ALTERNATIVE ASSETS ASSUMPTIONS

A welcome source of alpha, income and diversification

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IN BRIEF

Relative to 2020 estimates, return assumptions for financial strategies are down, driven by expected declines in underlying public markets, but with an improving alpha outlook. Assumptions for real assets (ex-commodities) are flat to up, reflecting the stable income component of core assets and an expected widening of value-added spreads. Our return assumptions are for the median manager; due diligence is key to successful investment.

- **Private equity:** PE return assumptions are lowered, reflecting declining public equity market return expectations. Alpha projections are stable to slightly higher. The disruption and digitalization of the economy, along with changing consumer preferences, should create significant opportunities to put dry powder to productive use.
- **Direct lending:** Direct lending return estimates are trimmed slightly, given expected credit loss increases and challenges from lower cash rates.
- **Hedge funds:** Hedge fund return projections decrease, given a declining public market outlook. Alpha generation should gradually improve as volatility and the dispersion of returns increase while fundamentals gain importance vs. macro factors.
- **Real estate:** Core real estate assumptions rise for the UK, are close to flat for the U.S. and APAC, and are unchanged for Europe ex-UK. Value-added risk premia vs. core increase moving into the new cycle. REITs return projections improve for most regions.
- **Global infrastructure:** Core infrastructure estimates are essentially flat. We expect stable returns, with a high proportion of those returns coming from operating assets with long-dated contractual cash flows.
- **Global transport (NEW):** We see attractive returns for core transport, underpinned, as for other core real assets, by long-term contractual cash flows backed by strong counterparties.
- **Commodities:** Commodity returns are reduced marginally, given lower collateral return expectations and less support from a falling U.S. dollar. **Gold** is expected to maintain its premium vs. overall commodity returns, given anticipated demand from central banks, investors and emerging markets consumers.

J.P.Morgan Asset Management

OVERVIEW

Our expectations for an improving alpha environment and stable income from real assets, along with our risk and correlation assumptions, explain the expanding role we see for alternatives in a diversified multi-asset portfolio, amid a general decline in traditional asset returns.[1] As always, thoughtful allocation and prudent selection of top-tier managers remain critical in realizing the potential for alpha, income and diversification that alternative investing can provide.

EXHIBIT 1: SELECTED ALTERNATIVE ASSETS RETURN ASSUMPTIONS (LEVERED,* NET OF FEES, %)

FINANCIAL ALTERNATIVES	2021	2020
PRIVATE EQUITY (USD)**	7.80	8.80
U.S. private equity - small cap	7.30	8.70
U.S. private equity - mid cap	7.40	8.50
U.S. private equity - large/mega cap	8.00	9.00
PRIVATE DEBT (USD)		
Direct lending	6.80	7.00
HEDGE FUNDS (USD)		
Equity long bias	3.40	4.80
Event-driven	3.10	4.80
Relative value	3.60	4.50
Macro	2.20	3.30
Diversified†	3.30	4.50
Conservative††	3.10	4.00
REAL ASSETS	**2021**	**2020**
REAL ESTATE - DIRECT (LOCAL CURRENCY)		
U.S. core	5.90	5.80
U.S. value-added	8.10	7.70
European ex-UK core	5.00	5.00
European ex-UK value-added	7.70	7.50
UK core	5.90	5.50
UK value-added	8.40	7.70
Asia-Pacific core	6.60	6.50
REITS (LEVERED, LOCAL CURRENCY)		
U.S. REITs	6.50	6.00
European ex-UK REITs	5.90	5.50
UK REITs	6.00	6.00
Asia-Pacific REITs	6.40	6.00
Global REITs	6.40	6.00
GLOBAL INFRASTRUCTURE (USD)		
Core	6.10	6.00
GLOBAL TRANSPORT (USD)		
Core	7.60	N/A
COMMODITIES (USD)	2.30	2.50
Gold	2.90	3.00

Source: J.P. Morgan Asset Management; estimates as of September 30, 2019, and September 30, 2020.
* All return assumptions incorporate leverage, except for Commodities, where it does not apply.
** The private equity composite is AUM-weighted: 65% large cap and mega cap, 25% mid cap and 10% small cap. Capitalization size categories refer to the size of the asset pool, which has a direct correlation to the size of companies acquired, except in the case of mega cap.
† The diversified assumption represents the projected return for multi-strategy hedge funds.
†† The conservative assumption represents the projected return for multi-strategy hedge funds that seek to achieve consistent returns and low overall portfolio volatility by primarily investing in lower volatility strategies such as equity market neutral and fixed income arbitrage.

[1] See Pulkit Sharma et al., "Alternatives: From optional to essential," *2021 Long-Term Capital Market Assumptions*, J.P. Morgan Asset Management, September 2020.

FINANCIAL ALTERNATIVES: AN IMPROVING ENVIRONMENT FOR ALPHA GENERATION AMID A DECLINING OUTLOOK FOR PUBLIC MARKETS – THE UNDERLYING CORE DRIVERS OF RETURN

In the case of private equity, the outlook for alpha is stable to slightly higher, despite the store of dry powder to be deployed. The opportunity set has clearly expanded, with significant dislocations occasioned by digital transformation; the pandemic's impact on the service economy; changing consumer preferences; growing investor interest in corporate environmental, social and governance (ESG) mandates; and the increasing non-U.S. reach for investment returns.

For hedge fund strategies, we see alpha improving toward its long-term historical mean. Our view assumes an investment environment less dominated by macro factors and the significant outperformance of a handful of technology, communication services and e-commerce names. Increased volatility of markets and dispersion of investment returns within and among sectors should increasingly validate the long-short investment models. Macro investing is the exception to the more positive alpha outlook.

The direct lending strategies outlook is anchored more directly to the pandemic and its immediate market impact on starting securities yields and weighted average spreads in a market that remains "starved for yield."

No financial strategies outlook is complete without highlighting the wide dispersion in manager returns around our industry return projections, especially within the private equity space.

PRIVATE EQUITY – DRY POWDER INCREASINGLY FINDING A PROFITABLE HOME

Our private equity (PE) assumptions are lowered relative to last year's. The reduction across the range of fund size and capitalization reflects the decrease in underlying public market return expectations. While we acknowledge the continuing challenge of increasing stores of dry powder and elevated purchase price multiples, our positive alpha expectations are rooted in opportunities created by the disruption and digitalization of the economy, along with changing consumer preferences (**EXHIBIT 2**).

Geographic diversification contributes to the base case return outlook

Private equity assets are increasingly being allocated to non-U.S. markets. We project approximately 50% of the assets of large and mega cap funds will be focused on European and Asian companies (EXHIBIT 2). Importantly, while our public market return expectations are generally lowered, the base (market) returns for Europe and Asia ex-Japan are expected to exceed those in the U.S.

Private equity assumptions decline, driven by expectations for lower public market returns, but the alpha component is stable

EXHIBIT 2: PRIVATE EQUITY ASSUMPTIONS AND RETURN FRAMEWORK

	Small PE (< USD 1bn)	Mid PE (USD 1bn–USD 5bn)	Large/mega PE (>USD 5bn)	Cap-weighted*, **
PUBLIC MARKET EXPOSURES				
U.S. small cap	100%	40%		
U.S. mid cap		50%	50%	
Europe		10%	20%	
Japan			5%	
Asia ex-Japan			25%	
ASSUMPTIONS (USD, %)				
Public market exposure†	4.60	4.70	5.60	5.30
Alpha trend	2.70	2.70	2.40	2.50
2021 LTCMA	**7.30**	**7.40**	**8.00**	**7.80**
2020 LTCMA	8.70	8.50	9.00	8.80

Source: J.P. Morgan Asset Management; estimates as of September 30, 2019, and September 30, 2020.

