2.2	-5.1	-3.9	-0.6	-1.1	-6.5	-15.5	-32.5	-61.4
Pooled	**16.0**	**11.6**	**8.7**	**7.2**	**9.3**	**13.3**	**14.3**	**13.8**	**15.9**	**16.1**	**13.6**	**17.1**	**17.9**	**15.3**	**10.6**	**-5.3**
Size	108	151	242	278	292	251	119	146	193	204	192	216	248	199	153	179

Note: Returns are net of all partnership fees, expenses.
Source: Refinitiv/Cambridge

Significant dispersion within vintage years (10% to 30%).

- Above median returns are targeted.
- Successful individual managers have return persistence.

Large differences between adjacent vintage years.

- Cannot market-time, need to invest consistently.

J-curve effect is evident in newer vintage years.

- Return reduction is shorter and shallower with higher qualities.

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