



Core Commercial Real Estate Debt

An “All Season” Strategic Investment Opportunity



Many institutional investors seeking to manage risk within their real estate allocations were historically limited to core equity strategies either through funds, separate accounts, or direct ownership. This paper will explore private commercial mortgages, which have consistently delivered superior risk-adjusted returns relative to public stocks, bonds, and core equity real estate for more than three decades (see section “Strategic Attributes of Core Commercial Real Estate Debt”). More recently, institutional investors have been able to access the private commercial real estate (CRE) debt asset class through various investment vehicles. We believe that core CRE debt could serve as both a compelling alternative, as well as a complement, to core real estate equity and other fixed income asset classes. Investors seeking stable income returns with a level of downside protection¹ from real asset exposure should consider the merits of a long-term strategic allocation to core CRE debt as it provides:

- **An “All-season” investment strategy.** Core CRE debt has delivered higher cash income returns than core CRE equity and other fixed-income instruments such as investment-grade corporate bonds consistently across multiple market cycles (see section “Strategic Attributes of Core Commercial Real Estate Debt”). The two main contributing factors to these historical trends involve structural protection and persistent borrower demand for first mortgage debt. As a result, core CRE debt emerged from the Global Financial Crisis (GFC) relatively unscathed. More recently, the COVID-19 pandemic has again put core CRE debt to the test, and while the recession’s full impact is still unfolding, core CRE debt is demonstrating its resiliency.²
- **Exposure to a large addressable market.** There are \$4.7 trillion in U.S. commercial mortgage loans currently outstanding.³ The size of the market offers institutional investors the depth and liquidity required to match against their liabilities. Yet, the asset class is often underrepresented in investors’ portfolios, largely due to a lack of appropriate investment channels.
- **Low volatility, robust current income with downside protection.** U.S. commercial mortgages have generated long-term income returns secured by a lien on the underlying commercial property and historically protected by equity subordination of approximately 30%.⁴ As a result, core CRE debt exhibits low volatility of income with historical default rates in line with investment grade commercial bonds over the past twenty years.⁵ The historical spread premium for core debt income averages 279 basis points (bps) over the 10-year treasury for three decades versus only 17 basis bps for real estate equity cash income returns (see section “Structured for Downside Protection”).
- **Portfolio enhancement.** U.S. commercial mortgage loans combine many of the positive aspects offered by both fixed income and commercial real estate equity including inflation-hedged income returns, stable cashflows, principal protection backed by a hard asset, a deep investor pool, and enhanced diversification potential. This paper will show that adding commercial mortgage loans may enhance portfolio construction whether as part of investors’ real estate portfolios or as their fixed income allocation.
- **Duration and liquidity.** The hold period for institutional core CRE equity investors is approximately 14 years on average.⁶ Core CRE debt strategies can offer much shorter durations, allowing investors to pivot readily in response to shifting secular trends (see section “Duration and Liquidity”). Relatively short duration investments also promote liquidity as investor capital is not locked up for long periods and can be distributed or reinvested more frequently than longer duration ones.

Increased capital into the space has encouraged many new entrants into the space. Given broader recognition of the portfolio-enhancing benefits of core CRE debt, we expect continued investor inflows into the asset class. For first-time institutional investors, proper active management of a core CRE debt strategy is especially critical in the COVID-19 era as the pandemic has profoundly affected risk factors related to current and future real estate demand with important implications for loan underwriting.

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Overview of Commercial Real Estate Debt Investment

Private CRE debt investment falls into two broad categories: senior and subordinated debt. Senior mortgages are secured by the underlying property, and senior mortgage holders have priority as well as certain bankruptcy protections over those holding subordinated debt in the event of a default/liquidation. While loan structure is a critical determinant of senior mortgages, we believe property type, duration, and a sponsor's business plan, and loan-to-value (LTV) are also important characteristics when assessing overall risk and return. Subordinated debt is generally secured by a pledge of interest in the borrowing entity as opposed to the underlying property itself.

Within this categorization framework, senior and subordinated commercial real estate loans are further differentiated by leverage level, property type, duration, and sponsor business plan. Subject to prudent underwriting, these factors will determine the relative risk and return profile of a debt investment whether senior or subordinated. "Cash Flowing" versus "Non-Cash Flowing" mezzanine debt references the degree of tenant disruption associated with the planned property rehabilitation or redevelopment. Greater disruption should accompany higher debt costs to account for greater business plan risk. Construction loans (whether senior or subordinated) involve significantly greater business plan risk due to the development process than loans on stabilized properties. Figure 1 compares the key structural aspects of private CRE debt.

Figure 1.
Categories of Private CRE Debt

Real Estate Debt Investment Categories					
	Loan Type	Typical Loan-to-Value (LTV)	Rate Type	Typical Term (Years)	
Senior	Stabilized	≤ 65%	Fixed/Floating	7+	Core CRE Debt
	Light Transition	≤ 70%	Floating	3 to 5	
	Moderate Transitional	≤ 80%	Floating	3 to 5	
Subordinated	Cash Flowing Mezzanine	50% to 85%	Fixed/Floating	3 to 10	
	Non-Cash Flowing Mezzanine	60% to 80%	Fixed/Floating	3 to 10	
Construction	Construction	40% to 80%	Floating	1 to 5	

For illustrative purposes only. Based on Ares' view of the current market as of Q3 2020.

Core Commercial Real Estate Debt Characteristics

As referenced in Figure 1, we believe that senior first mortgage loans on stabilized properties fall into the core risk profile while construction loans and non-cash flowing mezzanine would be considered “non-core.” When categorizing senior mortgages on light transitional and moderate transitional properties and cash flowing mezzanine loans, the definition of core can be somewhat fluid.