* The private equity composite is AUM-weighted: 65% large cap and mega cap, 25% mid cap and 10% small cap. Capitalization size categories refer to the size of the asset pool, which has a direct correlation to the size of companies acquired, except in the case of mega cap.

** The regional weights for the capitalization-weighted PE composite are: U.S.: 60%; Europe: 20%; Japan: 5%; Asia ex-Japan: 15%.

† Includes impact of translation into USD.

mid and small cap markets. This is especially relevant for USD-based investors. And regardless of a portfolio company's domicile, global product expansion remains part of the operational value-added mandate for private equity managers.

Disruption creates opportunity

As we have highlighted in the past few years, private markets may offer a better environment than public markets for accessing disruptive innovation. Often, a focus on short-term operating metrics and targets deters public corporations from investing in long-term value creation. The U.S. and economies globally are experiencing a transformation, with old, asset-heavy industries giving way to new, digitally enabled business models. Together with demographic shifts and changing consumer preferences, this points to an expanding opportunity set for financial sponsors. Additionally, the pandemic has created the need to realign many parts of the service economy – particularly travel, entertainment and food services – but the chaos has served to accelerate the necessity of business model change overall.

A positive alpha outlook – just below the long-term trend

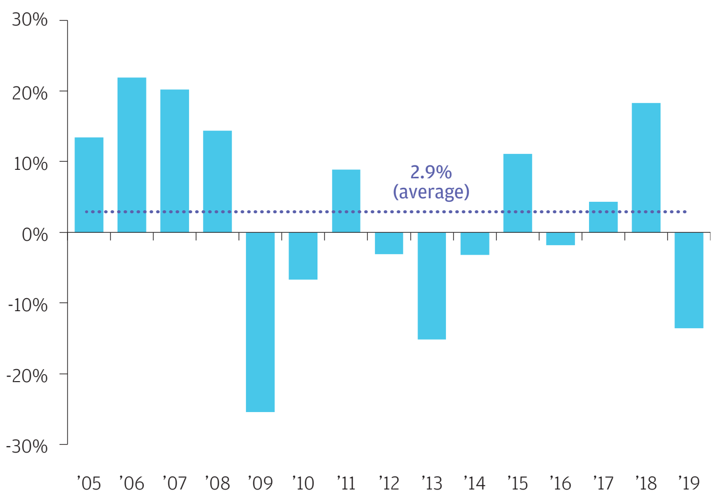
In the context of economic and business model disruption, as well as changing consumer demand, we project dry powder will be more profitably deployed than in the past several years and in rough proximity to the 15-year alpha trend line. In short, our outlook for manager alpha remains positive and largely unchanged from last year, despite the growth in dry powder and elevated purchase price multiples. Our expectation for managers to benefit from disruption and access to higher growth end markets, often more difficult for public market investors to access directly, is the basis for our optimism (**EXHIBITS 3A** and **3B**).

Environmental, social and governance preferences

Of the many trends that have gained momentum over the past financial cycle, one of the strongest – among investors and asset managers alike – is an increasing focus on the management of capital in adherence with ESG principles. The share of the financial sponsor community that has signed the United Nations Principles for Responsible Investment (UNPRI) is on the rise, and the potential to add value is also significant. The ongoing and long-term opportunity of aligning corporate operations with sustainability and governance principles, paired with operational improvements (which remain at the core of the private equity model), will likely add

An expanding opportunity set leaves our long-term alpha assumptions largely unchanged and just slightly below the 15-year alpha trend, despite the growth in dry powder

EXHIBIT 3A: HISTORICAL PREMIUM OF PE TO U.S. MID CAP EQUITY (2005–19)*,**

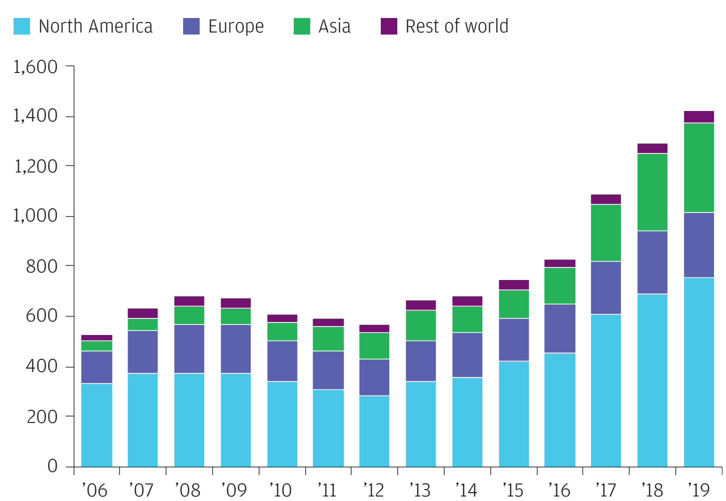


Source: Bloomberg, Burgiss Private iQ, J.P. Morgan Asset Management; data as of June 30, 2020.

* Includes buyout and expansion capital funds.

** The historical premium to U.S. mid cap returns (shown here) is not directly comparable to the forward-looking PE cap-weighted composite alpha trend assumption. Our alpha trend assumption reflects a range of public market exposures (across regions and size categories) in addition to U.S. mid cap, the dominant market exposure.

EXHIBIT 3B: DRY POWDER BY PRIMARY GEOGRAPHIC FOCUS (USD BILLIONS)

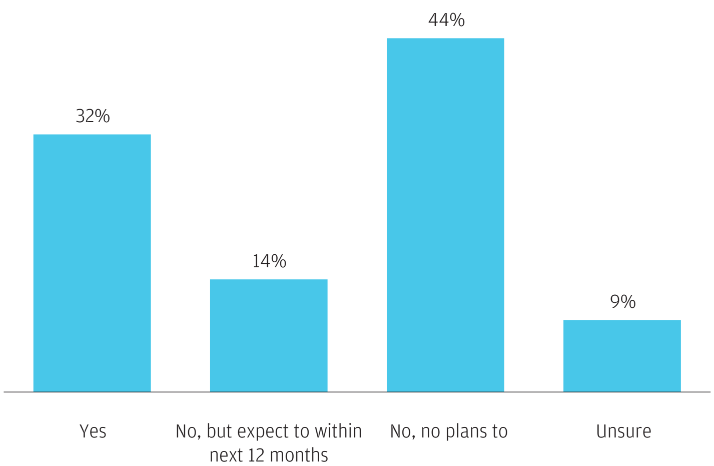


Source: Preqin 2020 Global Private Equity & Venture Capital Report; data as of December 31, 2019.

significant value to an enterprise over time.[2] Currently, ESG and impact investing mandates are a modest but growing part of the total PE asset picture (**EXHIBIT 4**).

ESG principles are of increasing importance to investors

EXHIBIT 4: PRIVATE EQUITY INVESTORS WITH AN ACTIVE ESG POLICY



Source: Preqin Investor Outlook: Alternative Assets H1 2020; data as of November 2019.

