Invesco

Alternative Opportunities

2022 Outlook and Methodology | USD

Invesco Investment Solutions

2022 Alternative Opportunities: Private markets outlook

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Head of Global Client Solutions and Alternatives
Invesco Investment Solutions

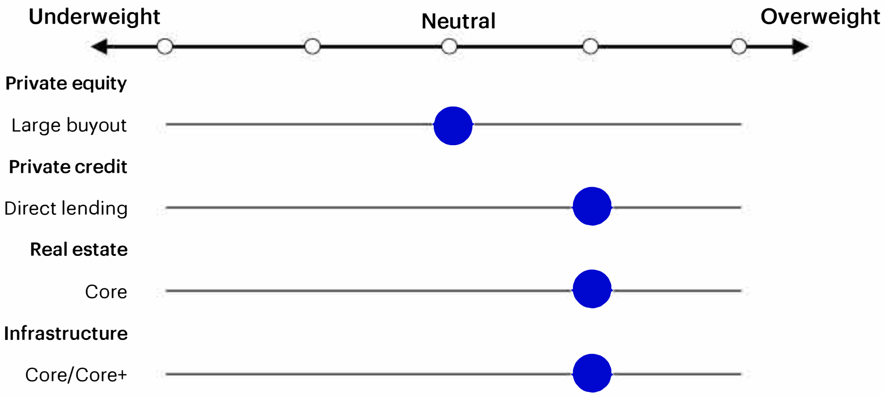
Introduction

In the 2022 edition of Alternative Opportunities, we are proud to introduce views on a variety of private asset classes from Invesco Investment Solutions and our partner firms. COVID-19 and its variants remain a challenge to both public health and policymakers with the spread of the Omicron variant. Despite these concerns, our team continues to design outcome-oriented portfolios for our clients throughout the uncertainty.

Over the following sections, we'll present a framework for analyzing across and within alternative markets, utilizing our expertise in this space and the vast dataset available to us. Hopefully, this transparency into our investment process will help inform your investment decisions as we continue to update this document on a semiannual basis.

In the chart on the right, we present our latest tactical views on private alternatives. Overall, we are optimistic despite higher valuations, the return of inflation, and tighter spreads, and we believe there are still opportunities in the riskier portions of the market.

Alternatives Tactical Asset Allocation Positioning



Source: Invesco Investment Solutions, current views as of Sept. 30, 2021. For illustrative purposes only. Past performance is not a guarantee of future results. There can be no assurance that any estimated returns or projections can be realized, that forward-looking statements will materialize or that actual returns or results will not be materially lower than those presented. An investment cannot be made into an index. Refer to Proxy information slide for additional information.

IIS Alternative Opportunities

Table of Contents

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Private credit

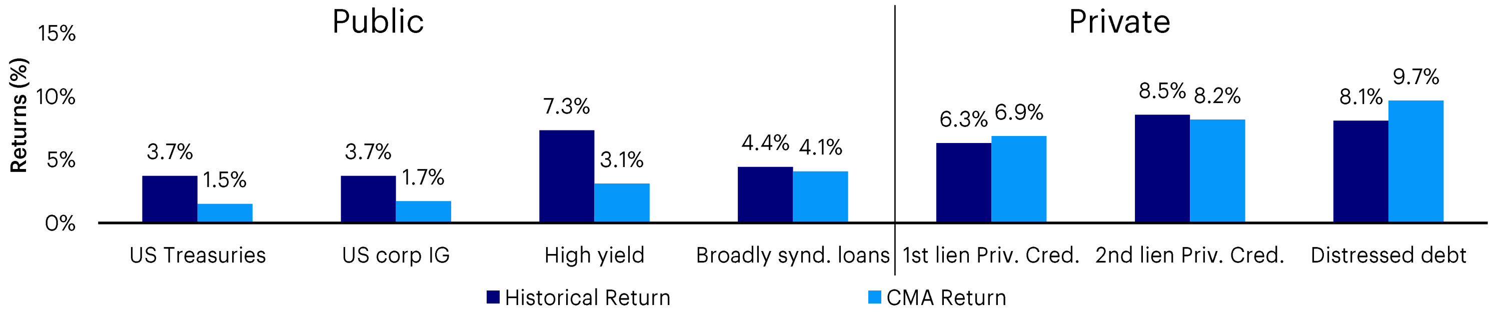
1

Private credit: Dashboard – attractive in our view

Private credit appears attractive across markets, 1st and 2nd lien private credit and distressed debt, when using our alternatives framework.

- Private credit CMAs are expected to be vastly higher than their public counterparts.
- Fundamentals and regime, are signaling “attractive,” while valuations are presently neutral.

Long-term historical return vs. CMA expected return



Asset Class	Overall	Valuations	Fundamentals	Regime
Private credit	**Attractive**	**Neutral**	**Attractive**	**Attractive**
1st lien private credit	Attractive	Neutral	Attractive	Attractive
2nd lien private credit	Attractive	Neutral	Attractive	Attractive

Very unattractive	Unattractive	Neutral	Attractive	Very attractive

Source: Invesco Investment Solutions, Bloomberg L.P., Burgiss, Preqin. For illustrative purposes only. All historical return data covers a 15Y period, other than 1st lien private credit, which is 10Y, the longest period available for the CDLI-S index. Past performance is not a guarantee of future results. There can be no assurance that any estimated returns or projections can be realized, that forward-looking statements will materialize or that actual returns or results will not be materially lower than those presented. Current return data as of Sept. 30, 2021. Data is unhedged USD. An investment cannot be made into an index. Refer to Proxy information slide for additional information. Capital market assumptions are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions.

Direct lending

1a

2022 Alternatives outlook: Direct lending

Jeff Bennett, CFA
Head of Manager Selection
Invesco Investment Solutions

Ron Kantowitz
Head of Direct Lending
Invesco Private Debt

Direct lending outlook

Direct lending proved to be resilient in 2021. Performance in the asset class returned to pre-pandemic levels on the heels of a strengthening economy. As the market found its footing, deal activity accelerated while yields held to historic levels.

As we look out to 2022, we remain favorable for the direct lending asset class. Although we anticipate greater volatility in the broader markets, several dynamics should work in the asset class's favor. On the demand side, private equity continues to amass record sums of capital which should support an active and robust M&A pipeline. Against a backdrop of likely Fed policy changes and continued inflationary pressure, the floating rate structure of the asset class offers protection in a rising rate environment. Lastly, as the broader equity and credit markets continue to encounter increased volatility, direct lending's low correlation to traditional assets creates needed diversification for income seeking investors.

In the near term, we can expect supply chain constraints and labor dynamics to continue to challenge business operating models, but we anticipate these dynamics abating in the second half of the year as global supply chains ramp up production.

With inflation and rates on the move, direct lending represents an asset class with stable risk adjusted returns, low correlation to more volatile liquid asset classes and protection against a rising rate environment.

Source: Invesco Investment Solutions, as of Sept. 30, 2021.

Direct lending: Alternative rating scorecard

To summarize our views on direct lending, we organized our key indicators into three buckets:

- **Valuations** are neutral, providing a premium to public markets and with CMAs largely in line with history.
- **Fundamentals** remain attractive with valuations of loans improving significantly.
- **Regime** positioning has remained in "low and stable," signaling high returns relative to public benchmarks.

Direct lending: Attractive		Current	Weight	Ranking	
Valuations					
Illiquidity premium	1st lien private credit vs. broadly syndicated loans	3.4%	0.25	4.0	Attractive
	2nd lien private credit vs. HY bonds	6.3%	0.25	3.0	Neutral
CMA	CMA vs. 1st lien private credit	0.6%	0.25	3.0	Neutral
	CMA vs. 2nd lien private credit	-0.3%	0.25	3.0	Neutral
Total valuations				**3.3** ↓	**Neutral**
Fundamentals/ supply and demand					
Debt metrics (US)	Debt/EBITDA	5.8x	0.2	3.0	Neutral
	Loan-to-Value (Debt/EV)	42.0%	0.2	5.0 ↑	Very Attractive
Debt metrics (Europe)	Debt/EBITDA	8.3x	0.2	3.0 ↓	Neutral
	Loan-to-Value (Debt/EV)	51.9%	0.2	3.0 ↓	Neutral
Supply and demand balance	Global direct lending/Global large buyout	23%	0.2	4.0	Attractive
Total fundamentals				**3.6**	**Attractive**
Macro/regime					
GRACI tactical sentiment	Regime expected return vs. historical average		0.50	3.0	Neutral
	Regime expected return vs. public market comparison		0.50	5.0	Very attractive
Total regime				**4.0**	**Attractive**

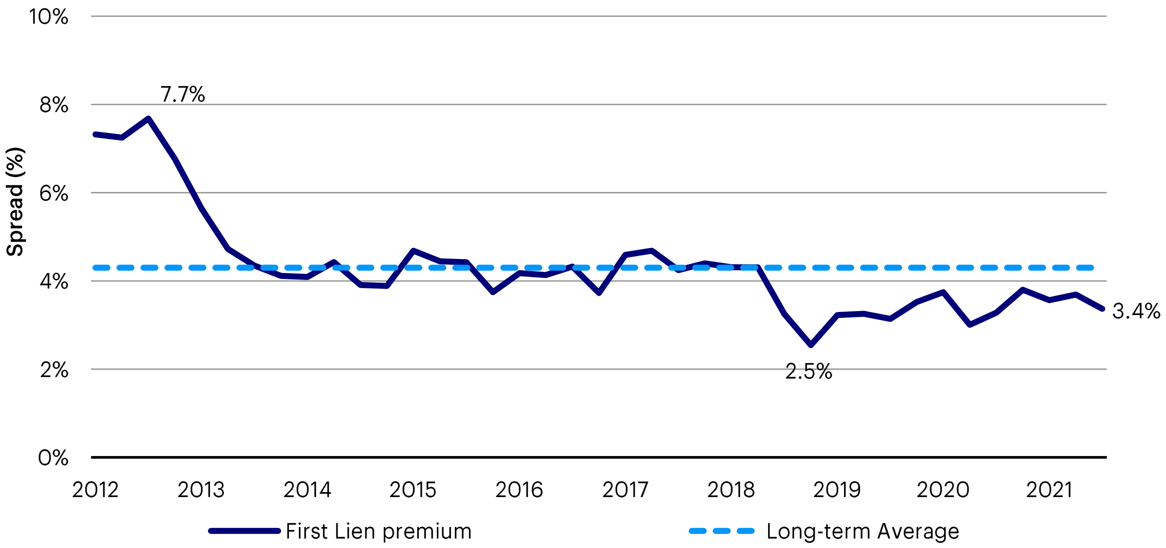
Source: Invesco Investment Solutions, as of Sept. 30, 2021. Rankings for the total valuations, total fundamentals and total regime metrics are generated by producing a weighted average from the "Weight" and "Ranking" columns.

1st lien private credit is attractive relative to public market comparisons

As a matter of choice, investors often compare broadly syndicated loans to 1st lien private credit. The excess spread over a public benchmark provides a critical valuations metric.

- 1st lien private credit has a spread of approximately 3.4%, close to historical averages.
- As the expected return of broadly syndicated loans has come off their recent peak in late 2018, 1st lien private credit's premium has begun to normalize.