This view is guided by the philosophy about the role core CRE debt should play in investors’ portfolios: real estate debt should be a long-term strategic exposure that can withstand economic and market cycles, included highly stressed periods. Our definition of “core” real estate debt encompasses:

- **Senior mortgage loans.** Senior mortgage loans have a first lien on the underlying collateral and therefore offer investors the flexibility to rectify issues including restructuring of loan terms, obtaining additional equity from the borrower, and potentially foreclosure. This level of flexibility is less available to subordinate debt holders.
- **Stabilized Loan-to-Value (LTVs) $\leq 70\%$.** During downturns, first mortgage loans, by nature of their seniority within the capital stack, have greater structural protection than the borrower’s equity position. Considering that property values fell by 27% during the GFC – the most severe market downturn in recorded commercial real estate history, we believe first mortgage loans with equity subordination of 30% or greater at stabilization have a higher probability of withstanding future value corrections.⁷
- **Backed by institutional-quality assets.** Underlying collateral should be suited to long-term institutional ownership with any disruption to property cash flows being minimal and transient.
- **Located in major metro areas with deep transactional liquidity.** Underlying property should be located within a top 30 metropolitan area, which have diversified and mature employment bases, stable demographic trends, and ample transactional liquidity. In our view, smaller, tertiary metro areas disproportionately experience liquidity challenges during periods of dislocation and therefore are not appropriate for a core CRE debt strategy.

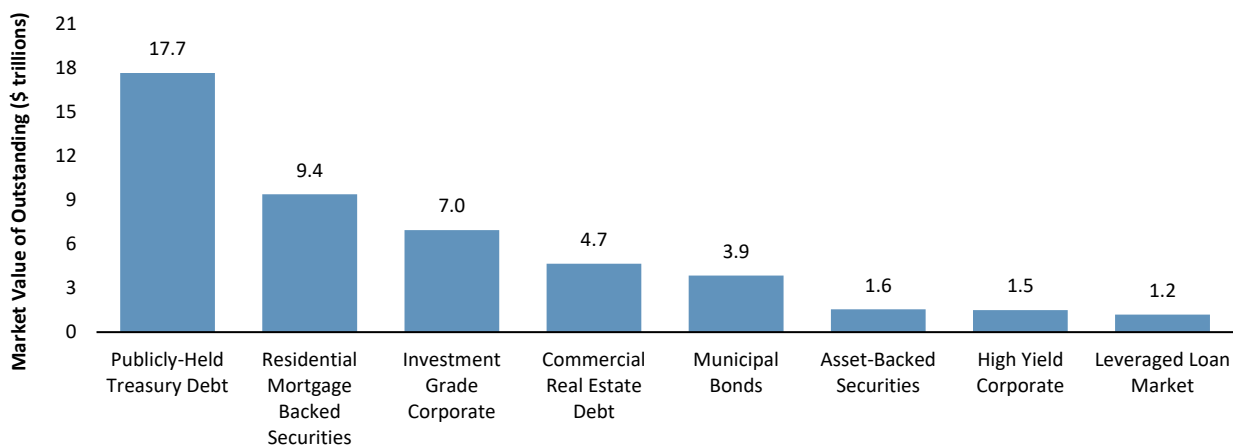


Commercial Real Estate Debt is a Large, Investible Market

There are \$4.7 trillion of commercial mortgages outstanding inclusive of securitized mortgages, making it one of the largest fixed income asset classes.⁸ In terms of size, it sits between U.S. investment grade corporate bonds and municipal bonds (Figure 2). Given its size and long history, we believe the U.S. commercial mortgage market can provide the level of depth, long-term liquidity, and price stability required for a long-lived strategic allocation. Yet, less than 10% of private mortgages are held by institutional⁹ investors pointing to an opportunity to address underserved borrower demand.

Figure 2.

Comparison of U.S. Fixed-Income Investment Asset Classes by Estimated Market Size as of Q1 2020



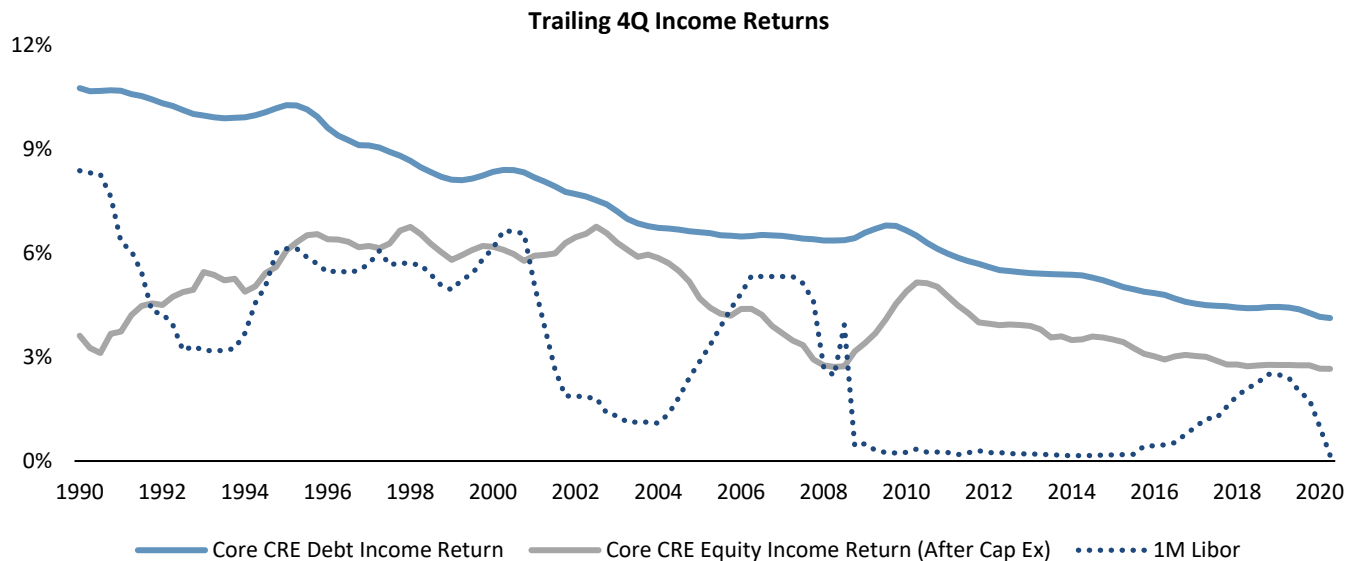
For illustrative purposes only. Sources referenced include Department of the Treasury as of Q1 2020 for “Publicly-Held Treasury Debt”, Securities Industry and Financial Markets Association (SIFMA) and Federal Reserve as of Q1 2020 for “Residential Mortgage-Backed Securities”, SIFMA and S&P Global as of Q1 2020 for “Investment Grade Corporate”, Federal Reserve as of Q1 2020 for “Commercial Real Estate Debt”, SIFMA and Municipal Securities Rules-Making Board (MSRB) as of Q1 2020 for “Municipal Bonds”, SIFMA and S&P Global as of Q1 2020 for “High-Yield Corporate”, SIFMA as of Q4 2019 for “Asset-Backed Securities”, Bank for International Settlements for “Leveraged Loans”. Please refer to section “Index Definitions” for additional information.