Direct or co-investment as an expansion of the private equity experience

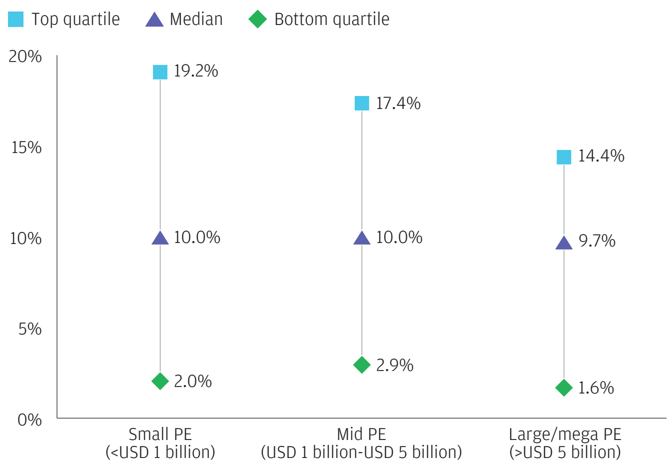
While outside the standard limited partner (LP) return calculation, direct or co-investment options may offer an additional increment to investor returns. Given that many co-investments are offered on a no fee, no carry basis, and others have more attractive investor economics than pooled LP fees, there is the potential for a meaningful return enhancement through fee reduction, assuming all gross investment returns are similar. At this point, return data are scant and manager and investment selection appear to be very important in realizing the potential for this expansion of the private equity experience. Our 2021 projections do not include any increment to return from the projected growth of direct or co-investments.

Manager selection is critical to meeting expected returns

Our positive private equity outlook is premised upon the incremental return opportunities arising from digitalization, changing consumer preferences, business model disruption emanating from the pandemic and the implementation of ESG principles. To capitalize on all these opportunities, operational expertise across markets and industries is critical. That broad range of capabilities is best captured in the dispersion of returns. Manager selection remains essential to achieving the average return outlook or better; the dispersion in performance outcomes continues to be wide (**EXHIBIT 5**) and may potentially expand as the headwinds noted above meet the opportunities best captured by skillful operators.

Manager selection remains critical to realizing the desired benefits of private equity investing

EXHIBIT 5: HISTORICAL RETURNS BY MANAGER PERCENTILE RANKING (IRR, USD)*



Source: Burgiss Private iQ, J.P. Morgan Asset Management; data as of June 30, 2020.
* Includes buyout and expansion capital funds for vintages 2006-19.

[2] For discussion of the potential benefits of incorporating environmental considerations into investment decisions, see Jennifer Wu et al., "Weighing the investment implications of climate change policy," *2021 Long-Term Capital Market Assumptions*, J.P. Morgan Asset Management, November 2020.

DIRECT LENDING – THE DEFAULT CYCLE AND LOWER CASH RATES DIMINISH THE OUTLOOK

Our 2021 estimated levered return for direct lending is 6.80%, a reduction from 2020's assumption of 7.00%, reflecting the headwinds of lower cash rates (as most loans are floating rate) as well as higher overall credit losses as defaults continue to wash through the system. We expect these factors to be partially, though not completely, offset by higher initial spreads and lower financing costs (**EXHIBIT 6**).

How current conditions play out is likely to be a major determinant of future returns for direct lending. Ascertaining the long-term influence of the COVID-19 crisis on the direct lending market is a complex task, given the far-reaching impact of the virus itself and also the diverse nature of private debt borrowers potentially at risk. The effect of central bank purchases is not directly felt here as it is in the larger, liquid debt markets. It is also more difficult to quantify the direct feed-through into loss mitigation from potentially beneficial steps such as the Paycheck Protection Program (established by the CARES Act to support small businesses in meeting their expenses). As elsewhere in the credit market, exposure to sectors positively vs. negatively affected by the virus is a key determinant of portfolio prospects.

Ultimately, as was anticipated in the exuberant days toward the end of the previous cycle, the best factors for minimizing investor losses are likely to be credit selection, careful document structuring and a prudent level of portfolio diversification. While nonaccruals[3] have been on the increase, in general the picture is one of cautious optimism; the gradual reopening of the economy should allow portfolio companies' revenue streams to recover to levels sufficient to service and pay down debt. In addition, private equity sponsors (in many cases, the equity holder subordinated by senior secured direct lenders) are generally supportive of portfolio companies and prepared to inject capital where required. In the immediate term, direct lending deal flow is likely to remain curtailed owing to a decline in middle market mergers and acquisitions. Thereafter, investors may be able to capitalize on a broad increase in available spreads post-crisis.

[3] Nonaccruals are typically defined as unsecured loans with payments 90 days or more overdue.

Return assumptions are reduced, reflecting lower cash rates and higher credit cost estimates

EXHIBIT 6: DIRECT LENDING RETURN ASSUMPTIONS AND BUILDING BLOCKS (USD, %)

	Rate/spread (%)		
	2021	**2020**	
Cash	1.10	1.90	LTCMA for cash
Weighted average spread	5.50	4.90	Based on anticipated leveraged loan spreads, weighted for issuance quality and seniority
Illiquidity	1.00	0.90	Represents "day one" excess returns for direct lenders at origination over and above liquid loans of equivalent credit quality, comprising a mix of upfront fees (amortized over the life of the loan) and excess spread
Starting yield	**7.60**	**7.70**	**Sum of cash rate + spread + illiquidity**
Credit cost	-1.40	-1.25	Assumed defaults, net of assumed recoveries in restructuring scenarios
Unlevered yield	**6.20**	**6.45**	**Sum of starting yield + credit costs**
Leverage	6.20	6.45	Reflects 1x turn of leverage added
Cost of financing	-3.80	-4.05	Based on manager discussions and yield spreads on publicly traded debt backed by mid-market loan portfolios
Fees	-1.80	-1.85	Based on manager discussions of management and performance fees on levered assets
Levered assumption	**6.80**	**7.00**	**Sum of unlevered yield + leverage + cost of financing + fees**

Source: J.P. Morgan Asset Management; estimates as of September 30, 2019, and September 30, 2020.

HEDGE FUNDS – IMPROVING INVESTMENT ENVIRONMENT AND INDUSTRY CHANGE STRENGTHEN THE OUTLOOK VS. PUBLIC MARKETS

Our hedge fund (HF) assumptions are marked lower for 2021 vs. 2020 primarily to reflect the reduced underlying public market assumptions that remain key drivers of our outlook for all hedge fund strategy returns (**EXHIBIT 7**). For perspective, our beta assumptions are reduced by over 0.50 percentage points in the case of diversified hedge funds. We project improved operating conditions for most HF strategy classes in terms of alpha generation. Helped by modest industry changes still evolving below the surface, our hedge fund return outlook – together with the potential for enhanced returns inherent in the return dispersion of the strategy class – indicates there is a role for hedge funds in a diversified multi-asset portfolio.

Revamping the methodology to better capture industry investment dynamics

We have, for the past 16 years, employed a long-only beta approach to summarize the key risks and return generators for the hedge fund industry. For 2021, we employ a more nuanced technique to better capture both sides (long and short) of a typical hedge fund strategy. For example, in modeling the core return drivers for the equity long bias strategy we use the return differential between large cap and small cap equity instead of simply using both absolute numbers. We find that this enhancement provides further insight into the pattern of risk-taking and return generation in hedge funds. In addition, it improves the explanatory power of the core return drivers, strengthening our conviction in the core driver approach (see **METHODOLOGY HIGHLIGHTS**).

Lower beta returns for all strategies, but rising alpha expectations

EXHIBIT 7: HEDGE FUND RETURN ASSUMPTIONS (USD, %)

Strategy	2021	2020
Equity long bias	3.40	4.80
Event-driven	3.10	4.80
Relative value	3.60	4.50
Macro	2.20	3.30
Diversified*	3.30	4.50
Conservative**	3.10	4.00

Source: J.P. Morgan Asset Management; estimates as of September 30, 2019, and September 30, 2020.