Private credit spreads (1st lien private credit vs. broadly syndicated loans)



Relative attractiveness	
>4.5%	Very attractive
3-4.5%	Attractive
1.5-3%	Neutral
0-1.5%	Unattractive
<0%	Very unattractive

Table of contents

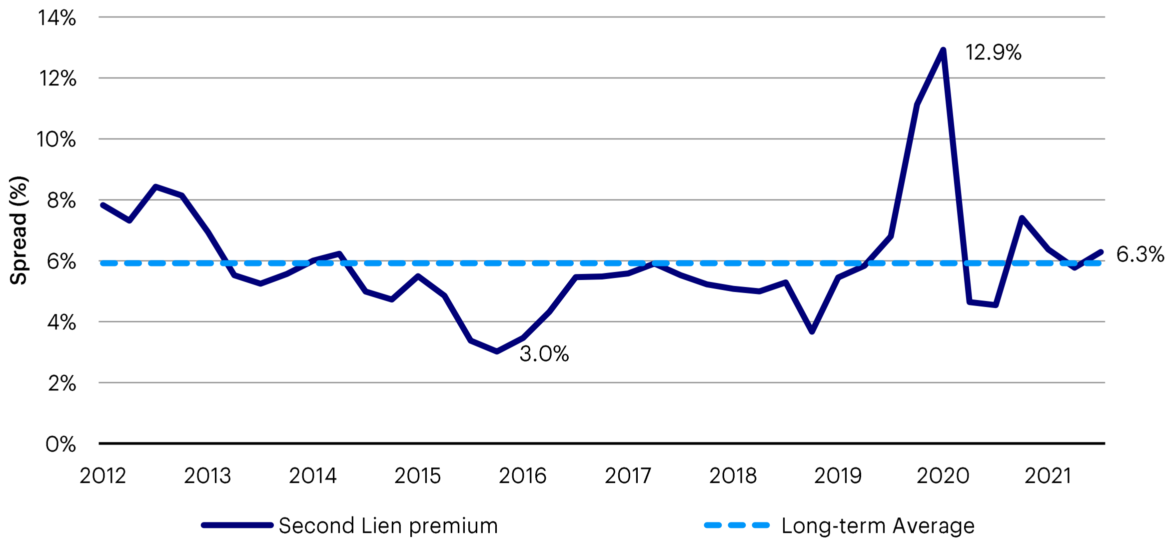
Source: Invesco Investment Solutions, Burgiss, as of Sept. 30, 2021. 1st lien private credit spread over LIBOR estimates are based on SEC filings by a representative sample of BDCs. Broadly syndicated loans yield is based on spread-to-maturity on the JPM Leveraged Loan Index.

2nd lien private credit spreads to public markets have narrowed significantly since Q1 2020 and are close to average

Often 2nd lien debt is compared to the spread over riskier, high yield bonds.

- Overall, the spread between the two is neutral at 6.3%.
- The premium is high and positive, near average levels.
- Public credit markets began to recover in the second half of 2020 after the COVID-19 crisis, lowering their yield.

Private credit spreads (2nd lien private credit vs. high yield bonds)



Relative attractiveness	
>8.5%	Very attractive
7-8.5%	Attractive
5.5-7%	Neutral
4-5.5%	Unattractive
<4%	Very unattractive

Table of contents
Private credit
Direct lending
Valuations
Illiquidity premium vs. public markets

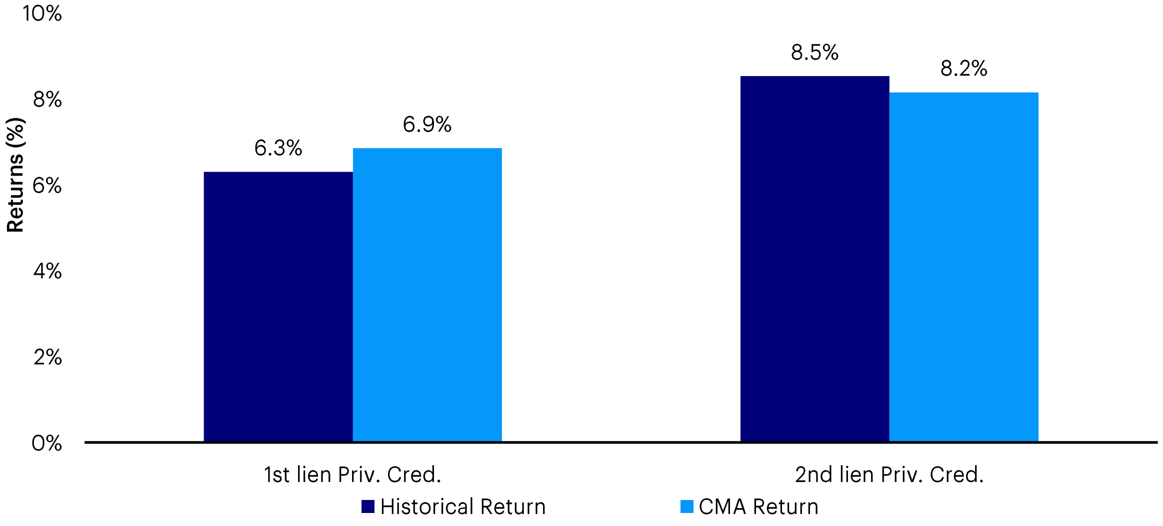
Source: Invesco Investment Solutions, as of Sept. 30, 2021. 2nd lien private credit spread over LIBOR estimates based on SEC filings by a representative sample of BDCs. HY bond yield is based on OAS on BBG Barc US Corp HY Index.

Direct lending expected returns are near long-term historical averages

Our capital market assumptions (CMAs) for 1st and 2nd lien private credit are used as valuation metrics in our framework when comparing them to their historical return averages.

- 1st lien's CMA (unlevered) is presently higher than history and represents a significant premium to public debt market.
- 2nd lien debt is expected to return slightly less on an annualized basis than the long-term historical average.

Annualized expected returns (CMA) relative to long-term historical averages



Relative attractiveness	
>2.0%	Very attractive
1-2%	Attractive
-1-1%	Neutral
-2- -1%	Unattractive
<-2%	Very unattractive

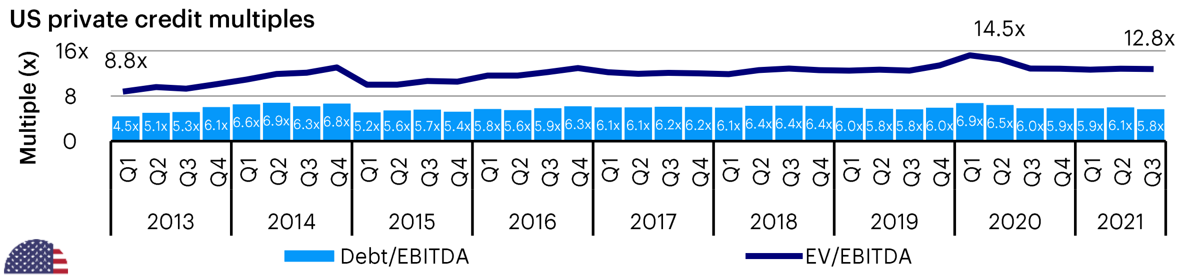
Table of contents

Source: Invesco Investment Solutions, Bloomberg L.P., Burgiss, Preqin. For illustrative purposes only. Past performance is not a guarantee of future results. There can be no assurance that any estimated returns or projections can be realized, that forward-looking statements will materialize or that actual returns or results will not be materially lower than those presented. Current return data as of Sept. 30, 2021. Data is unhedged USD. An investment cannot be made into an index. Refer to Proxy information slide for additional information. Capital market assumptions are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions.

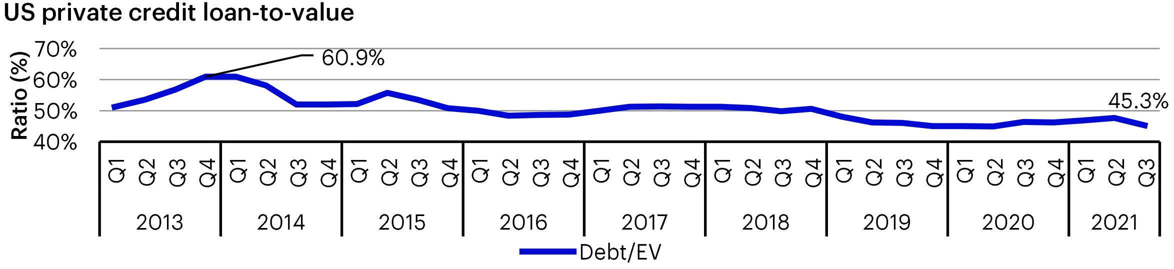
US private credit leverage remains relatively low

As companies seek financing for deals, valuation multiples are recorded and compared to history.

- US companies are financing deals at slightly higher than historical average valuation levels at around 6.0x Debt/EBITDA.
- A positive counterpoint surrounds very attractive levels of overall financing, where equity is a larger part of deals than debt and is approaching* record lows.



Relative attractiveness	
<5x	Very attractive
5-5.5x	Attractive
5.5-6x	Neutral
6-6.5x	Unattractive
>6.5x	Very unattractive



Relative attractiveness	
<45%	Very attractive
45-50%	Attractive
50-55%	Neutral
55-60%	Unattractive
>60%	Very unattractive

Table of contents

Source: Invesco Investment Solutions, Pitchbook 4Q21 US PE Breakdown, as of Sept. 30, 2021. Represents four-quarter rolling median numbers. Preliminary loan-to-value numbers for 4Q21 are 42% and are the lowest on record, promoting the category to very attractive levels.

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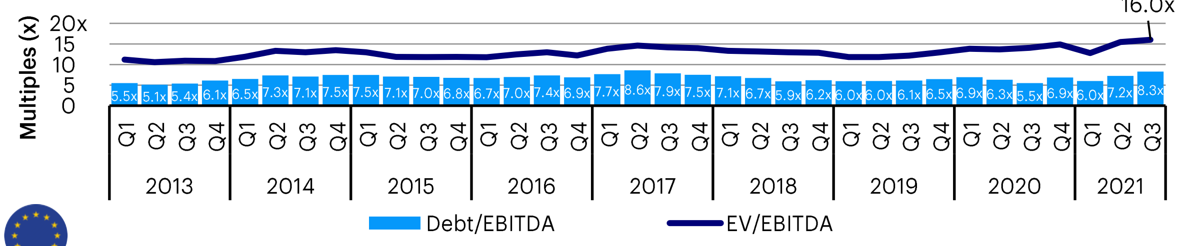
Fundamentals in European private credit are close to average

Fundamentals in Europe face similar headwinds to their US counterparts.

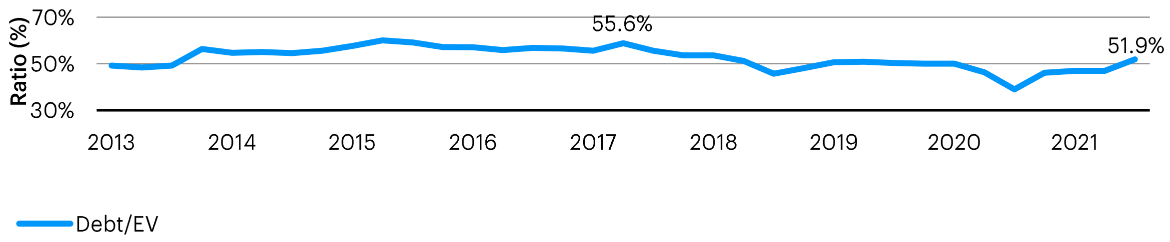
- Debt financing multiples in European deals are increasing in leverage, rising to pre-pandemic levels.
- Loan-to-value levels are starting to increase, signaling slightly less attractive deal valuations compared to the tough of 2020.