Structured for Downside Protection, and Durable, Steady Income

Core CRE debt has experienced very low default rates over the past 20 years due primarily to significant equity subordination, which provides principal protection¹⁰ even in the most volatile market periods.¹¹ Core CRE debt loan-to-values have averaged 66% since 1990 and 68% over the past 40 years, providing a 30% buffer against property value declines.¹² The core property market has never experienced an aggregate value loss of greater than 30% as measured by the NCREIF market value index (MVI).¹³ The most severe price decline in the history of the NCREIF Property Index happened during the GFC when the index fell by 27%.¹⁴ Even during the extended market downturn that spanned the back-to-back recessions of 1990 and 1991, the index declined by only 24%.¹⁵ While lenders will continue to experience the impact of economic downturns on their loan portfolios, we believe adherence to time-tested leverage levels will continue to result in very low default rates and, in the unlikely event of a default, high recovery rates.

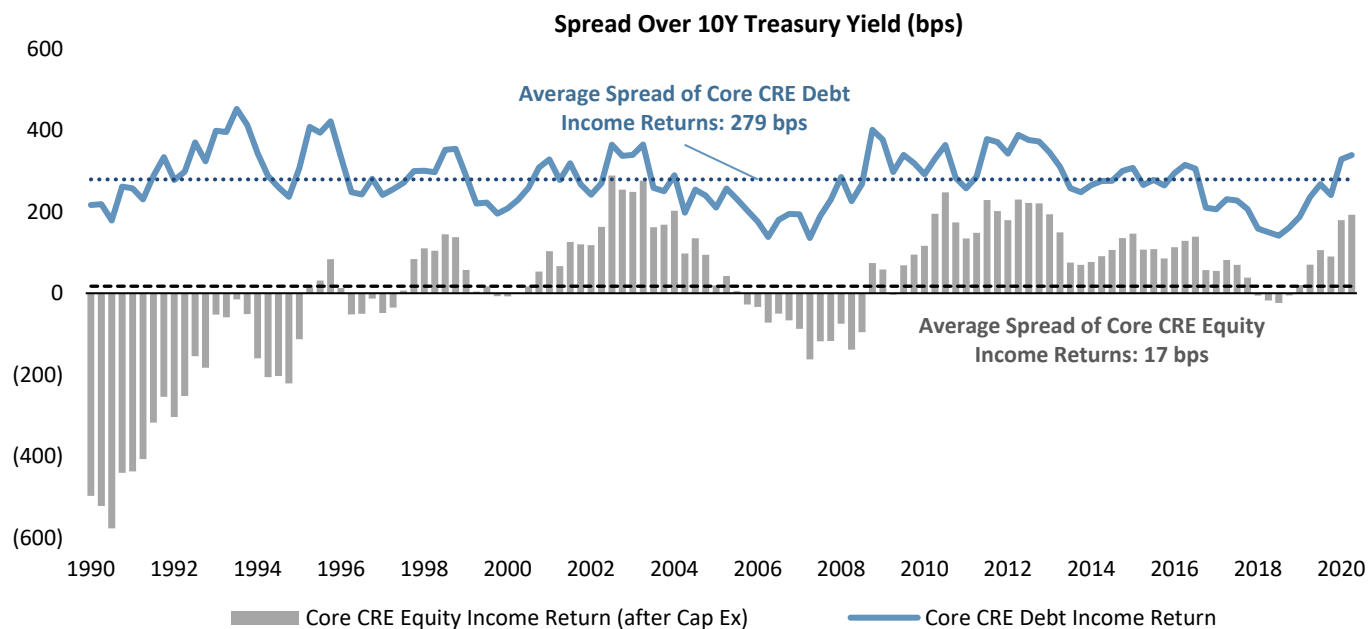
Core CRE debt income returns exhibit less cyclicalities than core CRE equity income returns (Figure 3). For core CRE equity income returns, we use the income return after deducting for routine capital expenditures – essentially a truer cash income return – for an “apples-to-apples” comparison with core debt income returns. **Importantly, the historical spread premium for core debt income is robust and stable, averaging 279 basis points (bps) over the 10-year treasury for three decades versus only 17 basis bps for real estate equity cash income returns (Figure 4).**

Figure 3.
Core CRE Debt Offers Capital Structure Seniority and Historically Higher Income Returns Relative to Equity as of Q2 2020



For illustrative purposes only. Indices referenced include: the Giliberto-Levy Commercial Mortgage Performance Index as of Q2 2020 for “Core CRE Debt Income Return”, the National Council of Real Estate Investment Fiduciaries (NCREIF) Property Index as of Q2 2020 for “Core CRE Equity Income Return (After Cap Ex)”, and the ICE Benchmark Administration for “1M Libor”. Please refer to section “Index Definitions” for additional information.