* The diversified assumption represents the projected return for multi-strategy hedge funds.

** The conservative assumption represents the projected return for multi-strategy hedge funds that seek to achieve consistent returns and low overall portfolio volatility by primarily investing in lower volatility strategies such as equity market neutral and fixed income arbitrage.

METHODOLOGY HIGHLIGHTS

- Each hedge fund strategy has a pre-selected set of factors (both long-only beta factors and spread factors). All factors are mapped to our Long-Term Capital Market Assumptions.
- Rolling seven-year multi-factor regressions are run on monthly hedge fund strategy index returns.
- An elastic net algorithm (a combination of Lasso and Ridge regressions) is used to estimate factor loadings.*
- Medium- to longer-term average factor loadings, including betas and alphas, are studied to guide forecasts.
- Each hedge fund strategy's forecast is the sum of beta and alpha components.

HEDGE FUND BUILDING BLOCKS (%, USD)

	Equity long bias	Event-driven	Relative value	Macro	Diversified	Conservative
Beta return	2.10	1.80	1.10	1.00	1.90	1.25
Alpha trend line	1.30	1.30	2.50	1.20	1.40	1.85
Return expectation	3.40	3.10	3.60	2.20	3.30	3.10

Source: Bloomberg, HFR, J.P. Morgan Asset Management; data as of September 30, 2020. Components may not add up to totals due to rounding.

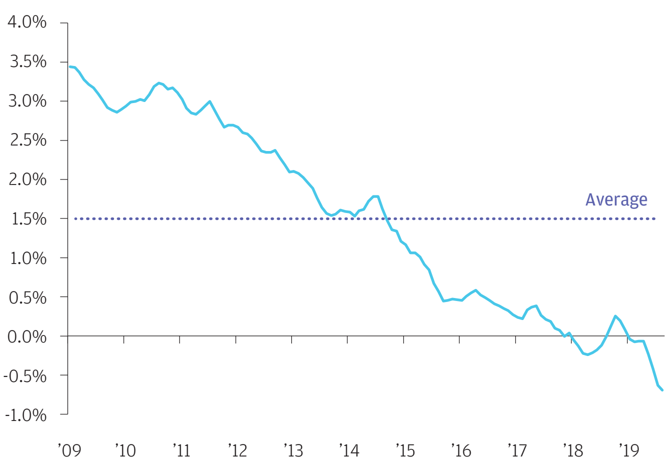
* Lasso and Ridge regression algorithms are in the category of regularized regression, which aims to reduce the numbers of nonzero factor loadings and shrinks the coefficient magnitudes. The benefits include better variable selection and more intuitive results. An elastic net algorithm uses linear combinations of Lasso and Ridge regressions. The methods have been widely used in econometrics and machine learning.

Trend line alpha as seen through a decadelong, post-global financial crisis (GFC) lens

Undeniably, conditions since the GFC have been difficult for most long-short investment strategies to navigate: low sector and individual stock dispersion, low volatility, markets driven in large part by a small cohort of stocks (e.g., FAANGM[4]), and fundamental drivers overridden by macro factors. But in evaluating long-term alpha potential, it is important not to allow the experience of the most recent five years to completely outweigh that of the previous five. In fact, across the entire post-GFC period to date, the average for the long-term alpha trend is positive (**EXHIBIT 8**). While most of the onerous conditions noted are currently still in place, we believe they should normalize over our Long-Term Capital Market Assumptions (LTCMAs) forecast period (10 to 15 years), allowing alpha potential to improve. Examining the historical alpha trend over both halves of the post-GFC period creates a different picture of the alpha potential of the industry – one consistent with our more positive expectations for a modest reversion to the mean long-term alpha estimate.

With a gradual return to operating conditions present in the earlier half of the post-GFC period, the alpha trend could see a modest reversion to its long-term mean

EXHIBIT 8: TREND IN MODEL-ESTIMATED, ANNUALIZED ALPHA FOR DIVERSIFIED HEDGE FUNDS*



Source: J.P. Morgan Asset Management; data as of June 30, 2020.

* The annualized alpha is based on the unexplained residual from a monthly multi-factor regression model (see **METHODOLOGY HIGHLIGHTS**).

Current industry dynamics and the outlook for alpha

We have, over the past two years, highlighted a number of tailwinds to hedge fund returns. Our assumptions continue to reflect these factors as the nature of risk-taking gradually changes to take advantage of ongoing opportunities in the marketplace, which include:

- A tilt toward non-U.S. allocations, especially Asian equity and fixed income markets, given their higher return and inefficiency profiles vs. those of developed markets.
- The ongoing reduction in the industry's standard fees – which continues and, in our opinion, should reach a trough at approximately a 1% management fee. Additionally, a number of management fee-only and performance fee-only standards are developing that could directly contribute to the net return.
- An eventual rise in base policy interest rates, which have historically been a return contributor – a rise that, however, appears unlikely to occur any time soon.
- An increased, albeit still modest (mid-single digit), allocation to hybrid or private investments with potentially private equity-like return profiles.

Two more recently emerging dynamics, as seen by our hedge fund assumptions team, are also likely to have some positive impact on alpha trends: increased sector specialization at one end of the spectrum and the increased resources, capabilities and multi-expertise that come with the mega-size multi-strategy funds at the other end.

In total, while the industry alpha trend line is slanted downward over the last 10-plus years, its average value over this period is still positive and, in the case of relative value strategies, high and fairly consistent. With basic market dynamics likely to improve modestly, shifting toward previous regime conditions, and given the evolving industry forces cited above, the use of trend line alpha with adjustments seems to us a solid base for extrapolating the return outlook for a changing industry. Macro strategies prove the sole exception to our rising alpha expectations. The outlook is not all negative, however, as the makeup of the composite increasingly weights toward discretionary vs. systematic managers and our outlook for interest rates – an important driver of systematic returns – improves (rises) toward the back end of the assumption time frame.

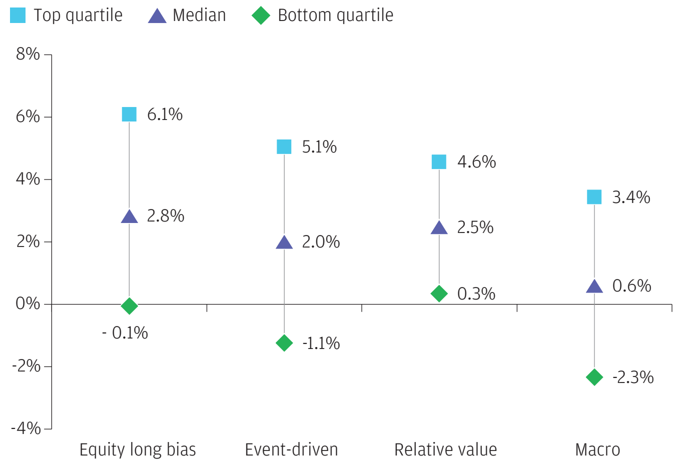
[4] FAANGM refers to Facebook, Amazon, Apple, Netflix, Google's Alphabet and Microsoft.

The industry is changing – the importance of manager selection is not

Whether hedge fund operating conditions resemble those in the earlier or later post-GFC years, the diversity of manager skills and resources across the industry holds, ensuring that due diligence in strategy selection will remain a key element in an investor's ability to fully capture the value of hedge funds in a multi-asset class portfolio (**EXHIBIT 9**).