European private credit multiples



Relative attractiveness	
<5x	Very attractive
5-6.5x	Attractive
6.5-8.5x	Neutral
8.5-10x	Unattractive
>10x	Very unattractive

European private credit loan-to-value



Relative attractiveness	
<45%	Very attractive
45-50%	Attractive
50-55%	Neutral
55-60%	Unattractive
>60%	Very unattractive

Table of contents

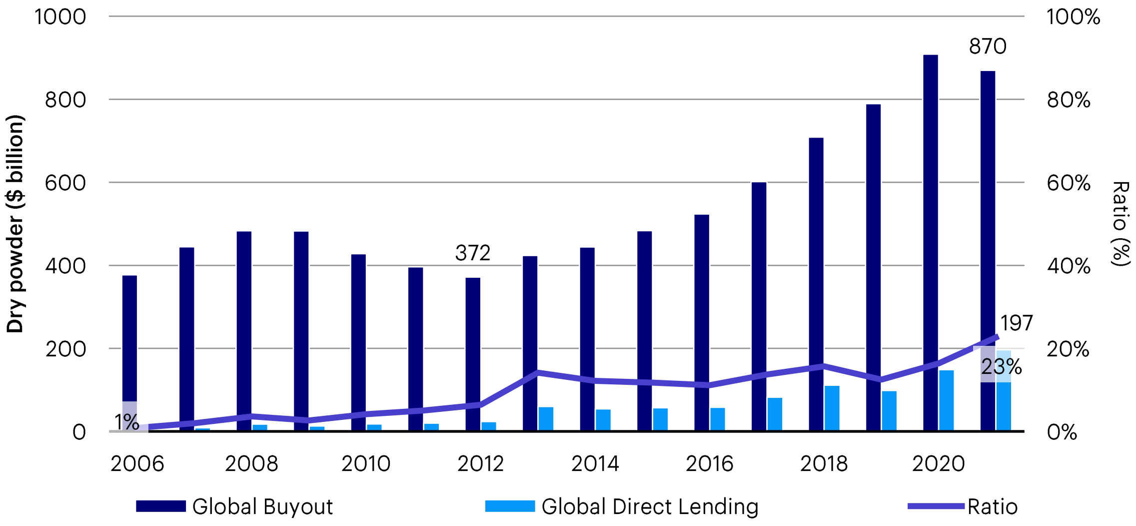
Source: Invesco Investment Solutions, Pitchbook 4Q21 European PE Breakdown, as of Sept. 30, 2021. Represents four-quarter rolling median numbers.

Global supply and demand for direct lending remains balanced

Dry powder reflects the selectivity of managers within the private space. Further, funds have the option to deploy that capital when opportunities appear.

- Overall, cash levels are elevated for both large buyouts and direct lending.
- However, the ratio of debt and equity dry powder is around its post-2013 average and rising.

Dry powder in global large buyout and direct lending



Relative attractiveness	
>15%	Very attractive
15-25%	Attractive
25-35%	Neutral
35-45%	Unattractive
>45%	Very unattractive

Table of contents

Source: Invesco Investment Solutions, Preqin, as of Sept. 30, 2021.

Private equity

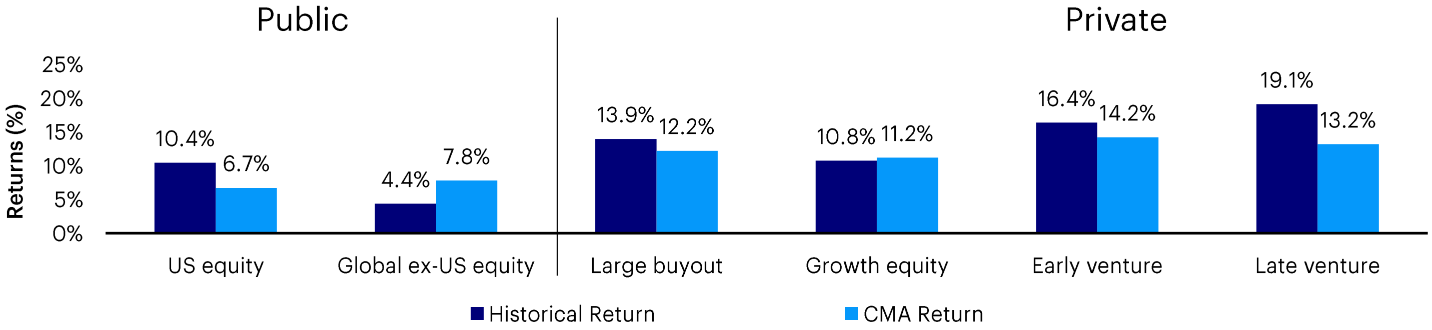
2

Private equity: Dashboard – neutral in our view

Private equity (PE) remains an asset to consider as a growth investor.

- Our neutral conviction of PE is justified as these assets still command a significant return premium to their public market counterparts despite facing headwinds from valuations.
- Investors seeking larger equity returns could potentially fund PE from challenged public equity, notably within the US.

Long-term historical return vs. CMA expected return



Asset Class	Overall	Valuations	Fundamentals	Regime
Private Equity	**Neutral**	**Neutral**	**Neutral**	**Attractive**
Large buyout	Neutral	Neutral	Neutral	Attractive

Very unattractive	**Unattractive**	**Neutral**	**Attractive**	**Very attractive**

Source: Invesco Investment Solutions, Bloomberg L.P., Burgiss, Preqin. For illustrative purposes only. Historical return data is 15Y for all assets. Past performance is not a guarantee of future results. There can be no assurance that any estimated returns or projections can be realized, that forward-looking statements will materialize or that actual returns or results will not be materially lower than those presented. Current return data as of Sept. 30, 2021. Data is unhedged USD. An investment cannot be made into an index. Refer to Proxy information slide for additional information. Capital market assumptions are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions.

Large buyout

2a

2022 Alternatives outlook: Large buyout

Jeff Bennett, CFA
Head of Manager Selection
Invesco Investment Solutions

Private equity outlook

Looking out into the horizon using our capital market assumptions (CMAs), there are few places for equity investors to go when seeking historical levels of growth. Private equity has provided outsized levels of return than public markets on average and double-digit annualized returns have been common historically. We are monitoring rising debt levels of target firm balance sheets within the leveraged buyout (LBO) market which could be a headwind to prospective returns.

Private equity strategies start 2022 with strong momentum in terms of returns and deal activity. Our CMA is slightly below LBO's historical return profile, yet significantly about that of public equity. With over $650B of global M&A volume, and roughly $500B coming from the US, we anticipate the accelerating trend of deal flow to continue for some time. Despite growing activity from LBO's, today's levels are nowhere near those of the 2000's tech bubble and are presently being monitored. Dry powder levels are improving relative to the size of the SMID opportunity set, providing ample space for deals throughout the rest of the year.

While there are risks around the post-pandemic recovery, high valuations, and tax and regulatory environment, we remain bullish on the prospects for private equity in 2022. Deal activity should stay high as private equity firms look to put their record levels of dry powder to work. Firms able to leverage their record war chests to take advantage of new opportunities and manage existing positions through the pandemic induced turmoil should be positioned to excel. Finally, existing portfolio exits should benefit from the explosive growth of the SPAC market and a strong IPO market.

Source: Invesco Investment Solutions, as of Sept. 30, 2021.

Large buyout: Alternative rating scorecard

The outlook for large buyouts, one of the biggest PE segments, ranges from neutral to attractive:

- **Valuations** are neutral as yields are stable relative to public markets. While CMAs are slightly below their historical average, elevated firm debt levels have begun to lower their attractiveness.
- **Fundamentals** are neutral as buyouts as a proportion of M&A activity is picking up. Dry powder is improving, due to a larger opportunity set.
- **Regime** positioning has remained in “low and stable,” signaling high returns relative to public benchmarks.

Large buyout: Neutral		Current	Weight	Ranking	
Valuations					
Relative yields	US large buyout relative to public equity market yield	4.4%	0.50	4.0	Attractive
CMA	CMA vs. long-term historical return	-1.7%	0.50	2.0 ↓	Unattractive
Total valuations				**3.0** ↓	**Neutral**
Fundamentals / supply and demand					
Deal volume vs. total M&A activity	US deal vol. vs. US M&A activity	16.0%	0.25	2.0	Unattractive
	Global deal vol. vs. global M&A activity	12.6%	0.25	2.0 ↑	Neutral
Supply and demand	Large buyout dry powder vs. SMID equity market cap	15.1%	0.50	3.0	Neutral
Total fundamentals				**2.5**	**Neutral**
Macro/Regime					
GRACI tactical sentiment	Regime expected return vs. historical average		0.5	3.0	Neutral
	Regime expected return vs. public market comparison		0.5	5.0	Very Attractive
Total regime				**4.0**	**Attractive**

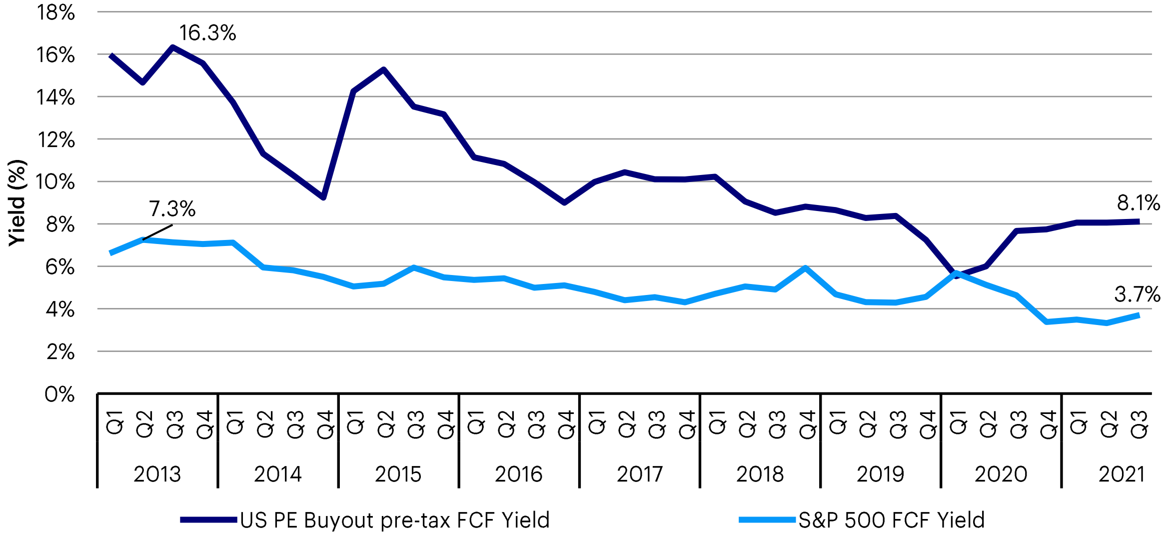
Source: Invesco Investment Solutions, as of Sept. 30, 2021. Rankings for the total valuations, total fundamentals and total regime metrics are generated by producing a weighted average from the “Weight” and “Ranking” columns.

US large buyout is still expected to provide excess yield relative to public markets, but less than historically observed

Free cash flow (FCF) yield is a valuation metric that represents the amount of cash a company generates relative to price.

- This measure of yield has been declining for both public and private equities over the past cycle, indicating a smaller value opportunity.
- PE yield spreads look attractive and represent a premium for investors willing to lock up capital.