Figure 4.
Core CRE Debt Income Returns Have Maintained a Higher Average Spread than Core CRE Equity as of Q2 2020

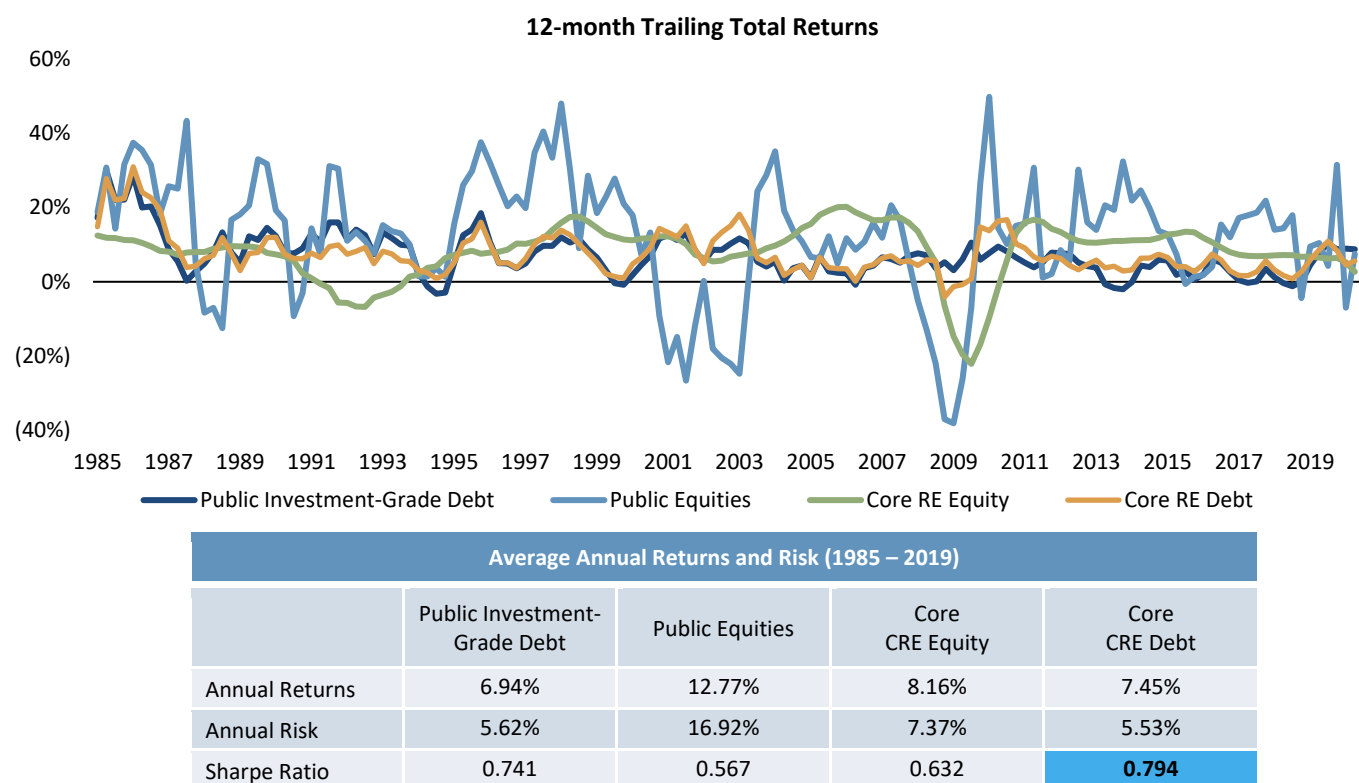


For illustrative purposes only. Indices referenced include: the Giliberto-Levy Commercial Mortgage Performance Index as of Q2 2020 for “Core CRE Debt Income Return”, the NCREIF Property Index as of Q2 2020 for “Core CRE Equity Income Return (after Cap Ex)”, and Federal Reserve as of Q2 2020 for “10Y Treasury Yields”. Please refer to section “Index Definitions” for additional information.

We believe Core CRE Debt offers a deep investible asset class tied to an expanding universe of high-quality real estate properties with informational transparency at the property-level. The asset class is also seasoned having emerged from each successive real estate downturn since the 1980s with improved downside protection borne of improved underwriting discipline.¹⁶ **Delinquency rates on direct core loans have averaged below 0.5% over the past 20 years and are 0.05% as of Q2 2020.**¹⁷

The risk-adjusted return profile of core CRE debt stands out when comparing against long-term historical performance of other asset classes including public debt, public equity, and core equity real estate. This can be illustrated by the Sharpe Ratio (Figure 5), which divides the return of a portfolio over a risk-free rate (i.e. excess return) by the standard deviation of excess returns, one can see that **core CRE debt has offered attractive risk-adjusted return performance relative to these asset classes since 1985 based upon the Sharpe ratio.**

Figure 5.
Comparison of Annual Risk and Return Across Asset Classes as of Q2 2020



For illustrative purposes only. Indices referenced include the Bloomberg Barclays Capital US Aggregate Bond Index as of Q2 2020 for “Public Investment-Grade Debt”, the S&P 500 Index as of Q2 2020 for “Public Equities”, the NCREIF Property Index as of Q2 2020 for “Core CRE Equity”, the Gliberto-Levy Commercial Mortgage Performance Index as of Q2 2020 for “Core CRE Debt”. Sharpe Ratio calculation uses 3-month T-bill yield as risk-free rate. Please refer to section “Index Definitions” for additional information.

