



Hamilton Lane

A  
TALE  
of  
**REAL**  
ASSETS

TODAY'S REAL ASSETS MARKET  
AS EXPLAINED BY CHARLES DICKENS

Real Assets Market Overview 2019

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*“It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness, it was the spring of hope, it was the winter of despair – in short, the period was so far like the present period, that some of its noisiest authorities insisted on its being received, for good or for evil, in the superlative degree of comparison only.”*

- A Tale of Two Cities  
Charles Dickens

It's difficult to classify various complex markets in the superlative state of either “best” or “worst,” but you get the point. Charles Dickens’ 1859 historical novel, *A Tale of Two Cities*, tells a story of the time leading up to the French revolution, addressing numerous complex themes through the callous dichotomy of the “best” and the “worst” or the “haves” and the “have nots.” The various sub-sectors of real assets today could be similarly classified: Some benefit from strong institutional demand buoyed by supportive long-term macro trends, while others are capital starved and battered by headwinds wrought by commodity cycles, technological disruptions and/or political interference.

Both the privileged and the disadvantaged exist across and within the various sub-sectors of the industry as well. Take real estate, for example. While, in aggregate, real estate has enjoyed remarkable stability through this cycle, the continued rise of e-commerce has fueled demand for industrial assets while punishing owners of retail property. Energy is no different. Energy investments on the whole have struggled as a result of weak commodity prices over the last several years; yet, upstream and midstream assets located in certain prime basins, namely the Permian, were still in high demand among market participants in 2018.

The “spring of hope” and the “winter of despair” certainly extends to today’s fundraising environment, which has seen a concentration of larger capital commitments into fewer and fewer investment relationships. Institutions are refocusing their portfolios into core relationships that have delivered for them through multiple cycles. As a result, the big have gotten bigger and the remaining groups soliciting capital are consigned to squabble over the remaining – limited – capital.

Don't misunderstand us as saying we view this relationship concentration as a negative. In fact, in many ways we think it reflects the strong investment performance and organizational strength of these larger firms and was a necessary shift. The last 10-15 years have seen a proliferation of real estate, natural resources (primarily energy) and infrastructure strategies that failed to meet investor expectations, particularly through down-market cycles. Consequently, the real asset landscape is littered with once-dominant firms that can no longer attract new capital and have made a certain rationalization and refocusing of the investment landscape necessary. With that said, much of this is natural market dynamics playing out in the culling of weak participants and the introduction of others who may demonstrate new, unique and defensible strategies.

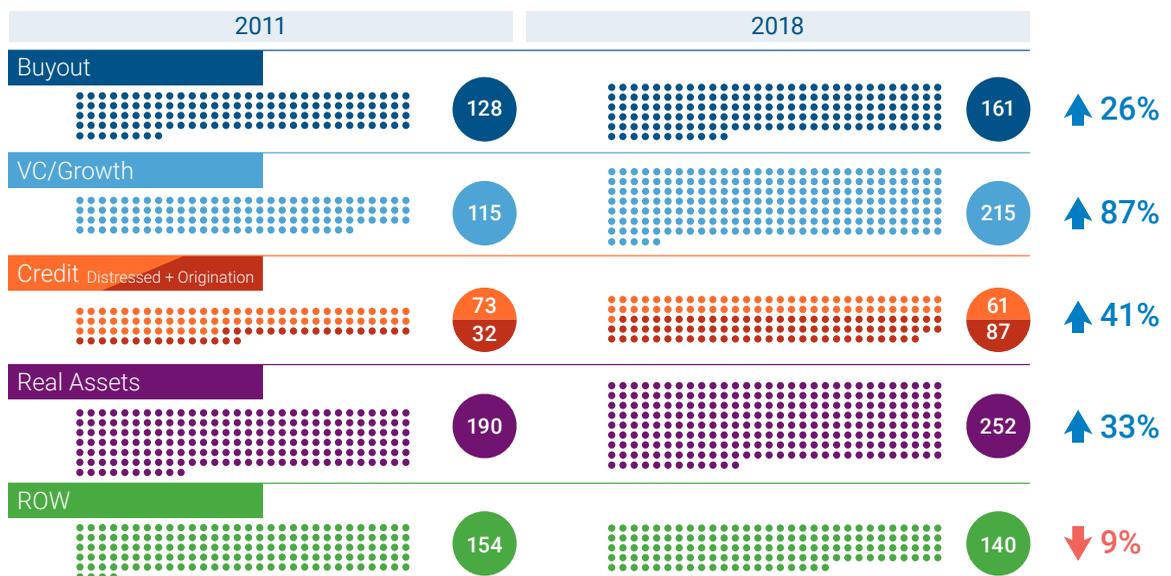
With this backdrop in mind, we will attempt, through “superlative comparison,” to review the global real asset market, highlighting the best of, the worst of, the wisdom, the.... oh, never mind, you see where we're going.