US large buyout vs. equity market yield



Relative attractiveness	
>6%	Very attractive
4-6%	Attractive
2-4%	Neutral
0-2%	Unattractive
<0%	Very unattractive

Table of contents

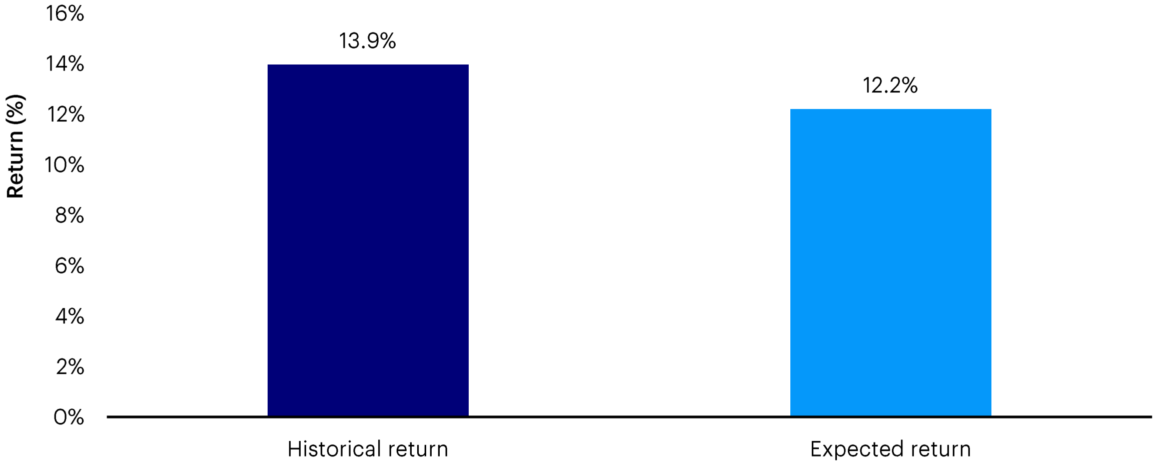
Source: Invesco Investment Solutions, Pitchbook, Bloomberg L.P., S&P LCD, as of Sept. 30, 2021.

Our CMA for US large buyout is slightly below the historical average

Large buyout CMAs are composed of similar building blocks to public equities, with a few additional levers; yield, growth, valuations, leverage, and improvements.

- We are anticipating slightly lower PE returns relative to long-term historical averages.
- Of note, PE has been providing over double-digit IRRs for the past two decades, almost triple that of public equities over that time.

Annualized expected returns (CMA) relative to historical averages



Relative attractiveness	
>2.0%	Very attractive
1-2%	Attractive
-1-1%	Neutral
-2- -1%	Unattractive
<-2%	Very unattractive

Table of contents

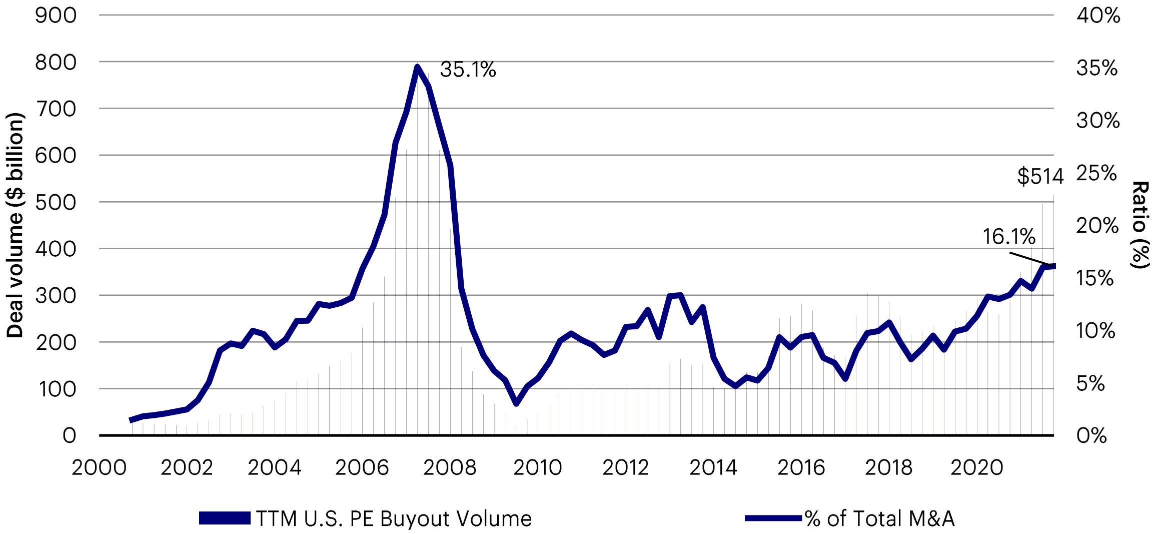
Source: Invesco Investment Solutions, Bloomberg L.P., Burgiss, Preqin. Historical return data is 15Y for all assets. For illustrative purposes only. Past performance is not a guarantee of future results. There can be no assurance that any estimated returns or projections can be realized, that forward-looking statements will materialize or that actual returns or results will not be materially lower than those presented. Current return data as of Sept. 30, 2021. Data is unhedged USD. An investment cannot be made into an index. Refer to Proxy information slide for additional information. Capital market assumptions are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions.

US large buyout deal volume is has been slowly trending higher relative to the broader M&A market

A contrarian fundamental indicator in the PE space is the pace of deal activity, and specifically the percentage of a certain category of deal activity, like buyouts.

- M&A activity is still depressed in the US compared to the period leading up to the GFC, easing concerns of an overheating market.
- As a percentage of total M&A, large buyouts are above this cycle's average, implying an unattractive rating from our methodology.

US large buyout vs. total US M&A activity



Relative attractiveness	
<5%	Very attractive
5-10%	Attractive
10-15%	Neutral
15-20%	Unattractive
>20%	Very unattractive

Table of contents

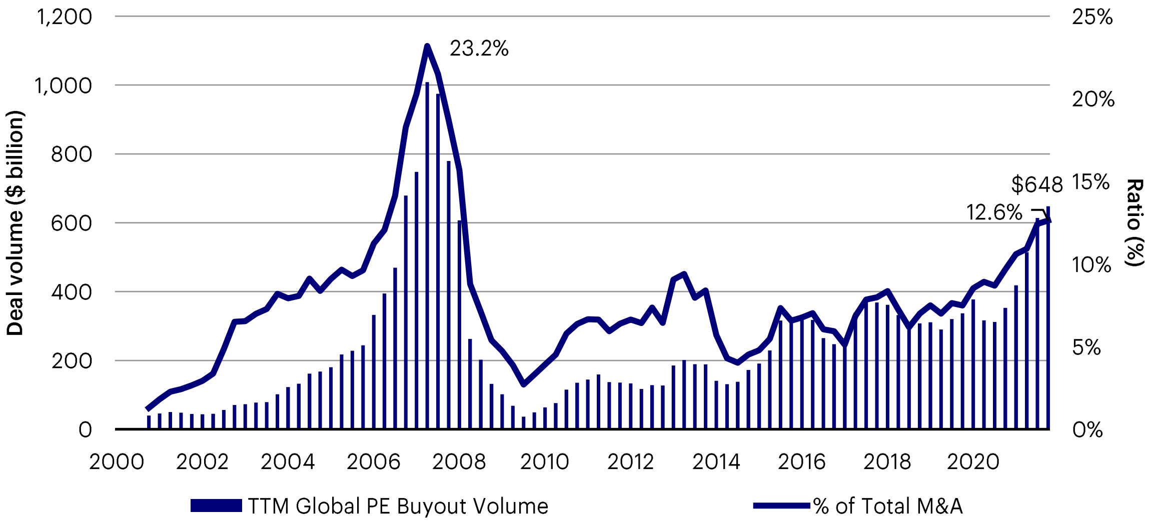
Source: Invesco Investment Solutions, Pitchbook, Bloomberg L.P., S&P LCD, as of Sept. 30, 2021.

Global large buyout volumes are also trending higher, largely due to increased activity in Asia

Of the roughly $650 billion in global M&A deals over 2021, 12.6% were buyouts.

- The trends in place in the US are prevalent globally as the US is a large part of overall deal flow.
- Activity is above the post-GFC average, while the share of buyouts is increasing steadily. However, buyout's global share is slightly lower, signaling an neutral rating.

Global large buyout vs. total M&A activity



Relative attractiveness	
<5%	Very attractive
5-10%	Attractive
10-15%	Neutral
15-20%	Unattractive
>20%	Very unattractive

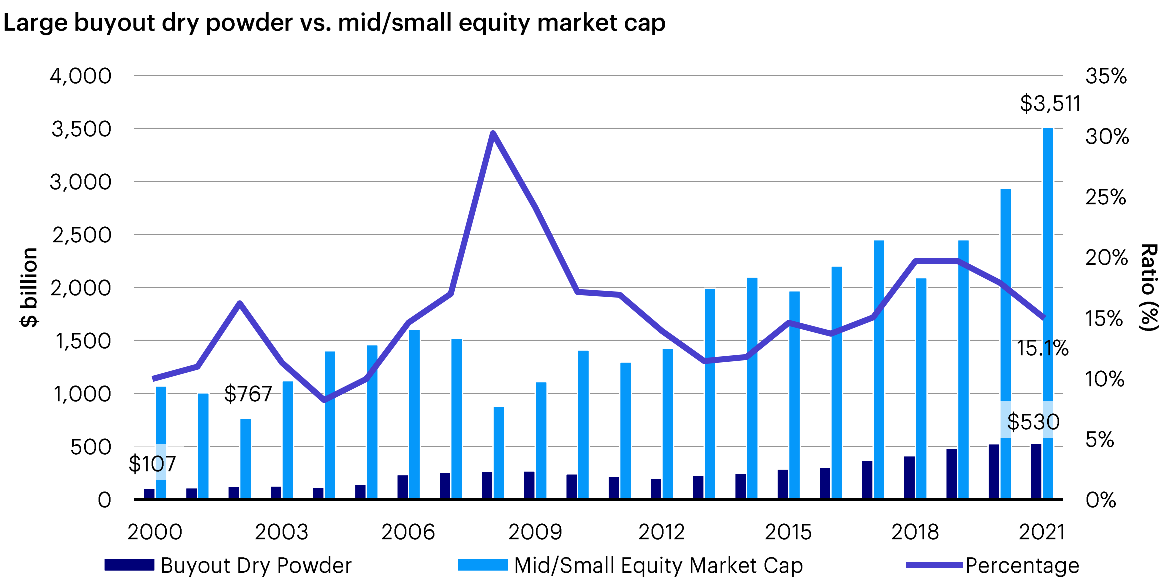
Table of contents

Source: Invesco Investment Solutions, Pitchbook, Bloomberg L.P., S&P LCD, as of Sept. 30, 2021.

US large buyout supply and demand dynamics remain stable

Companies are typically bought out when they are in the small to medium (SMID) size range, allowing PE managers to significantly influence them and change the path of growth.

- Market cap of the opportunity set for buyouts, SMID equities, is higher than average.
- The upward trend in cap is matched by larger amounts of dry powder available to be used when sound investments present themselves.



Relative attractiveness	
<10%	Very attractive
10-15%	Attractive
15-20%	Neutral
20-25%	Unattractive
>25%	Very unattractive

Table of contents

Source: Invesco Investment Solutions, Bloomberg L.P., Preqin, as of Sept. 30, 2021. Mid/Small Equity Market represented by Russell 2000 Index.

Real assets

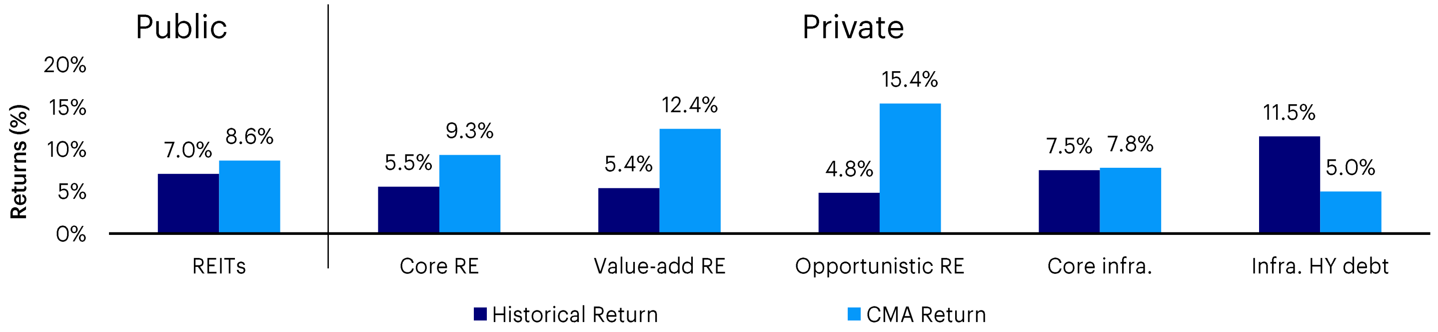
3

Real assets: Dashboard – attractive in our view

Real assets and their sub-assets, real estate and infrastructure, are both attractive using our framework.