When the COVID-19 pandemic struck, it presented the most severe test of core CRE debt since the GFC. While the pandemic has been a unique, fast-moving market, core CRE debt has held up better than both stocks and core CRE equity through the first half of 2020 based upon annual returns as the table on the right illustrates. The public bond market benefited directly from the massive amount of monetary stimulus the Federal Reserve put forth early into the crisis as its trailing four quarter return of 8.7% is well above its historical average of 5.7%.¹⁸

Post-COVID-19 Total Return Snapshot		
	YTD 2020 Q2	Last 4Q
Stocks	-3.1%	7.5%
Bonds	6.1%	8.7%
Core CRE Equity	-0.3%	2.7%
Core CRE Debt	3.3%	5.6%

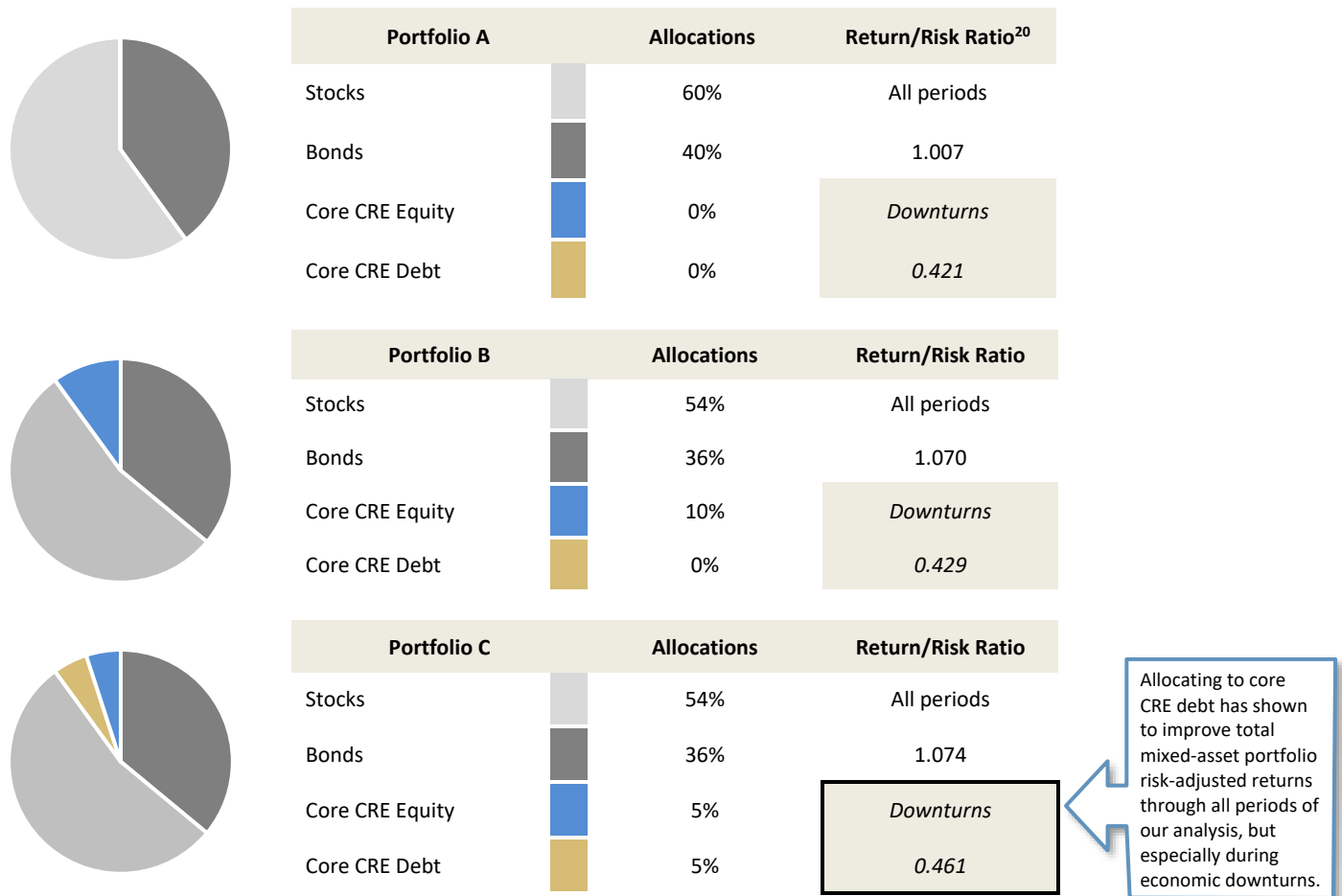
Sources same as for “Average Annual Returns and Risk” table above.

A Complement to Core Commercial Real Estate Equity

We believe asset class diversification is one of the primary reasons why institutional investors allocate to CRE, encompassing both debt and equity. Most institutional investors who have had longstanding allocation to core CRE equity understand its diversification utility. **However, most institutional investors tend not to be aware that an allocation to core CRE debt in addition to core CRE equity may further enhance risk-adjusted mixed-asset portfolio returns especially through a market downturn.**

Figure 6.¹⁹

A Hypothetical 5% Allocation to Core Debt Can Enhance Mixed-Asset Portfolio Performance Through a Recession



For illustrative purposes only. The results shown represent hypothetical backtests of historical index returns from Q1 1985 to Q2 2020. Indices referenced include the Bloomberg Barclays US Aggregate Bond Index for "Bonds", the S&P 500 for "Stocks", the NFI-ODCE for "Private CRE Equity", and the Gliberto-Levy Index Commercial Mortgage Performance Index for "Private CRE Debt". Downturns refer to recessions as defined by the National Bureau of Economic Research (NBER) plus four-quarters to account for the lagged nature of real estate values. The four quarters after each recession are added on because of the lagged nature of real estate values except for the 2020 recession. Please refer to endnote 14 and section "Index Definitions" for additional information on the results shown.