# Market Growth

## The Season of Fundraising, the Spring of Hope

Institutional interest in real assets has grown considerably over the last several years. Since 2011, the number of real asset-related PPMs received by Hamilton Lane increased by almost 40% (Chart 1). Over the same time frame, real assets has grown to represent approximately a quarter of the exposure of the nearly \$5 trillion private market industry (Chart 2). In a previous piece, we illustrated the compelling portfolio construction reasons to include real assets, and we believe the investment characteristics have continued to contribute to this growth.

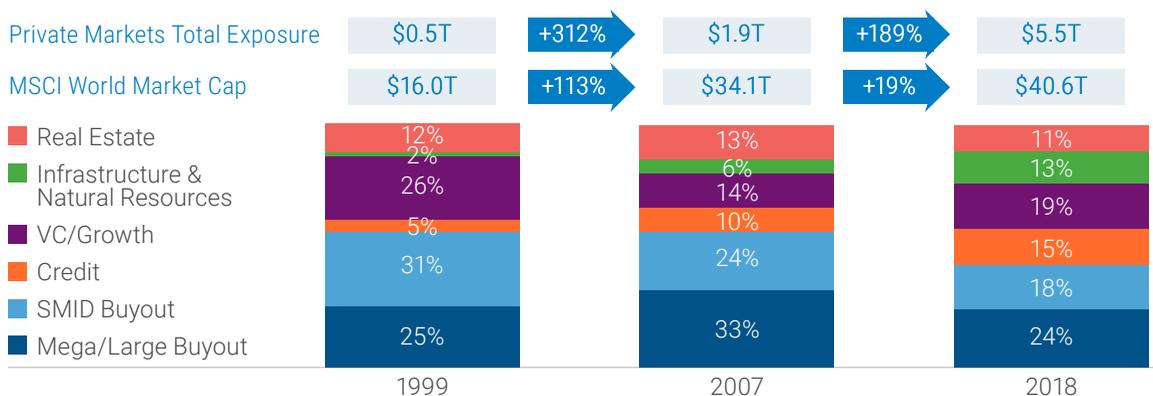
**Chart 1: PPMs Received by Hamilton Lane**



Source: Hamilton Lane Diligence (May 2019)

**Chart 2: Total Exposure by Strategy**

% of NAV + Unfunded



Note: Total exposure and market cap as of year end for 1999, 2007, and 2018.

Source: Hamilton Lane Data (May 2019)

# Fundraising

## The Haves and Have Nots

Real asset fundraising remained strong in 2018 and was on track to outpace the previous high watermark set in 2015 (Chart 3). However, the aggregate numbers mask some of the underlying sub-sector challenges. For example, infrastructure fundraising has been incredibly strong, as that sector continues to gain traction as a mainstay in institutional portfolios. Fundraising in natural resources, on the other hand, has struggled, with institutions growing wary of energy investments in light of a double-dip downturn in commodity prices that has hampered returns and significantly lowered distributions (Chart 4).