- CMAs for core real estate offer a slight premium to REITs and is significantly above their own history.
- As one moves further out into the risk spectrum, within value add or opportunistic, the forward return profile beings to highlight an increasingly attractive spread to history.

Long-term historical return vs. CMA expected return



Asset Class	Overall	Valuations	Fundamentals	Regime
Real assets	Attractive	Attractive	Attractive	Very attractive
Real estate core	Attractive	Attractive	Attractive	Very attractive
Infrastructure core	Attractive	Attractive	Attractive	Very attractive

Very unattractive	Unattractive	Neutral	Attractive	Very attractive

Source: Invesco Investment Solutions, Bloomberg L.P., Burgiss, Preqin. Historical return data is 15Y for all assets. For illustrative purposes only. Past performance is not a guarantee of future results. There can be no assurance that any estimated returns or projections can be realized, that forward-looking statements will materialize or that actual returns or results will not be materially lower than those presented. Current return data as of Sept. 30, 2021. Data is unhedged USD. An investment cannot be made into an index. Refer to Proxy information slide for additional information. Capital market assumptions are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions.

Real assets: Real estate and infrastructure

3a

2022 Alternatives outlook: Real assets

Jeff Bennett, CFA
Head of Manager Selection
Invesco Investment Solutions

Mike Bessel
Investment Strategist
Invesco Global Real Estate

Real assets outlook

Real assets are enjoying strong occupational and investment demand coming into 2022, both as economic activity rebounds and as a result of offering an inflationary hedge. Secular trends remain the bedrock of demand drivers and serve as the basis for our sector and asset selection.

Strong investment demand for income-generating real estate is expected to continue to support prime cap rates. Given that cap rate spreads to government bond yields are within, and in some cases above, normal ranges, real estate demand is likely to remain strong even if base rates start to rise. Positive momentum in economic activity continues to drive multiple supportive trends for global real estate markets.

Infrastructure markets showed further momentum through 2021, continuing to prove comparatively resilient amid the pandemic related headwinds. While the overall sector fared well, there was a considerable level of divergence within infrastructure. Telecom infrastructure was amongst the least affected by the pandemic, as it was supported by robust increases in data traffic. Utilities and sectors with regulated or contracted cash flows were also less exposed than other industries. Passenger transportation including unregulated toll roads and airports faced a headwind due to remote work, lockdowns, and travel restrictions.

Certain real asset sectors saw demand unaffected, or even positively accelerated, as a result of the COVID-19 pandemic, with valuations reflecting this momentum. Other sectors, particularly around global travel and transport, have seen a valuation shock, but demand is expected to recover as economies reopen and border restrictions ease, leading to selective investment opportunities at discounts to historic valuations.

Source: Invesco Investment Solutions, as of Sept. 30, 2021.

Real assets: Alternative rating scorecard

All real assets' components within our framework are presently attractive or higher:

- **Valuations** are attractive as spreads are wide to bonds, nominal and real, and CMAs are providing a premium to history.
- **Fundamentals** are sounder in real estate than infrastructure. Elevated valuations are less of a worry when there is healthy debt coverage and high levels of dry powder.
- **Regime** positioning has remained in "low and stable," signaling very high returns relative to history and public benchmarks.

Real assets: Attractive		Current	Weight	Ranking	
Valuations					
Spread to liquid markets	vs. 10Y treasuries	2.7%	0.13	3.0 ↓	Neutral
	vs. Baa corporate bonds	0.74%	0.13	4.0	Attractive
	vs. Inflation-indexed government bonds	4.9%	0.25	4.0	Attractive
CMA	Core RE CMA vs. historical returns	3.8%	0.25	5.0 ↑	Very Attractive
	Infrastructure CMA vs. historical returns	0.3%	0.25	3.0	Neutral
Total valuations				**3.8**	**Attractive**
Fundamentals/ supply and demand					
Infrastructure	Global EV/EBITDA	6.8x	0.30	4.0	Attractive
	Dry powder vs. deal volume	168%	0.30	3.0	Neutral
Real estate	Loan-to-Value (rolling 4-quarters)	58.9%	0.30	4.0	Attractive
	Debt coverage ratio	2.4x	0.30	5.0	Very attractive
	Dry powder vs. deal volume	95%	0.30	3.0	Neutral
Total fundamentals				**3.8**	**Attractive**
Macro/regime					
GRACI tactical sentiment	Regime expected return vs. historical average		0.50	5.0 ↑	Very attractive
	Regime expected return vs. public markets		0.50	5.0	Very attractive
Total regime				**5.0**	**Very attractive**

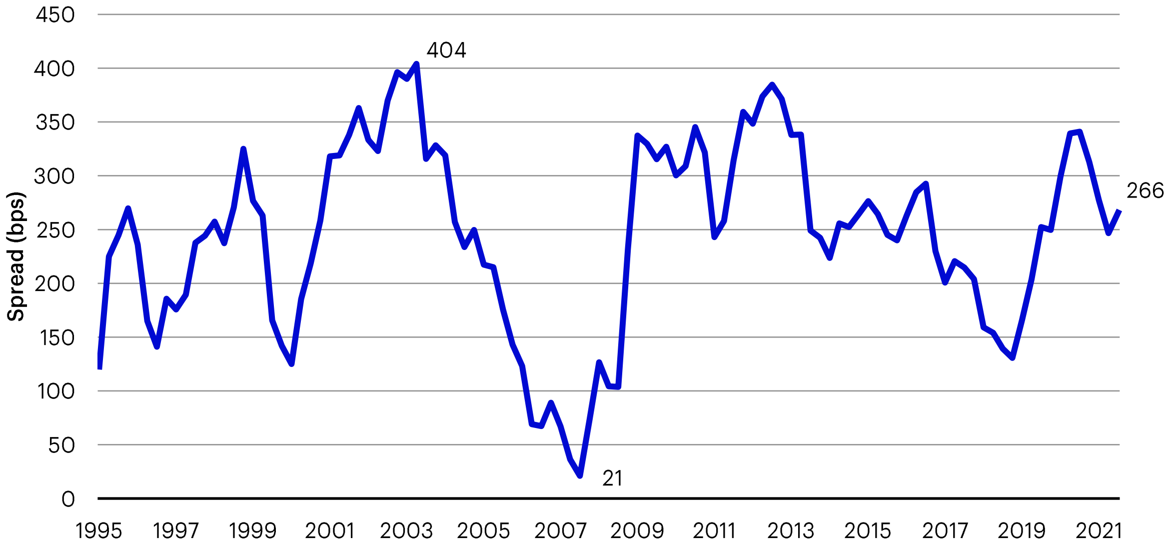
Source: Invesco Investment Solutions, as of Sept. 30, 2021. Rankings for the total valuations, total fundamentals and total regime metrics are generated by producing a weighted average from the "Weight" and "Ranking" columns.

Real estate cap rate spreads over US Treasury yields have slightly weakened to a neutral rating

The spread an investor earns from real estate yields, otherwise known as cap rates, over treasuries is a way to determine the valuations of these assets.

- Cap spreads are presently close to their average, in a range suggesting similar expected returns and valuations compared to history.
- As this spread decreases, like in 2007, it's a signal that there may be potential weakness ahead.

Yield/cap rate spread to 10Y US Treasury yields



Relative attractiveness	
>350	Very attractive
275-350	Attractive
200-275	Neutral
125-200	Unattractive
<125	Very unattractive

Table of contents
Real assets
Real estate and infrastructure
Valuations
Yield/cap rate spread to 10Y treasury yields

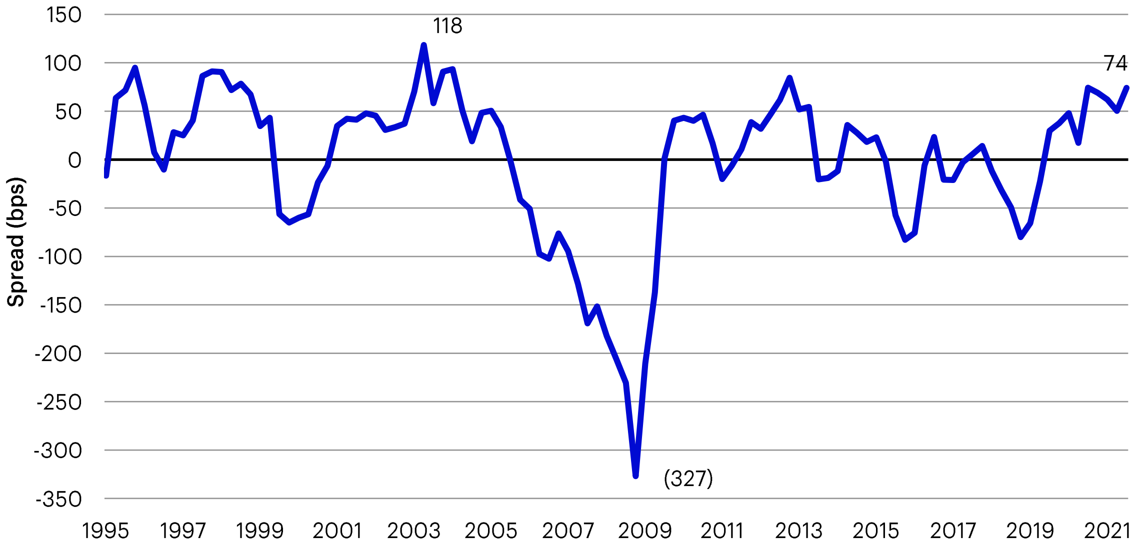
Source: Invesco Investment Solutions, NCREIF, US Board of Governors of the Federal Reserve System, as of Sept. 30, 2021.

Real estate cap rate spreads over corporate bonds also remain attractive

Riskier credits provide pertinent information about real estate's relative valuations and tend to oscillate around zero outside of severe recessions.

- As recent weakness appeared in the real estate market, Baa spreads widened significantly, signaling the start of a new cycle not seen since 2012.