Manager selection is key to realizing the potential portfolio benefits of a hedge fund allocation

EXHIBIT 9: DISPERSION OF ANNUALIZED MANAGER RETURNS (%), JULY 2015 TO JUNE 2020*



Source: HFR, J.P. Morgan Asset Management; data as of June 30, 2020.
* Returns adjusted for survivorship bias.

REAL ASSETS – STABLE INCOME AND DIVERSIFICATION IN A WORLD OF LOWER YIELDS

The long-term outlook for real assets is attractive, particularly when considered on a risk-adjusted return basis, relative to most traditional assets and financial alternatives. We expect core real assets to continue to gain traction in portfolios, given the stable and diversifying nature of their return streams, driven by income generated from long-term contractual cash flows backed by strong counterparties. We also expect value-added spreads to core, compressed late in the last cycle, to expand in the new cycle and return to a more normal historical relationship over our assumptions time frame.

The pandemic's impact on the real assets space has been limited, overall. The movement of goods, water, energy and data has been only marginally affected. Utilities, logistics, renewables and residential segments have also demonstrated resilience. Sectors experiencing the greatest impact are those that rely on the movement of people, including hospitality, retail and airlines. Within real estate, one result has been a further acceleration of the e-commerce-driven growth of the industrial/logistics sector at the expense of the retail sector.

We see increasing institutional asset flows fueling growth and expanding investment opportunities in a number of areas, including core infrastructure and transport, which are becoming scalable institutional core real asset categories alongside core real estate, and extended asset class sectors – for example, data centers, health care facilities, single-family rentals and storage. Institutions' expanding appetite for investments in real asset markets beyond their own borders should continue to drive growth and diversification of the global real asset opportunity set.

GLOBAL REAL ESTATE – LONG ESTABLISHED ... AND CONTINUOUSLY EVOLVING

Our 2021 assumptions for core real estate rise for the UK, are close to flat for the U.S. and APAC, and are unchanged for Europe ex-UK (**EXHIBIT 10A**). Value-added real estate returns receive an incremental boost vs. 2020 assumptions due to an improved cyclical adjustment (**EXHIBIT 10B**).

Core real estate return assumptions are flat to modestly up

EXHIBIT 10A: CORE REAL ESTATE ASSUMPTIONS AND BUILDING BLOCKS (LOCAL CURRENCY, %)

Core real estate	U.S.	Europe ex-UK	UK	APAC
Starting NOI (before capex) yield	4.70	4.10	5.05	4.05
Maintenance capex	(0.70)	(0.25)	(0.25)	(0.25)
Net cash flow growth	2.60	1.50	1.20	2.80
Exit yield adjustment	(0.50)	(0.45)	(0.10)	(0.75)
Standard industry fees	(0.70)	(0.70)	(0.70)	(0.75)
Unlevered return, net of fees	**5.40**	**4.20**	**5.20**	**5.10**
Leverage impact	0.50	0.80	0.70	1.50
2021 levered return, net of fees	**5.90**	**5.00**	**5.90**	**6.60**
2020 levered return, net of fees	5.80	5.00	5.50	6.50

Improved cyclical dynamics expected to widen value-added spreads to core

EXHIBIT 10B: VALUE-ADDED REAL ESTATE ASSUMPTIONS AND BUILDING BLOCKS (LOCAL CURRENCY, %)

Value-added real estate	U.S.	Europe ex-UK	UK
Core real estate unlevered return, gross of fees	6.10	4.90	5.90
Risk premium	3.00	3.00	3.00
Cyclical adjustment	(0.80)	(0.20)	(0.35)
Standard industry fees	(2.50)	(2.50)	(2.50)
Unlevered return, net of fees	**5.80**	**5.20**	**6.05**
Leverage impact	2.30	2.50	2.35
2021 levered return, net of fees	**8.10**	**7.70**	**8.40**
2020 levered return, net of fees	7.70	7.50	7.70

Source: J.P. Morgan Asset Management; estimates as of September 30, 2019, and September 30, 2020.

U.S. real estate

Our assumption for **U.S. core real estate** rises slightly from last year's. Starting net operating income (NOI) yield is virtually unchanged. In Q4 2019, the U.S. real estate market was trading wider vs. fixed income, had lower vacancy than before the GFC and had modest net investment flows (**EXHIBIT 11**). This year, we estimate that prices have declined less than 10% from their 2019 peak while decreases in net cash flows tied to rent drops, vacancy increases and some rent payment deferrals are depressing income by a roughly equal percentage. While we expect a higher growth rate for net cash flow, given its lower starting point, this impact is likely to be offset by headwinds to rental income in a period of below-potential GDP growth. A lower-for-longer interest rate environment improves the outlook by lowering exit yields and boosting the benefits of modest leverage.

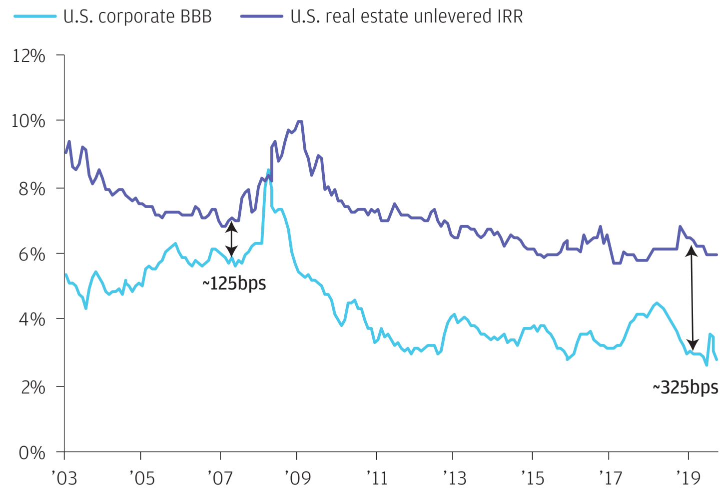
Underlying our core real estate assumption are several sectoral trends. The growth of e-commerce, accelerated by the pandemic, is serving to shrink the retail share of the commercial real estate industry. At the same time, e-commerce is helping to expand the industrial share with opportunities for "last-mile" properties, data centers and warehouses.

In our view, the practice of working from home, accelerated by COVID-19, could have a more modest impact on the office sector than some may believe. While this trend is likely to be disruptive for coworking/flex leasing firms, properties dependent on larger businesses with traditional long-term rental agreements may experience a more evolutionary impact. Additionally, office occupancy growth should benefit as faster-growing infotech tenants replace slower-growing traditional firms. The shift from urban core living to suburban apartments and single-family rentals is another trend we see continuing.

This year, our **U.S. value-added real estate** assumption builds in an increased increment to core returns, based on two factors. Prices for both value-added assets with substantial leasing risk and raw land have been weaker than for core assets, suggesting an opportunity to capture relative value. Additionally, while the spreads on development loans are moderately wide, short-term rates are so low that leverage is highly accretive for value-added executions.

U.S. real estate is better positioned than it was just prior to the GFC

EXHIBIT 11: U.S. CORE UNLEVERED REAL ESTATE PREMIUM OVER BBB: DECEMBER 2007 VS. DECEMBER 2019



Source: Moody's Analytics, NCREIF, J.P. Morgan Asset Management; data as of June 2020.