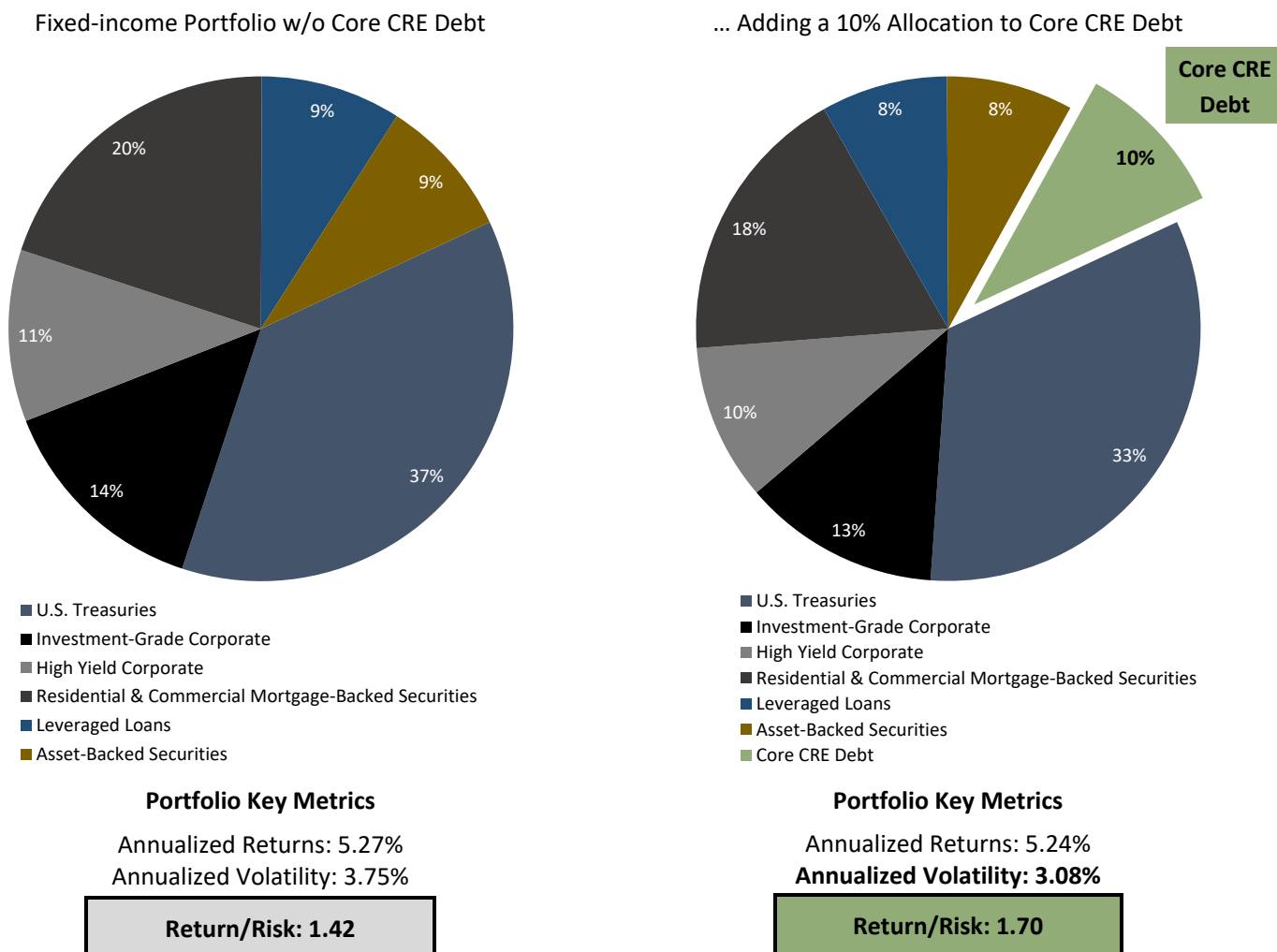
Figure 6 details the improvement in diversification that can occur by adding an allocation to core debt to a hypothetical portfolio of stocks and bonds (Portfolio A) and a portfolio of stocks, bonds, and core CRE equity (Portfolio B) especially during market downturns. During recessions, the return/risk ratio for Portfolio C improves by 10% over Portfolio A (no real estate) and 8% over Portfolio B (allocation to core equity). Finally, over the entire historical period, Portfolio C demonstrates a higher return/risk ratio than either of the other two portfolios. While this theoretical framework illustrates the diversification benefits of commercial real estate exposure on paper, institutional investors have realized this in practice and have steadily increased their allocation thresholds to the asset class over time as a result.²¹

A Complement to Investment Grade Corporate Bonds

To demonstrate a way that core CRE debt may enhance risk-adjusted returns, we constructed two hypothetical fixed income portfolios illustrated below, one without an allocation to core CRE debt (left) and one with an allocation (right). Using historical returns over a 20-year period, we illustrate how a 10% allocation of senior direct mortgages to a fixed income portfolio could improve risk-adjusted returns by 21% (Figure 7). Construction of the hypothetical portfolios was made by Ares Real Estate Research using market data from Q1 1998 to Q2 2020.

Figure 7.²²

A 10% allocation to core CRE debt could enhance a fixed-income portfolio's risk-adjusted return by 21%



For illustrative purposes only. Construction of the hypothetical portfolios was made by Ares Real Estate Research using market data from Q1 1998 to Q2 2020. The hypothetical back-tested results shown were derived from adding a hypothetical 10% allocation to core real estate debt to the hypothetical fixed income portfolio from Q1 1998 to Q2 2020. Indices referenced include the Bloomberg Barclays US Treasury Index as of Q2 2020 for "U.S. Treasuries", the ICE BofA US Corporate Index as of Q2 2020 for "Investment-Grade Corporate", the ICE BofA US High Yield Index as of Q2 2020 for "High Yield Corporate", the Bloomberg Barclays US CMBS Investment Grade Index as of Q2 2020 for "Commercial Mortgage-Backed Securities", the Bloomberg Barclays US MBS Index as of Q2 2020 for "Residential Mortgage-Backed Securities", the Bloomberg Barclays US ABS Index as of Q2 2020 for "Asset-Backed Securities", Credit Suisse Leveraged Loan Index as of Q2 2020 for "Leveraged Loans", and Giliberto-Levy Commercial Mortgage Performance Index as of Q2 2020 for "Core CRE Debt". Please refer to endnote 17 and section "Index Definitions" for additional information on the results shown.