Yield/cap rate spreads to Baa corporate bonds



Relative attractiveness	
>75	Very attractive
25-75	Attractive
-25-25	Neutral
-75- -25	Unattractive
<-75	Very unattractive

Table of contents

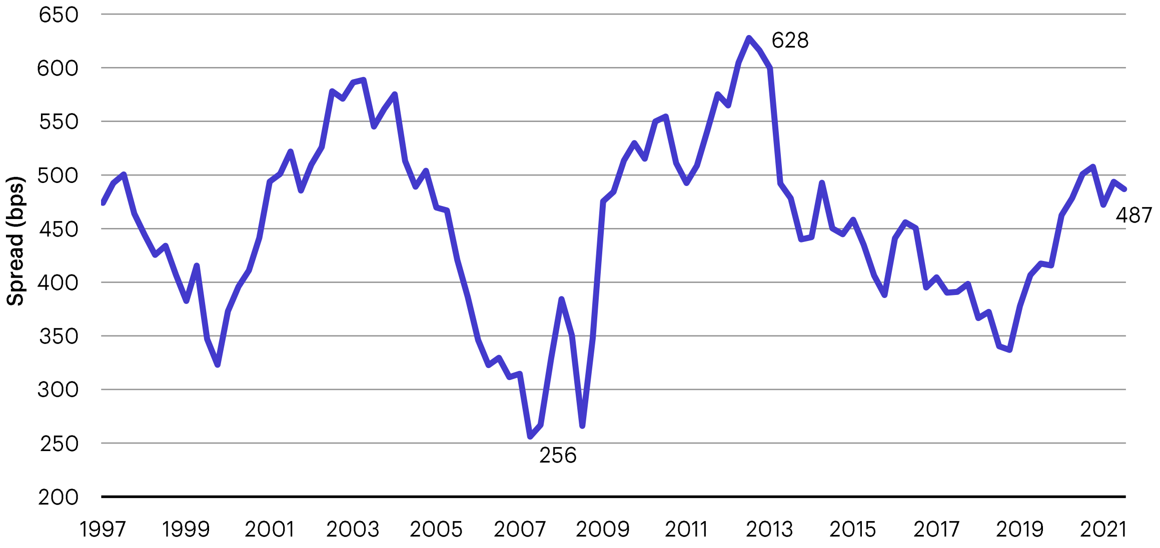
Source: Invesco Investment Solutions, NCREIF, Moody's Analytics, as of Sept. 30, 2021.

Real estate cap rate spreads over inflation-linked government bonds also remain attractive

Another lens to examine RE's spreads are in comparison to inflation-linked bonds.

- Often real estate is touted as an inflation hedge, so the spread provides information on how large the asset's inflation risk-premium is.
- Presently, the spread is slightly above average and falling, providing potential spread compression for investors seeking an alternative to TIPS.

Yield/cap rate spreads to inflation-linked government bonds



Relative attractiveness	
>550	Very attractive
450-550	Attractive
350-450	Neutral
-250-350	Unattractive
<250	Very unattractive

Table of contents

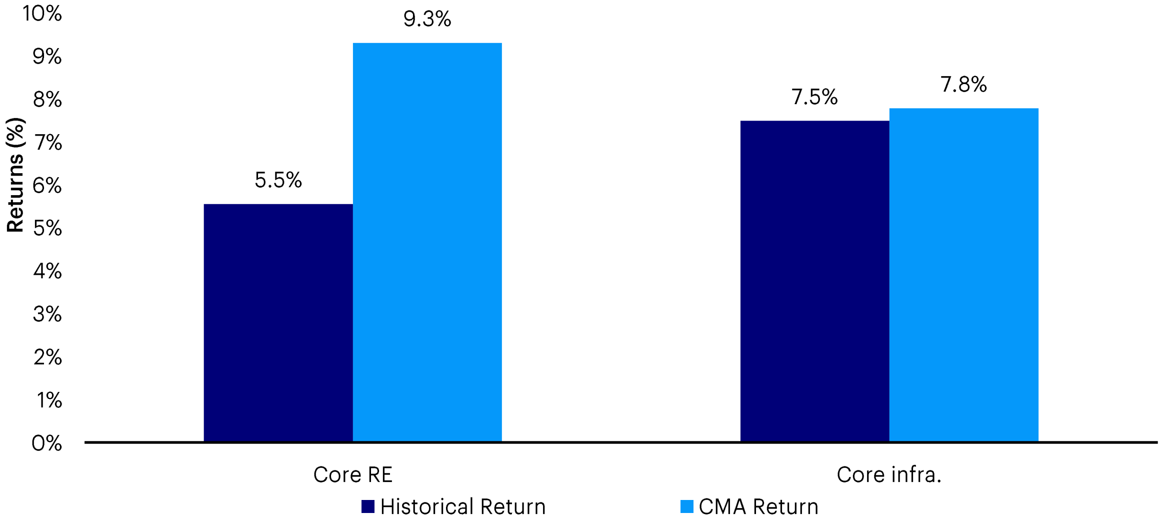
Source: Invesco Investment Solutions, NCREIF, Moody's Analytics, as of Sept. 30, 2021.

Core real asset expected returns are above historical averages

Real estate and infrastructure's CMAs are both built off similar components, yield, growth, improvements, and leverage.

- When compared to history, real estate's return prospects look more attractive than infrastructure, with both projected to be above average.
- Both offer attractive returns relative to traditional assets like stocks and bonds and could help mitigate inflation risks.

Annualized expected returns (CMA) relative to long-term historical averages



Relative attractiveness	
>2.0%	Very attractive
1-2%	Attractive
-1-1%	Neutral
-2- -1%+	Unattractive
<-2%	Very unattractive

Table of contents

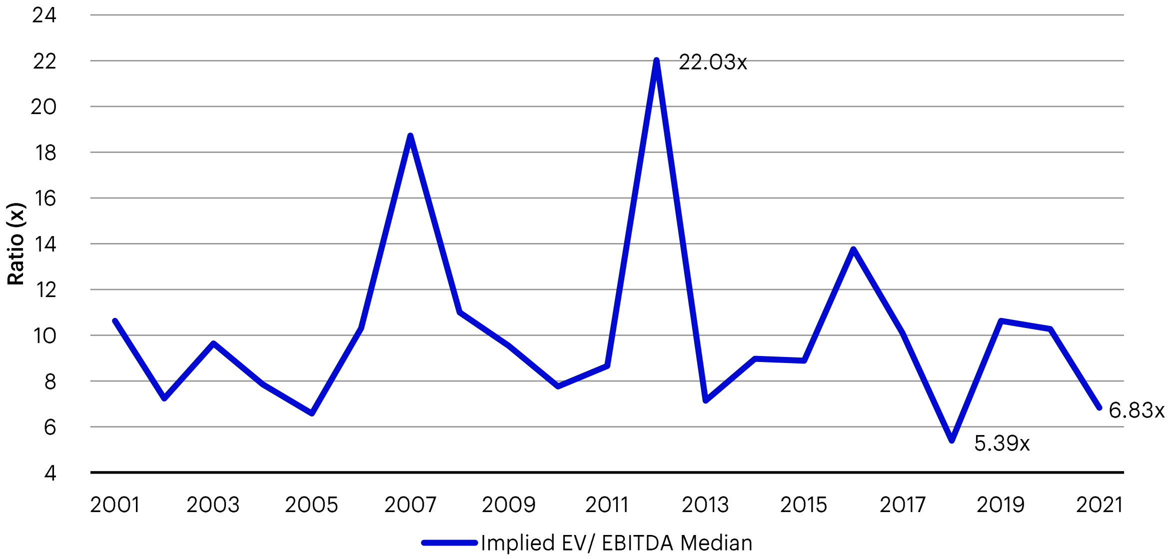
Source: Invesco Investment Solutions, Bloomberg L.P., Burgiss, Preqin. Historical return data is 15Y for all assets. For illustrative purposes only. Past performance is not a guarantee of future results. There can be no assurance that any estimated returns or projections can be realized, that forward-looking statements will materialize or that actual returns or results will not be materially lower than those presented. Current return data as of Sept. 30, 2021. Data is unhedged USD. An investment cannot be made into an index. Refer to Proxy information slide for additional information. Capital market assumptions are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions.

Infrastructure deal pricing remains stable

Deal pricing using the enterprise value to EBITDA multiple is a way of measuring a key fundamental of real assets. What managers end up paying for deals affects returns in the future.

- Present deal pricing is slightly above the long-term average resulting in an attractive rating.

Infrastructure deals implied EV/EBITDA median



Relative attractiveness	
<6x	Very attractive
6-8x	Attractive
8-12	Neutral
12-14x	Unattractive
>14x	Very unattractive

Table of contents

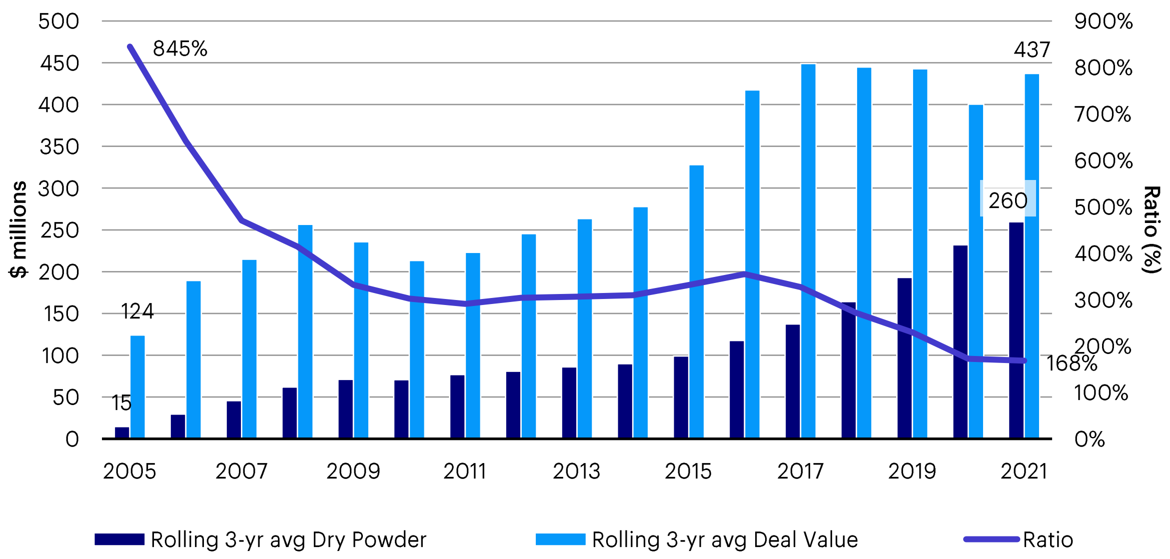
Source: Invesco Investment Solutions, Pitchbook, as of Sept. 30, 2021. Comprises utilities, transportation and communications and networking sectors.

Increasing demand for infrastructure assets with stable deal values

The supply of infrastructure deals represents the overall health of the market and ability for managers to access investments.

- Deal values are near record highs as the demand for these assets has been filled by the private market.
- Dry powder has also been increasing but at a slightly slower rate, earning a neutral rating.

Infrastructure rolling 3-yr average deal value vs. dry powder



Relative attractiveness	
>200%	Very attractive
175-200%	Attractive
125-175%	Neutral
100-125%	Unattractive
<100%	Very unattractive

Table of contents

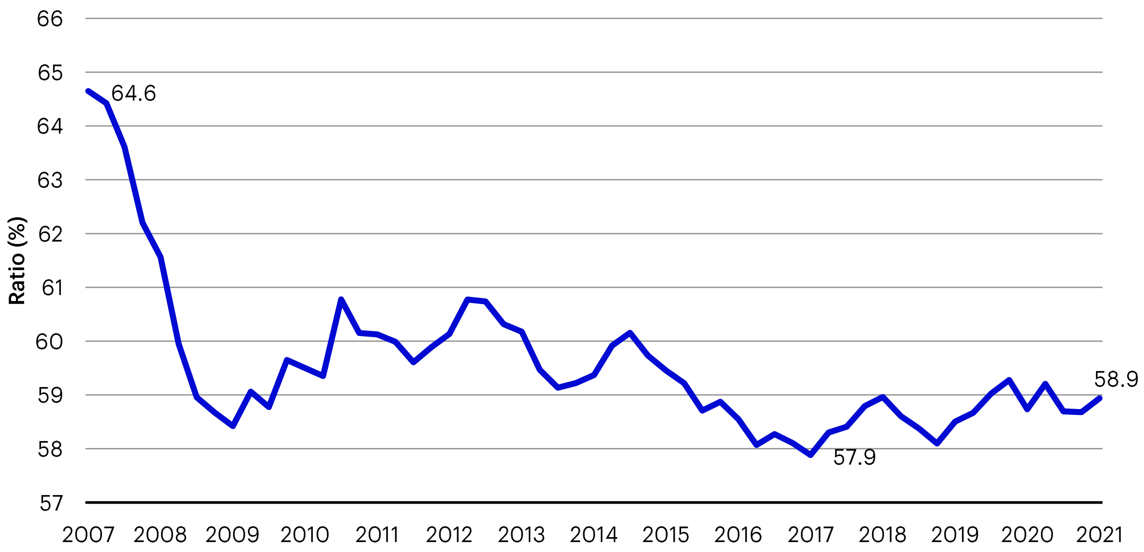
Source: Invesco Investment Solutions, Preqin, as of Sept. 30, 2021.