European real estate

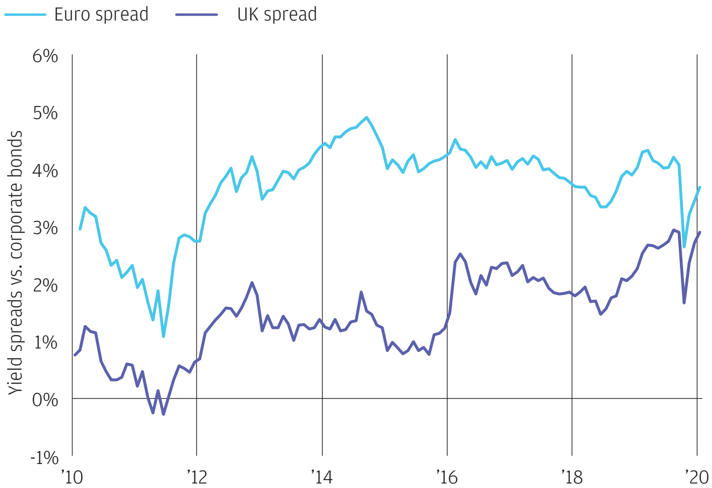
European core real estate return assumptions remain attractive. Premia placed on assets that provide long-term sources of income backed by high quality credit leases have remained close to, and in some cases above, their pre-COVID-19 peak. Although assets with less stable sources of income are expected to suffer some pricing weakness, so far the impact has been limited. The combination of generous spreads over corporate bond yields and substantial fiscal support has protected both capitalization rates and income levels (**EXHIBIT 12**). In addition, relatively limited transaction volumes combined with substantial pent-up investor demand have provided further pricing support.

Looking ahead, key questions center around the robustness of rental values. We expect the pricing of core assets to remain strong, reflecting a lower-for-longer fixed income outlook as well as the attractiveness of contractual income streams offered by long-duration leases. Although our long-term projections reflect net income growth rates that keep pace with inflation, a short-term decline in rental income is likely. Over the forecast period, rents are expected to remain in line with prices, with weakness in the retail sector being offset by a stronger logistics sector. While corporate and government bond yields are expected to rise, real estate pricing at the end of the forecast period should be protected by enhanced rental growth expectations and risk premium mean reversion.

As in the U.S. market, spreads between European value-added and core real estate are likely to increase, suggesting an enhanced case for investing in value-added assets over time.

Real estate spreads over corporate bond rates remain generous

EXHIBIT 12: EURO AND UK REAL ESTATE YIELD SPREADS VS. CORPORATE AGGREGATE BONDS



Source: Bloomberg, Green Street Advisors, J.P. Morgan Asset Management; data as of June 30, 2020.

Asia-Pacific real estate

Our APAC core real estate return assumption is raised slightly from last year and continues to exceed those of the U.S. and Europe. This modest improvement is driven by a slight increase in our estimated starting NOI, which, along with our expectations for a marginally higher exit yield adjustment and a greater impact from leverage, more than offsets our somewhat lower assumption for net cash flow growth.

While transactions have been limited, we do see pricing weakness in the retail and office sectors, primarily reflecting a slowdown in income collections. In contrast, pricing in the industrial sector has been stable, benefiting from greater e-commerce activity and positive demand growth across the region. Although our net cash flow growth assumption is lower than last year's, given the tremendous rental pressures within the retail sector and ongoing rental adjustments in most office markets, it remains at an attractive level. We expect rents to stabilize in 2021 and rental income growth to improve over the longer term, supported by healthy medium- to longer-term economic growth and prevailing structural land shortages in many markets. Those expectations are reflected in our exit yield assumption. In addition, given the low financing costs available, leverage is expected to be accretive to both yields and total return.

We view the COVID-19 crisis as a temporary disruption to the APAC region's otherwise strong economic growth trend. By 2030, APAC is expected to constitute close to 40% of the global economy. We expect its growing economic presence to draw increased allocations to the region's real estate market – a market that should be supported by favorable demographics and increased urbanization as it scales and matures. However, with further institutionalization of the APAC real estate market, increased competition from buyers is likely to reduce risk premia.

REAL ESTATE INVESTMENT TRUSTS (REITS) – FAIRLY PRICED, GLOBALLY

Our global REITs return projection is increased this year, reflecting improved outlooks for U.S., Europe ex-UK and APAC REITs.

Our regional forecasts (**EXHIBIT 13**) are based on unlevered core real estate returns as a starting point, given that REITs are ultimately subject to the same fundamentals as the underlying real estate held within these publicly traded vehicles. The regional core returns are then adjusted for sector composition, REIT leverage by region and pricing relative to underlying real estate valuation.

Across markets, REITs are seeing a more pronounced benefit from leverage this year. Pricing looks roughly fair to slightly cheap relative to the underlying real estate, though these figures are subject to considerable uncertainty amid the COVID-19 pandemic. In the U.S., the relatively fair pricing is an improvement from last year, when REITs valuations were trading at a premium. The U.S. projection also accounts for the higher cash flow growth of extended sectors (e.g., data centers), which is not captured in our core real estate return figures. APAC REITs, also at a premium last year, are now priced at a discount. The significant discount for Europe ex-UK REITs continues from last year. The unchanged UK projection reflects the counteracting effects of an improved private real estate outlook and less discounted underlying starting valuations.

Global REITs return assumptions have increased, but with variations across regions

EXHIBIT 13: REITs RETURN ASSUMPTIONS AND BUILDING BLOCKS (LEVERED, LOCAL CURRENCY, %)

REITs	U.S.	Europe ex-UK	UK	APAC	Global*
Core real estate unlevered return, net of fees	5.40	4.20	5.20	5.10	5.20
Tilt toward higher growth sectors	0.30	0.00	0.00	0.00	0.20
Net leverage benefit	0.70	1.20	0.80	0.90	0.80
Amortization to NAV discount	0.10	0.50	0.00	0.40	0.20
2021 expected return	**6.50**	**5.90**	**6.00**	**6.40**	**6.40**
2020 expected return	6.00	5.50	6.00	6.00	6.00

Source: J.P. Morgan Asset Management; estimates as of September 30, 2019, and September 30, 2020.

* The global composite is built assuming the following weights: roughly 60% U.S., 10% Europe ex-UK, 5% UK and 25% Asia-Pacific.

GLOBAL CORE INFRASTRUCTURE – STABLE RETURNS OVER THE NEXT DECADE

Our 2021 infrastructure long-term return projection is 6.1%, essentially flat vs. 6.0% last year. We expect continued stable returns over the next decade, with a high proportion coming from operating yield.

Return building block considerations

This year, we continue to refine our building block approach to provide a more granular breakdown of the components of our infrastructure return expectations. The fundamental building block of our core infrastructure return assumption is starting operating yield, estimated at 5.00%. Core infrastructure assets typically have long-term contracts, which insulate their income-driven returns from short-term fluctuations in asset values. Given our long-term outlook for normalizing global growth, our cash flow growth assumption rises. We assume maintenance expenses of approximately 65bps per annum. In addition, our return assumption builds in a positive adjustment for a higher valuation impact, reflecting our expectations of increasing investor demand for higher yielding asset classes in a continuing historically low yield environment. Leverage results in a positive 1.2% return impact, reflecting a reduction in the cost of debt rather than a marked increase in loan-to-value ratios (**EXHIBIT 14**).

Core infrastructure returns are up marginally, given slightly higher expected cash flow growth and exit multiples

EXHIBIT 14: GLOBAL CORE INFRASTRUCTURE – RETURN ASSUMPTIONS AND BUILDING BLOCKS (USD, %)

Core infrastructure	2021
Starting yield	5.00
Cash flow growth	1.00
Maintenance	(0.65)
Valuation impact	0.80
Fees and other expenses	(1.25)
Unlevered return, net of fees	**4.90**
Leverage impact	1.20
2021 levered return, net of fees	**6.10**
2020 levered return, net of fees	6.00

Source: J.P. Morgan Asset Management; estimates as of September 30, 2019, and September 30, 2020.