**Chart 3: Closed-end Fund Raising by Strategy**  
USD in Billions



Source: Bison Data via Cobalt,, Bain, Preqin, Hamilton Lane estimates (December 31, 2018)

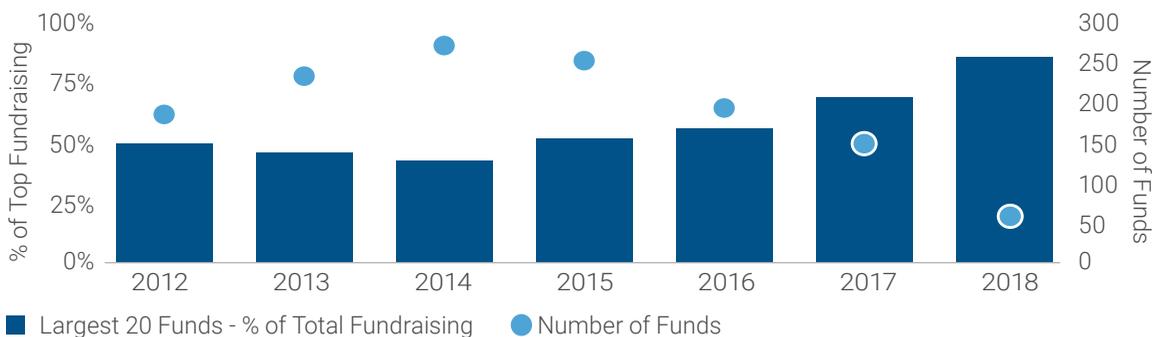
**Chart 4: Closed-end Funds Currently in Market**  
USD in Billions



Note: Includes funds in market as of December 2018  
Source: Bison data via Cobalt, Bain, Preqin, Hamilton Lane estimates

One underlying facet of the current market masked by the aggregate fundraising stats is the concentration of the “haves” vs. the “have nots.” Chart 5 highlights this phenomenon.

**Chart 5: Real Asset Fundraising by Vintage Year**



Source: Bison data via Cobalt as of 9/30/18

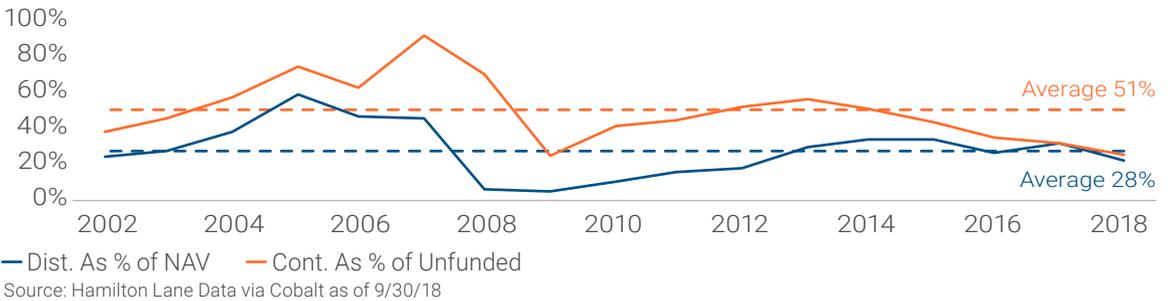
As you can see, capital raised is increasingly concentrated in a smaller number of general partners.

# Distribution & Liquidity

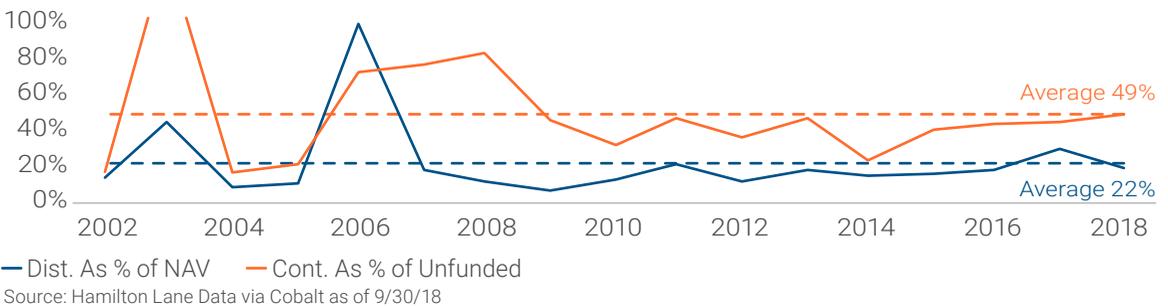
## Another Narrative of Superlatives

One of the reasons investors include real assets in a portfolio is the recurring cash flow distributions. After a period of lower distributions following the Global Financial Crisis, both real estate and infrastructure have returned to historical norms. On average, real estate has distributed roughly 28% of NAV over the last 15 years, while infrastructure distributions have been slightly lower, at 22% (Charts 6, 7 and 8). Given the longer-dated nature of the holding periods for infrastructure assets, though, that's not surprising. Natural resources, on the other hand, have remained below long-term distribution averages for the last several years, and 2018 was no different. Weak commodity and capital markets across the energy complex have made energy distributions essentially non-existent. In addition, timber and agriculture investments have suffered from lower current income and realization activity.