Loan-to-value ratio within real estate remains near historical averages

Loan-to-value (LTV) is a means of determining how much leverage investors are using when deploying capital.

- The current LTV ratio is around the post-GFC average, implying deals are being fairly valued and capitalized and is attractive in our view.

Real estate: Loan-to-value ratio (rolling 4-quarter average)



Relative attractiveness	
<58%	Very attractive
58-59%	Attractive
59-61%	Neutral
61-62%	Unattractive
>62%	Very unattractive

Table of contents

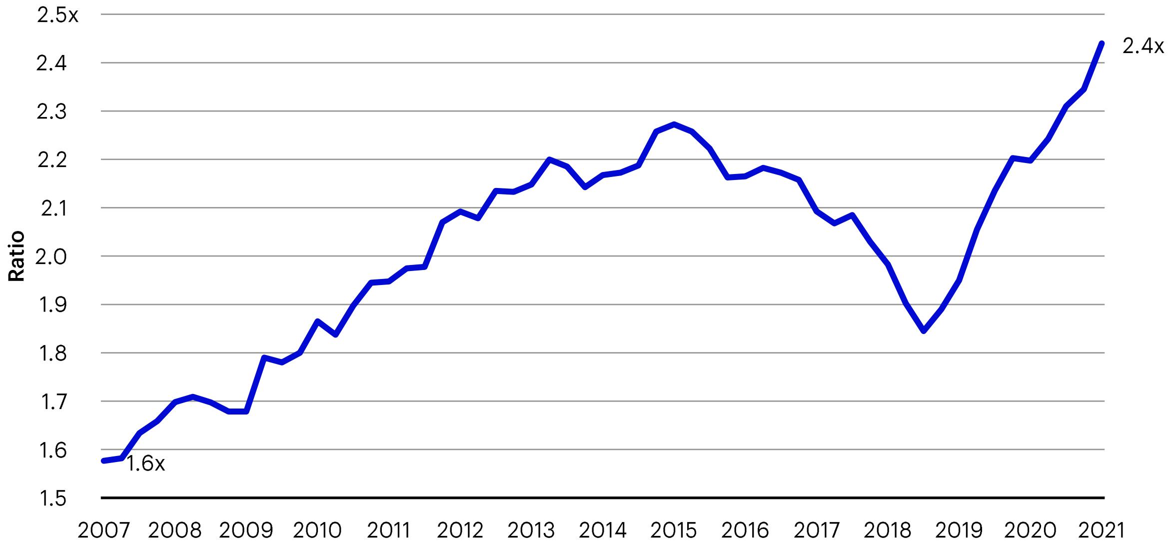
Source: Invesco Investment Solutions, American Council of Life Insurers, as of Sept. 30, 2021.

Strong debt coverage ratios across the real estate sector indicate healthy balance sheets

Debt coverage indicates the stress within an asset class represented by the cost of paying interest from operating income.

- Real estate balance sheets have only gotten healthier post-GFC and the pandemic, and presently the ratio is at its highest levels, resulting in a very attractive score.

Real estate: Debt coverage ratio (rolling 4-quarter average)



Relative attractiveness	
>2.15x	Very attractive
2.05-2.15x	Attractive
1.85-2.05x	Neutral
1.7-1.85x	Unattractive
>1.7	Very unattractive

Table of contents

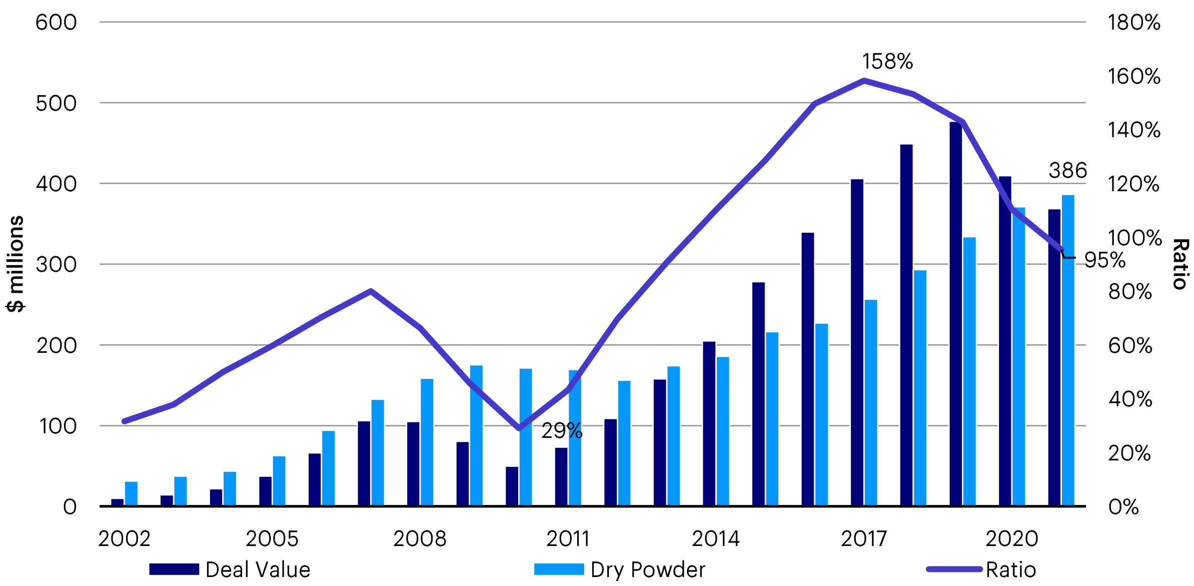
Source: Invesco Investment Solutions, American Council of Life Insurers, as of Sept. 30, 2021.

Demand has been outpacing rising supply of real estate assets in recent years

Supply and demand for real estate are presently neutral.

- Deal values continued to fall from their highs of 2019.
- The supply of dry powder remains above average and rising.
- This ratio of the two indicators is trending downwards and may signal there are too few attractive deals on the market.

Real estate rolling 3-yr average deal value vs. dry powder



Relative attractiveness	
>125%	Very attractive
100-125%	Attractive
75-100%	Neutral
50-75%	Unattractive
<50%	Very unattractive

Table of contents

Source: Invesco Investment Solutions, Preqin, as of Sept. 30, 2021.

Regimes analysis

4

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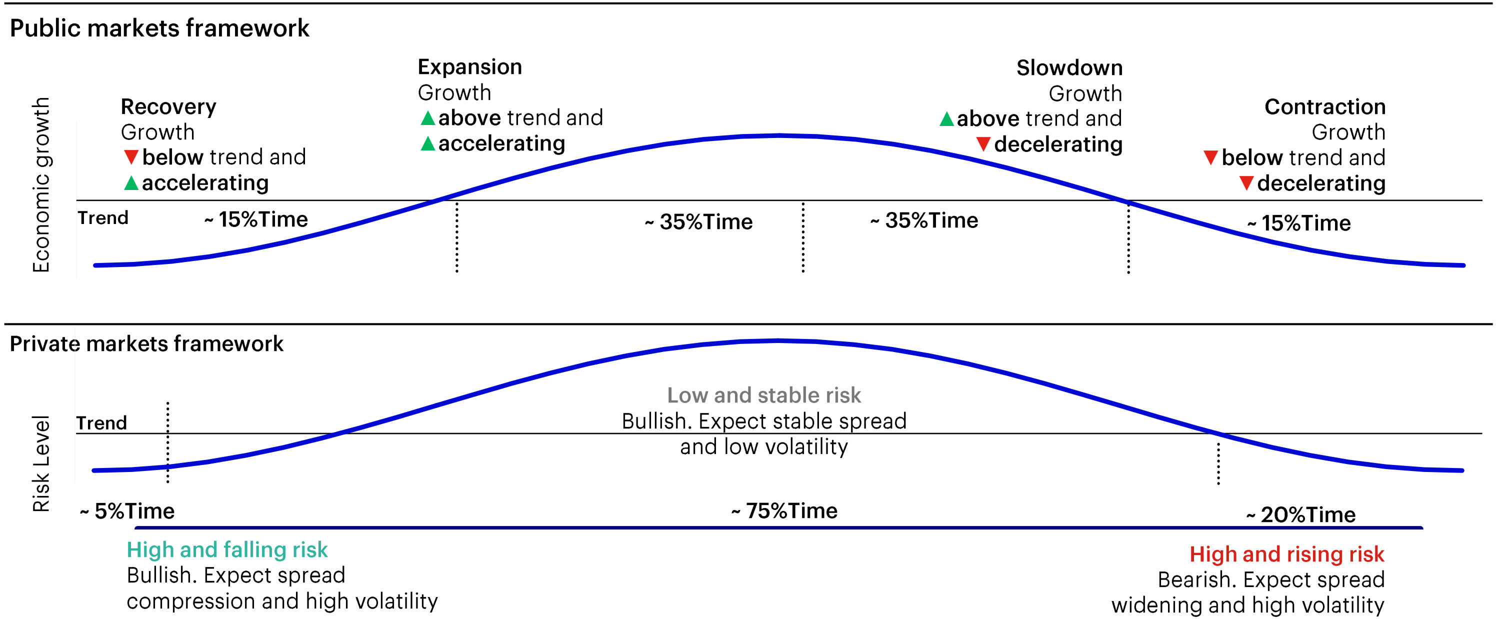
Contrasting our public and private markets frameworks

Due to the illiquid nature of private asset classes, we have built a more stable regime framework to reduce oscillation between buy and sell signals.

The public markets trend line focuses on economic growth through the business cycle, while the private markets chart focuses on the level of risk through the business cycle.



Source: Invesco Investment Solutions, as of Sept. 30, 2021.

Regime definitions

We have built a framework to compare the historical performance of each asset class to the expected return in each regime.

- Most of the time, the model is within the **low and stable risk** regime, signaling stable spreads and low volatility. This occurs when credit spreads are below the 75th percentile and is a bullish signal.
- The tails are used when risk is high but our views attempt to find turning points when risk is rising and falling.

Regimes outline

High and falling risk	Bullish > Expect meaningful spread compression, high volatility
Low and stable risk	Bullish > Expect stable spreads, and low volatility
High and rising risk	Bearish > Expect spread widening, high volatility

Model background

High and falling risk	Growth accelerating and credit spreads > 75th percentile
Low and stable risk	Credit spreads < 75th percentile
High and rising risk	Growth decelerating and credit spreads > 75th percentile or global contraction

Source: Invesco Investment Solutions, as of Sept. 30, 2021.

Ranking of attractiveness of asset classes by regime relative to history

The ranking outcomes are reasonably intuitive, where:

- In **high and rising** environments returns are challenged compared to their average.
- Most returns are around average in **low and stable** regimes, which is most of the time.
- Assets in a **high and falling** environment produce some of the best returns of a cycle in that short timeframe. A notable exception is Core RE, which is an outlier from the GFC that we do not necessarily anticipate to carry forward in future recessions.