Duration and Liquidity

We believe the secular tailwinds that informed real estate investment over the previous cycle are evolving in the aftermath of the deepest recession of the postwar era brought about by the tragedy of the COVID-19 pandemic. Certain existing trends have been accelerated as in the case of e-commerce's effect on industrial warehouse demand while other trends are reversing as in the case of office space densification. Institutional investment in core equity real estate is characterized by long hold periods. In any given year, approximately 7% of the properties constituting the \$696 billion NCREIF Property Index transact, meaning a core property trades about once every 14 years on average.²³ However, a core real estate debt strategy can invest across a much shorter duration as referenced in Figure 1, allowing for strategic pivots during major inflection points as we are currently seeing.

We believe core CRE debt strategies may offer the liquidity required to make the asset class a strategic allocation. Since a core CRE debt strategy should prioritize stability of income and downside protection²⁴, we believe the asset class offers the liquidity investors need to dynamically rebalance their exposure as dictated by their own mixed-asset portfolio needs.

Conclusion

Core real estate debt not only offers a tactical opportunity in the current environment but also presents strong merits for inclusion as a long-term, "all-season" strategic allocation in investors' portfolios. Valued at \$4.7 trillion²⁵, we believe the U.S. commercial mortgage market asset class may offer institutional investors the depth and liquidity required to match against their liabilities. As an investment asset class, we believe commercial mortgage loans combine many of the positive aspects of both fixed income and commercial real estate equity and may enhance portfolio diversification whether as part of an investor's real estate allocation or as part of an investor's fixed income portfolio

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REF: RE-01443

Endnotes

- ¹ References to downside protection are not guarantees against loss of investment capital or value.
- ² Based upon historical total returns of the Giliberto-Levy (G-L), National Council of Real Estate Investment Fiduciaries (NCREIF) Property, and Standard & Poor's (S&P) 500 indices. See Index Definitions section for more detail.
- ³ Source: Federal Reserve as of Q2 2020.
- ⁴ Based upon historical data from the American Council of Life Insurers (ACLI) as of Q4 2018.
- ⁵ Based upon analysis of Moody's corporate bond defaults and ACLI mortgage defaults from 1998 to 2018.
- ⁶ NCREIF as of Q2 2020.
- ⁷ Ibid.
- ⁸ Source: Federal Reserve as of Q1 2020.
- ⁹ Excluding banks and insurance companies; source: Federal Reserve as of Q1 2020.
- ¹⁰ See Note 1.
- ¹¹ Source: American Council of Life Insurers (ACLI) as of Q4 2018.
- ¹² Ibid.
- ¹³ Source: Market Value Index published by the National Council of Real Estate Investment Fiduciaries (NCREIF) as of Q2 2020.
- ¹⁴ Ibid.
- ¹⁵ Ibid.
- ¹⁶ See Note 1.
- ¹⁷ Source: ACLI as of Q4 2018.
- ¹⁸ Source: Bloomberg as of Q2 2020.
- ¹⁹ In portfolio A, the hypothetical back-tested results shown were derived from adding a hypothetical 60% allocation to Stocks and a hypothetical 40% allocation to Bonds from Q1 1985 to Q2 2020. In portfolio B, they hypothetical back-tested results shown were derived from adding a hypothetical 54% allocation to Stocks and a hypothetical 36% allocation to Bonds, and a hypothetical 10% allocation to Core CRE Equity from Q1 1985 to Q2 2020. In portfolio C, the hypothetical back-tested results shown were derived from adding a hypothetical 54% allocation to Stocks and a hypothetical 36% allocation to Bonds, a hypothetical 5% allocation to Core CRE Equity, and a hypothetical 5% allocation to Core CRE Debt from Q1 1985 to Q2 2020. Construction of the hypothetical portfolios was made by Ares Real Estate Research using market data from Q1 1985 to Q2 2020. The hypothetical portfolios shown do not represent an actual portfolio or results that have been or will be achieved. It is expected that an actual Ares-managed portfolio will differ in timing and composition from the hypothetical portfolios and will be assembled over time. The hypothetical portfolio shown are based on the hypothetical allocations shown. There can be no assurance future portfolios will exhibit similar compositions or outcomes to those shown. Hypothetical performance results have many inherent limitations, some of which, but not all, are noted herein. No representation is being made that any fund or account will or is likely to achieve profits or losses similar to those shown herein. As with any investment, there is always the potential for gains as well as the possibility of losses. There are frequently sharp differences between hypothetical performance results and the actual results subsequently realized by any particular trading program. Hypothetical back-tested performance is developed with the benefit of hindsight. This means that the performance results shown are not based on the performance of an actual portfolio. There are factors related to the markets in general, or to the implementation of any specific portfolio strategy, which cannot be fully accounted for in the preparation of hypothetical performance, all of which can adversely affect actual portfolio results. The hypothetical results presented herein represent the application of the back-test as currently in effect during the indicated time period. Other periods selected may have different results, including losses. Hypothetical portfolio performance does not involve financial risk, and therefore cannot completely account for the impact of financial risks associated with actual acquisition and disposition of an asset.
- Diversification does not assure profit or protect against market loss. The comparison presented herein is intended to serve as a general indication of the potential returns that might be experienced in relation to a core real estate debt portfolio vs a core real estate equity portfolio. There can be significant differences in terms of portfolio composition, risk, liquidity, etc. between portfolios involving these two asset classes and caution should be exercised when attempting to compare the two based solely on hypothetical returns of two different indexes, neither of which represent actual investment opportunities.
- NBER recessions are documented at <https://www.nber.org/cycles.html>.
- ²⁰ The Return/Risk ratio is calculated by dividing annualized quarterly total returns by annualized standard deviation of quarterly returns. This measure of risk-adjusted returns does not reference a risk-free rate as does the Sharpe ratio.
- ²¹ Note that diversification does not ensure a profit or protect against market loss.
- ²² The hypothetical portfolios shown do not represent an actual portfolio or results that have been or will be achieved. It is expected that an actual Ares-managed portfolio will differ in timing and composition from the hypothetical portfolios and will be assembled over time. The hypothetical portfolio shown are based on the hypothetical allocations shown. There can be no assurance future portfolios will exhibit similar compositions or outcomes to those shown. Hypothetical performance results have many inherent limitations, some of which, but not all, are noted herein. No representation is being made that any fund or account will or is likely to achieve profits or losses similar to those shown herein. As with any investment, there is always the potential for gains as well as the possibility of losses. There are frequently sharp differences between hypothetical performance results and the actual results subsequently realized by any particular trading program. Hypothetical back-tested performance is developed with the benefit of hindsight. This means that the performance results shown are not based on the performance of an actual portfolio. There are factors related to the markets in general, or to the implementation of any specific portfolio strategy, which cannot