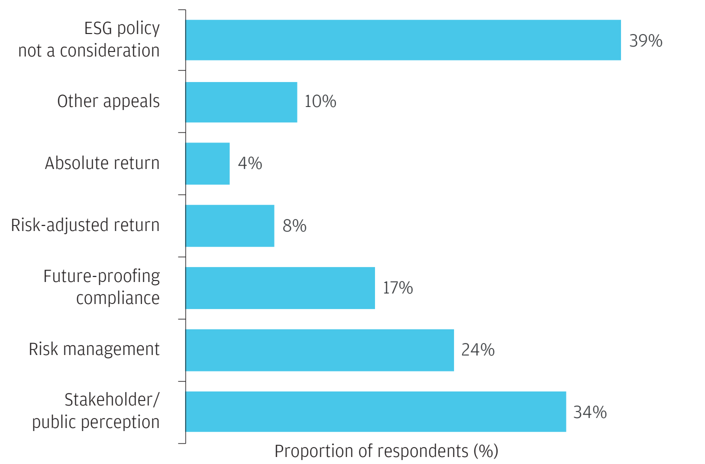
Long-term drivers

We expect a growing need for new capital to fund the development of infrastructure assets. According to estimates from the OECD, between USD 3 trillion and USD 6 trillion in new infrastructure investments will be required annually through 2030 to meet the U.N.'s Sustainable Development Goals.[5] Similarly, investor demand is expected to remain robust, particularly for stable operating assets with long-dated contractual cash flows that can offer portfolio diversification and a less cyclical return profile.

In addition to sustained investor demand, we expect heightened attention to environmental, social and governance standards from asset managers and investors alike. As the social license to operate is a key component of most infrastructure assets, addressing societal impact is an integral part of infrastructure asset management, particularly when viewed over a long-term investment horizon. Infrastructure asset managers have established themselves as leaders in ESG integration, with 40% of managers being signatories to ESG or impact frameworks and many others taking active approaches to incorporating ESG policies.[6] Investors are generally supportive as well, with many viewing ESG policies favorably (**EXHIBIT 15**).

Investors appear to value the potential benefits of adhering to ESG policies

EXHIBIT 15: INVESTORS' VIEW ON BENEFITS OF ESG POLICY



Source: 2020 Preqin Global Infrastructure Report, February 2020.

5 Technical note on estimates of infrastructure investment needs, OECD, July 2020.
6 2020 Preqin Global Infrastructure Report, February 2020.

GLOBAL CORE TRANSPORT – A DIFFERENTIATED SET OF POTENTIAL YIELD ENHANCERS

This year, we add core transport to our real assets assumptions – the third leg of the real assets stool – completing the real estate, infrastructure and transport triad. We project a long-term core transport return of 7.6% (see **EXHIBIT 16** and **BUILDING BLOCKS OF CORE TRANSPORT RETURNS**).

Transportation is an essential asset class closely linked to the global economy and includes several subsectors: maritime vessels, energy logistics assets, aircraft, rail cars and intermodal containers, as well as equipment and vehicle leasing. Each of these subsectors has differentiated return drivers, allowing for the construction of a well-diversified allocation. The role of these assets in the global economy cannot be understated: Maritime vessels transport roughly 95% of global trade,[7] while the aircraft industry carried over 4.3 billion passengers globally in 2018.[8] Furthermore, most of the transportation subsectors experienced a 3%–7% compound annual growth rate in demand over the last 10 years, a trend expected to continue as population and consumption grow (**EXHIBITS 17A** and **17B**). COVID-19 headwinds have increased market participant return requirements for the aircraft and container sectors, but yields are expected to revert to historical levels over the long term.

Most transportation assets have a finite useful life ranging from 25 to 35 years, hence the need for continued capital investment to renew and expand the fleet. Over the next 10 years, the replacement and growth capital needed for the sector is expected to be in excess of USD 4 trillion, with an annual required capital amount of between USD 300 billion and USD 600 billion.[9]

Core transport can be a potential source of enhanced yields

EXHIBIT 16: GLOBAL CORE TRANSPORT – RETURN ASSUMPTIONS (USD, %)

Core transport	2021
Starting yield	9.50
Cash flow growth	0.00
Maintenance	(0.35)
Depreciation	(2.30)
Fees and other expenses	(1.25)
Unlevered return, net of fees	**5.60**
Leverage impact	2.00
Levered return, net of fees	**7.60**

Source: J.P. Morgan Asset Management; estimates as of September 30, 2020.

7 International Chamber of Shipping, United Nations, as of 2019.

8 Aviation benefit report, Industry High Level Group, as of 2019.

9 Clarksons Research, Morten Beyer & Agnew, J.P. Morgan Asset Management Global Real Assets Research; data as of September 30, 2020.

Demand within major transportation sectors should continue to expand as population and consumption grow

EXHIBIT 17A: TOTAL SEABORNE MARITIME AND ENERGY LOGISTICS TRADE

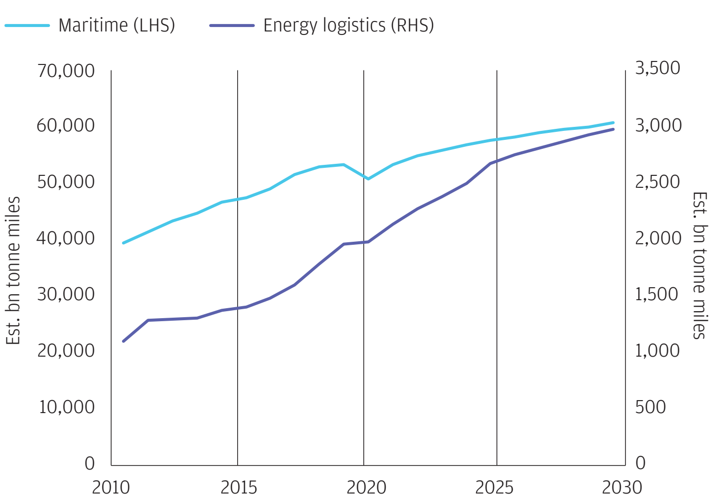
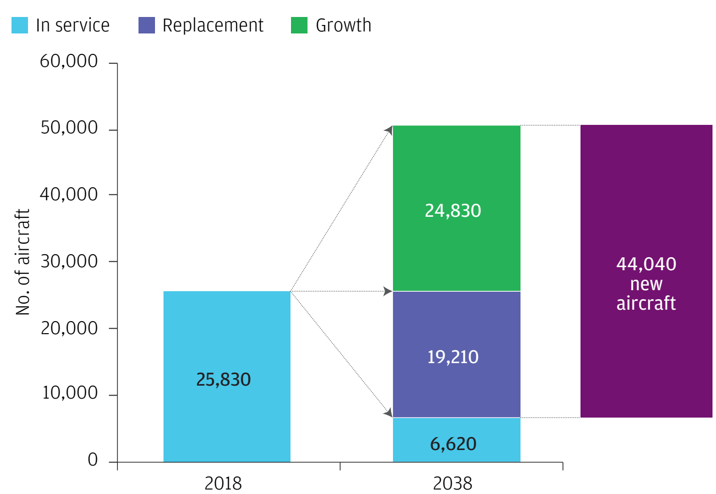


EXHIBIT 17B: TOTAL AIRCRAFT FLEET GROWTH OUTLOOK



Source: Clarksons Research, Morten Beyer & Agnew, J.P. Morgan Asset Management Global Real Assets Research; data as of September 30, 2020.