Ranking performance relative to historical averages (regime divided by long-term average)

Regime	1st Lien	2nd Lien	LBO	GRTH	EVT	LVT	Core RE	Core Infra
Long-term average return	**6.2%**	**8.5%**	**13.9%**	**10.8%**	**16.4%**	**19.1%**	**4.8%**	**7.5%**
High and falling risk	49.1%	8.7%	25.9%	27.9%	3.7%	21.7%	-33.5%	7.7%
Ranking	5	3	5	5	1	3	1	3
Low and stable risk	6.6%	9.9%	16.3%	11.5%	18.8%	20.4%	9.6%	9.7%
Ranking	3	3	3	3	3	3	5	4
High and rising risk	-3.0%	1.8%	1.6%	4.9%	6.5%	9.5%	-3.6%	-1.7%
Ranking	1	1	1	1	1	1	1	1

Relative attractiveness	
>150%	Very attractive
120-150%	Attractive
80-120%	Neutral
50-80%	Unattractive
<50%	Very unattractive

Source: Invesco Investment Solutions, as of Sept. 30, 2021. The acronyms; LBO, GRTH, EVT, LVT, Core RE, and Core Infra, represents Leveraged Buyout, Growth Equity, Early-stage Venture, Late-stage Venture, Core Real Estate, and Core Infrastructure, respectively. Any reference to a ranking provides no guarantee for future performance results and is not constant over time.

Contrasting our public and private markets frameworks

Each private asset class in a **low and stable** environment outperforms their public market comparison but this is not the case in the higher risk regimes.

- There is a small sample size of high volatility periods captured over the past 15 years.
- We are investigating how we can improve our methodology for the more extreme regimes.

Ranking performance relative to public markets in the same period

Regime	LBO	GRTH	US LG	EVT	LVT	US SM	1st Lien	BSL	2nd Lien	Gbl HY	Core RE	Core Infra	REITs
High and falling risk	25.9%	27.9%	63.1%	3.7%	21.7%	79.9%	49.1%	57.1%	8.7%	79.3%	-33.5%	7.7%	124.3%
Ranking	1	1		1	1		3		1		1	1	
Low and stable risk	16.3%	11.5%	9.6%	18.8%	20.4%	7.5%	6.6%	3.6%	9.9%	4.8%	9.6%	9.7%	6.4%
Ranking	5	4		5	5		5		5		4	5	
High and rising risk	1.6%	4.9%	9.9%	6.5%	9.5%	16.0%	-3.0%	1.1%	1.8%	7.1%	-3.6%	-1.7%	2.8%
Ranking	1	1		1	2		1		1		1	1	

Relative attractiveness	
>150%	Very attractive
120-150%	Attractive
80-120%	Neutral
50-80%	Unattractive
<50%	Very unattractive

Source: Invesco Investment Solutions, as of Sept. 30, 2021. The acronyms; LBO, GRTH, US LG, EVT, LVT, US SM, BLS, Glb HY, Core RE, and Core Infra, represents Leveraged Buyout, Growth Equity, US Large Cap Equities, Early-stage Venture, Late-stage Venture, Broadly Syndicated Loans, Global High Yield, Core Real Estate, and Core Infrastructure, respectively. Any reference to a ranking provides no guarantee for future performance results and is not constant over time.

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Investment Solutions

Invesco Investment Solutions is an experienced multi-asset team that seeks to deliver desired client outcomes using Invesco's global capabilities, scale and infrastructure. We partner with you to fully understand your goals and harness strategies across Invesco's global spectrum of active, passive, factor and alternative investments that address your unique needs. From robust research and analysis to bespoke investment solutions, our team brings insight and innovation to your portfolio construction process. Our approach starts with a complete understanding of your needs:

We help support better investment outcomes by delivering insightful and thorough analytics. By putting analytics into practice, we develop investment approaches specific to your needs. We work as an extension of your team to engage across functions and implement solutions.

The foundation of the team's process is the development of capital market assumptions — long-term forecasts for the behavior of different asset classes. Their expectations for returns, volatility, and correlation serve as guidelines for long-term, strategic asset allocation decisions. Assisting clients in North America, Europe and Asia, Invesco's Investment Solutions team consists of over 75 professionals, with 20+ years of experience across the leadership team. The team benefits from Invesco's on-the-ground presence in 25 countries worldwide, with over 150 professionals to support investment selection and ongoing monitoring.

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CMA proxies and statistics

Invesco Investment Solutions (IIS) | United States Dollar (USD)

	Asset class	Underlying index (proxy)	10-year CMA[1]	10-year historical	CMA +/- History	10-year Arith. CMA	10-year exp. risk	Return/risk[2]	5-year CMA	5-year CMA less 10-year CMA
Fixed income	US Tsy	BBG BARC US Tsy	1.5	2.2	-	1.7	5.8	0.29	1.2	-0.4
	US TIPS	BBG BARC US TIPS	0.7	3.1	-	0.9	5.5	0.16	-0.4	-1.1
	US Bank Loans	CSFB Leverage Loan	4.1	5.0	-	4.4	8.5	0.52	3.3	-0.8
	US Agg	BBG BARC US Agg	1.9	3.0	-	2.0	5.9	0.35	1.3	-0.5
	US MBS	BBG BARC US MBS	2.4	2.4	+	2.7	6.5	0.41	2.1	-0.4
	US IG Corp	BBG BARC US IG	1.7	4.9	-	2.0	7.6	0.26	0.4	-1.3
	US HY Corps	BBG BARC US HY	3.1	7.4	-	3.6	10.1	0.35	1.8	-1.3
	Global Agg	BBG BARC Global Agg	2.2	1.9	+	2.4	6.7	0.36	1.5	-0.7
	Global Agg ex-US	BBG BARC Global Agg ex-US	2.4	0.9	+	2.9	10.2	0.28	1.5	-0.9
	US Muni	BOA ML US Muni	1.7	4.0	-	2.0	7.2	0.27	1.3	-0.4
	EM Agg	BBG BARC EM Agg	3.4	5.7	-	4.2	13.1	0.32	2.6	-0.7
	China Policy Bk & Tsy	BBG BARC China PB Tsy TR	2.0	4.3	-	2.1	5.3	0.40	1.4	-0.5
	China RMB Credit	BBG BARC China Corporate	2.4	5.2	-	2.6	4.5	0.56	1.7	-0.7

1 Returns are geometric unless otherwise stated. These estimates reflect the views of IIS, the views of other investment teams at Invesco may differ from those presented here.
2 Risk/Return is calculated using the 10-year, Arithmetic Capital Market Assumption divided by Expected Risk.
Source: IIS proprietary research as of Sept. 30, 2021. Performance, whether actual or simulated, does not guarantee future results. These estimates are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions. Please see the following slides for a summary of our CMA methodology and our CMA paper for detailed information about our CMA methodology.

CMA proxies and statistics

Invesco Investment Solutions (IIS) | United States Dollar (USD)

	Asset class	Underlying index (proxy)	10-year CMA[1]	10-year historical	CMA +/- History	10-year Arith. CMA	10-year exp. risk	Return/risk[2]	5-year CMA	5-year CMA less 10-year CMA
Equity	Global Equity	MSCI ACWI	7.2	12.5	-	8.5	17.0	0.50	8.2	1.1
Equity	China Large Cap	CSI 300	9.5	8.7	+	14.5	35.1	0.41	10.7	1.2
Equity	US Large Cap	S&P 500	6.7	16.6	-	8.0	16.7	0.48	7.4	0.8
Equity	US Mid Cap	Russell Midcap	7.7	15.5	-	9.4	19.6	0.48	9.1	1.4
Equity	US Small Cap	Russell 2000	9.3	14.6	-	11.6	23.1	0.50	12.0	2.7
Equity	EAFE Equity	MSCI EAFE	7.3	8.6	-	8.8	18.7	0.47	8.7	1.5
Equity	Europe Equity	MSCI Europe	7.9	8.8	-	9.4	18.8	0.50	9.6	1.7
Equity	UK Large Cap	FTSE 100	8.9	5.8	+	10.6	20.1	0.53	9.9	1.0
Equity	Canada Equity	S&P TSX	7.0	6.7	+	8.9	20.4	0.43	8.3	1.3
Equity	Japan Equity	MSCI JP	5.4	8.7	-	7.7	22.5	0.34	6.0	0.6
Equity	EM Equity	MSCI EM	9.2	6.5	+	11.9	25.2	0.47	10.9	1.7
Equity	APAC ex-JP	MSCI APXJ	8.8	8.8	-	11.5	25.3	0.46	10.8	2.0
Alternatives	US REITs	FTSE NAREIT Equity	8.6	12.1	-	10.2	18.7	0.55	6.9	-1.7
Alternatives	Global REITs	FTSE EPRA/NAREIT Developed	8.1	9.3	-	9.6	18.5	0.52	6.5	-1.6
Alternatives	HFRI Hedge Funds	HFRI HF	7.1	5.4	+	7.5	8.8	0.85	8.0	0.8
Alternatives	GS Commodities	S&P GSCI	4.9	-4.8	+	7.4	23.8	0.31	1.7	-3.2

1 Returns are geometric unless otherwise stated. These estimates reflect the views of IIS, the views of other investment teams at Invesco may differ from those presented here.
2 Risk/Return is calculated using the 10-year, Arithmetic Capital Market Assumption divided by Expected Risk.
Source: IIS proprietary research as of Sept. 30, 2021. Performance, whether actual or simulated, does not guarantee future results. These estimates are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions. Please see the following slides for a summary of our CMA methodology and our CMA paper for detailed information about our CMA methodology.

Investment risks

Investment risks

The value of investments and any income will fluctuate (this may partly be the result of exchange rate fluctuations) and investors may not get back the full amount invested.

Invesco Investment Solutions develops CMAs that provide long-term estimates for the behavior of major asset classes globally. The team is dedicated to designing outcome-oriented, multi-asset portfolios that meet the specific goals of investors. The assumptions, which are based on 5- and 10-year investment time horizons, are intended to guide these strategic asset class allocations. For each selected asset class, we develop assumptions for estimated return, estimated standard deviation of return (volatility), and estimated correlation with other asset classes. This information is not intended as a recommendation to invest in a specific asset class or strategy, or as a promise of future performance. Estimated returns are subject to uncertainty and error and can be conditional on economic scenarios. In the event a particular scenario comes to pass, actual returns could be significantly higher or lower than these estimates.

Disclosures

Disclosures

About our capital market assumptions methodology

We employ a fundamentally based "building block" approach to estimating asset class returns. Estimates for income and capital gain components of returns for each asset class are informed by fundamental and historical data. Components are then combined to establish estimated returns. Here we provide a summary of key elements of the methodology used to produce our long-term (10-year) and medium-term (5-year) estimates. **Fixed income returns** are composed of; the average of the starting (initial) yield and the expected yield for bonds, estimated changes in valuations given changes in the Treasury yield curve, roll return which reflects the impact on the price of bonds that are held over time, and a credit adjustment which estimates the potential impact on returns from credit rating downgrades and defaults. **Equity returns** are composed of; a dividend yield, calculated using dividend per share divided by price per share, buyback yield, calculated as the percentage change in shares outstanding resulting from companies buying back or issuing shares, valuations change, the expected change in value given the current Price/Earnings (P/E) ratio and the assumption of reversion to the long-term average P/E ratio, and the estimated growth of earnings based on the long-term average real GDP per capita and inflation. **Alternative returns** are composed of; a variety of public versus private assets with heterogenous drivers of return given their distinct nature. They range from a beta driven proxy to public markets or a bottom up, building block methodology like that of fixed income or equities depending whether they are more bond like or stock like. **Volatility estimates** for the different asset classes, we use rolling historical quarterly returns of various market benchmarks. Given that benchmarks have differing histories within and across asset classes, we normalize the volatility estimates of shorter-lived benchmarks to ensure that all series are measured over similar time periods.

Important information

Unless otherwise stated, all information is sourced from Invesco Investment Solutions, in USD and as of Sept. 30, 2021.

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