be fully accounted for in the preparation of hypothetical performance, all of which can adversely affect actual portfolio results. The hypothetical results presented herein represent the application of the back-test as currently in effect during the indicated time period. Other periods selected may have different results, including losses. Hypothetical portfolio performance does not involve financial risk, and therefore cannot completely account for the impact of financial risks associated with actual acquisition and disposition of an asset.

Hypothetical portfolio adapted from the Summer 2018 PREA Quarterly Article “Long-Term CRE Mortgages – A Compelling Fixed Income Alternative” by Tony Charles and Jeff Friedman. Hypothetical portfolio returns represent total, unhedged returns in USD. Hypothetical portfolio returns are based on historical asset class benchmark returns from Q1 1998 to Q2 2020.

²³ NCREIF as of Q2 2020.

²⁴ See Note 1.

²⁵ Source: Federal Reserve as of Q1 2020.

Index Definitions

Indices are provided for illustrative purposes only and are not indicative of any investment. Rather, the indices are provided solely to illustrate the performance of well-known and widely recognized indices. Indices do not reflect the deduction of fees and expenses and an investor cannot invest directly in an index.

The Bloomberg Barclays Capital US Aggregate Bond Index measures the performance of the U.S. investment grade bond market. The index invests in a wide spectrum of public, investment-grade, taxable, fixed income securities in the United States – including government, corporate, and international dollar-denominated bonds, as well as mortgage-backed and asset-backed securities, all with maturities of more than 1 year. To be included in the index, bonds must be rated investment grade (at least Baa3/BBB) by Moody's and S&P.

The Bloomberg Barclays US Treasury Index measures US dollar-denominated, fixed-rate, nominal debt issued by the US Treasury.

ICE BofA US Corporate Index tracks the performance of US dollar denominated investment grade rated corporate debt publicly issued in the US domestic market. To qualify for inclusion in the index, securities must have an investment grade rating (based on an average of Moody's, S&P, and Fitch) and an investment grade rated country of risk (based on an average of Moody's, S&P, and Fitch foreign currency long term sovereign debt ratings). Each security must have greater than 1 year of remaining maturity, a fixed coupon schedule, and a minimum amount outstanding of \$250 million.

ICE BofA US High Yield Index value tracks the performance of US dollar denominated below investment grade rated corporate debt publicly issued in the US domestic market. To qualify for inclusion in the index, securities must have a below investment grade rating (based on an average of Moody's, S&P, and Fitch) and an investment grade rated country of risk (based on an average of Moody's, S&P, and Fitch foreign currency long term sovereign debt ratings). Each security must have greater than 1 year of remaining maturity, a fixed coupon schedule, and a minimum amount outstanding of \$100 million.

The Bloomberg Barclays US CMBS Investment Grade Index measures the market of conduit and fusion CMBS deals with a minimum current deal size of \$300mn. The index is divided into two subcomponents: the U.S. Aggregate-eligible component, which contains bonds that are ERISA eligible under the underwriter's exemption, and the non-U.S. Aggregate-eligible component, which consists of bonds that are not ERISA eligible.

The Bloomberg Barclays US MBS Index tracks agency mortgage backed pass-through securities (both fixed-rate and hybrid ARM) guaranteed by Ginnie Mae (GNMA), Fannie Mae (FNMA), and Freddie Mac (FHLMC). The index is constructed by grouping individual TBA-deliverable MBS pools into aggregates or generics based on program, coupon and vintage.

The Credit Suisse Leveraged Loan Index is designed to mirror the investable universe of the U.S. denominated leveraged loan market. The index frequency is daily, weekly and monthly. New loans are added to the index on their effective date if they qualify according to the following criteria: 1) Loan facilities must be rated “B” or lower. That is, the highest Moody's/S&P ratings are Baa1/BB+ or Ba1/BBB+. If unrated, the initial spread level must be Libor plus 125 basis points or higher. 2) Only fully funded term loan facilities are included. 3) The tenor must be at least one year. 4) Issuers must be domiciled in developed countries; issuers from developing countries are excluded.

The Standard & Poor's 500, often abbreviated as the S&P 500, or just “the S&P”, is an American stock market index based on the market capitalizations of 500 large companies having common stock listed on the NYSE or NASDAQ. The S&P 500 index components and their weightings are determined by S&P Dow Jones Indices.

The Giliberto-Levy Commercial Mortgage Performance Index measures the investment performance of select private-market investments in commercial real estate debt. Specifically, the Index tracks fixed-rate, fixed-term senior loans that are made by and held in the investment portfolios (“on balance sheet”) of institutional lenders such as life insurance companies and pension funds.

The NCREIF Property Index is a quarterly, unleveraged composite total return for private commercial real estate properties held for investment purposes only. All properties in the NPI have been acquired, at least in part, on behalf of tax-exempt institutional investors and held in a fiduciary environment. Only operating apartment, hotel, industrial, office and retail properties are included in the NPI. An operating property is defined as existing and at least 60% leased. The property can be wholly owned or held in a joint venture structure.

The NCREIF Fund Open-end Diversified Core Index (NFI-ODCE) is a fund-level capitalization weighted, time-weighted return index and includes property investments at ownership share, cash balances and leverage. The index is based on fund net invested capital, which is defined as Beginning Market Value Net Assets (BMV), adjusted for Weighted Cash Flows (WCF) during the period. Performance is reported both gross and net of investment fees.