BUILDING BLOCKS OF CORE TRANSPORT RETURNS

Our long-term return estimates begin with starting yield. Downward adjustments are applied for maintenance and depreciation, and standard fees are deducted. Resulting returns are then adjusted upward for the impact of leverage. More specifically:

- Starting yield is derived from a market-weighted investible portfolio of core transportation assets* and is in line with industry experience over the last 10 years.
- We assume zero cash flow growth, reflecting our expectation of a consistent cost of capital and stable revenue.
- Maintenance of transport assets is lower than for other real assets. Our assumptions reflect maintenance costs of roughly 4% of net operating income.
- Our depreciation assumptions are based on a finite useful life of 25 to 35 years. Value depreciation is expected over the holding period, excluding scrap value.
- Leverage impact is a function of loan-to-value ratios and the cost of debt. We assume a higher debt amortization vs. other real asset segments. Transportation debt spreads have increased, but base rates have fallen, also benefiting the overall cost of debt.

* The market-weighted investible portfolio of core transportation assets consists of approximately two-thirds maritime/energy logistics and one-third aircraft.

COMMODITIES – A FALLING U.S. DOLLAR AND EARLY-CYCLE SUPPLY CONSTRAINTS DRIVE THE OUTLOOK

Our long-term broad-basket commodity assumption is reduced marginally vs. last year's, primarily due to our expectations for lower collateral returns (down 80bps year-over-year) and a reduction in the positive impact on returns from a falling U.S. dollar. Helping to offset this downward pressure is a tighter supply dynamic, consistent with early-cycle conditions and supportive of overall commodity returns (**EXHIBIT 18**).

Our Commodity Event Index (**EXHIBIT 19**) is showing levels of supply constraint indicative of the potential for a moderate cyclical uptick, driven primarily by capex restraint in the oil sector and, more recently, COVID-19-induced production constraints across much of the commodity space. Adding to tighter supply conditions, gold producers are exhibiting greater financial discipline, likely the fallout from companies struggling between 2012 and 2015 as gold prices fell dramatically.

The emerging market (EM) consumption adjustment is slightly reduced to reflect lower per capita commodity consumption for China as it transitions from a more manufacturing-driven to a more domestic consumption-led economy. We also adjust our fee expectations downward, in line with the general industry trend of declining management fees.

Over the last few years, companies and consumers have dramatically shifted their attitude toward nonrenewable energy. A number of leading companies have announced plans to significantly reduce their carbon footprints, while we are seeing global energy producers planning to shift their businesses toward the renewable future. We believe these factors will have a marginal impact over the next 10- to 15-year time frame, which is the projection period for our LTCMAs. When starting from a low base, even double-digit growth in alternative power will not materially change the trajectory of carbon demand for a number of years. Additionally, emerging market economies with higher growth profiles are not likely to limit themselves to green energy sources in meeting their expanding energy needs. Global accords and national energy policies will likely serve to accelerate renewable energy adoption and are potential risks to our expectations.

Gold

Gold returns are modeled by beginning with our base broad commodity return assumption – of which gold is approximately 17% of the overall index – and adding an incremental 60bps premium. This reflects our increasingly positive view on a number of underlying gold price drivers: the continuation of central bank reserve additions, growing demand from China and India (the two largest gold-consuming countries) and negative real interest rates over the short term, as well as interest from institutional investors seeking downside protection outside of fixed income markets, given the risks attributed to a number of economic, monetary and geopolitical issues.

Our commodity assumption, net of fees, remains marginally positive vs. our U.S. inflation expectations (at 2.0%)

EXHIBIT 18: COMMODITIES – RETURN ASSUMPTIONS AND BUILDING BLOCKS (USD, %)

	2021	2020
Collateral return*	1.10	1.90
Position in current cycle (+premium/-discount)	0.60	-0.25
EM per capita consumption adjustment	0.15	0.25
Trade-weighted USD decline impact (projected incremental annual decline vs. historical base period)	1.00	1.35
Total return, gross of fees	**2.85**	**3.25**
Fees	-0.55	-0.75
Total return, net of fees**	**2.30**	**2.50**
Gold return, net of fees	**2.90**	**3.00**

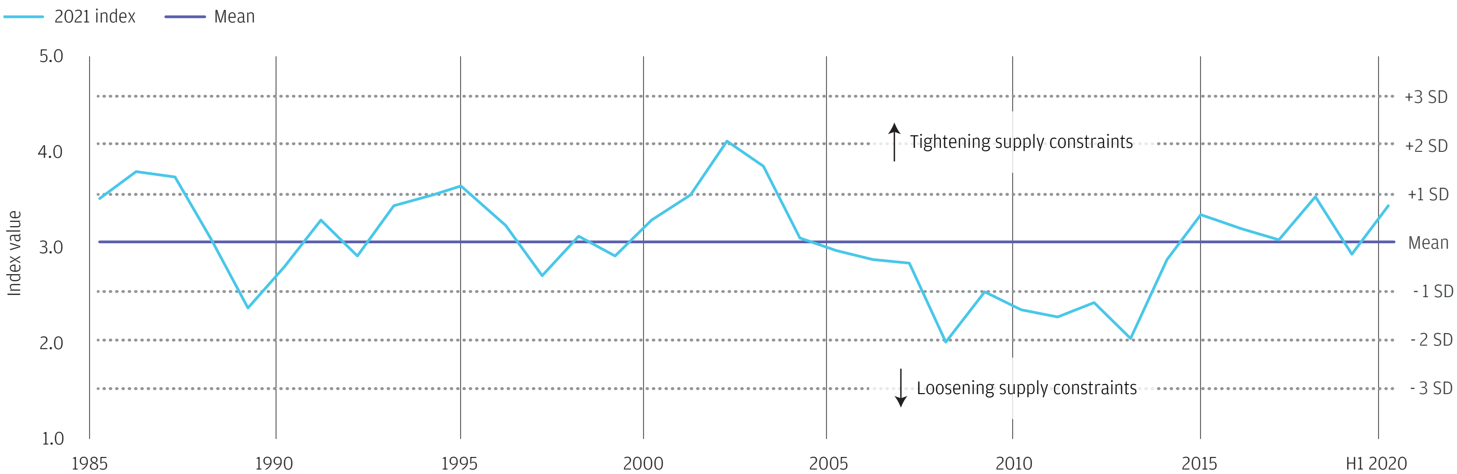
Source: J.P. Morgan Asset Management; estimates as of September 30, 2019, and September 30, 2020.

* The Long-Term Capital Market Assumption for U.S. cash in the specified year.

** Assumes the impact of roll yield will net to zero over the life of the assumptions.

Our Commodity Event Index attempts to capture producers' supply constraints and sentiment

EXHIBIT 19: THE COMMODITY EVENT INDEX*



Source: Baker Hughes, Bloomberg, FactSet, U.S. Bureau of Economic Analysis, J.P. Morgan Asset Management; data as of June 30, 2020.

* Index components include credit ratings (11.1%); age of capital stock (11.1%); financial leverage (11.1%); volume of bankruptcies, takeovers, debt-for-equity swaps (11.1%); capital expenditure to sales (18.5%); oil rig count (18.5%); and CEO turnover (18.5%). Components may not sum to 100% due to rounding.

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