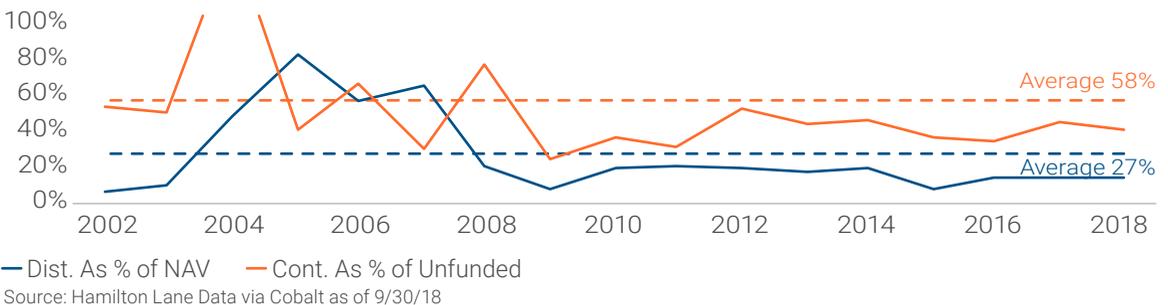
**Chart 6: Real Estate Distributions as a % of NAV and Contributions as a % of Unfunded**



**Chart 7: Infrastructure Distributions as a % of NAV and Contributions as a % of Unfunded**

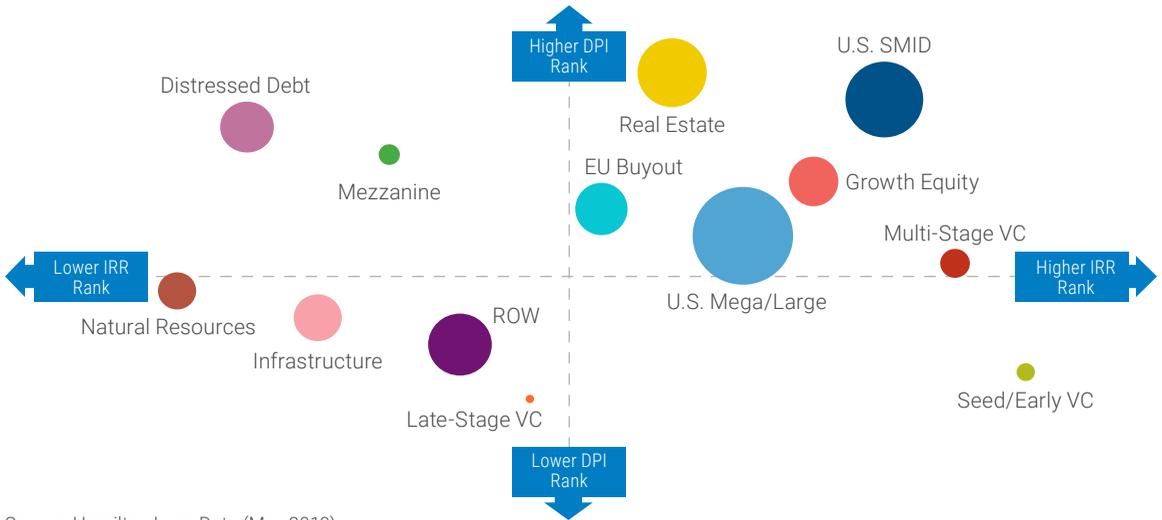


**Chart 8: Natural Resources Distributions as a % of NAV and Contributions as a % of Unfunded**



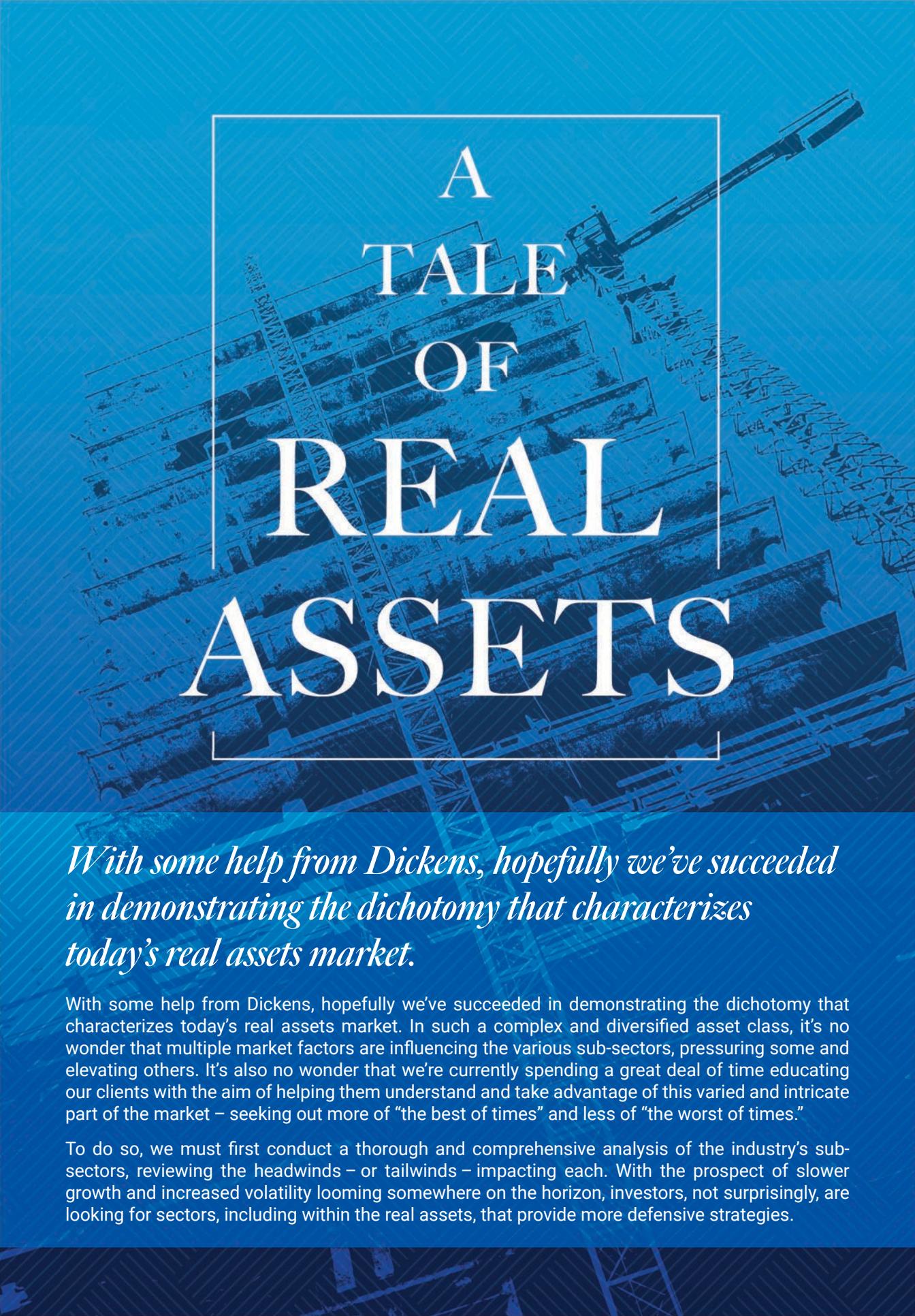
Finally, turning to distributions, although they are important across all asset classes, they are crucial for real asset sub-sectors, since the prospect of current income is often a primary driver for real asset portfolio inclusion. Chart 9 highlights the IRR and DPI ranks across various private market asset classes. Hovering at the bottom left, natural resources is indicating both a low IRR and low distribution rate relative to other areas of private markets. Real estate ranks about as expected with middle-of-the-road IRRs but high distributed capital. Infrastructure, while still nascent as an asset class, also ranks lower on the DPI scale than what would be expected.

**Chart 9: IRR Rank vs. DPI Rank**  
Average 2007–2016, Bubbles Sized by NAV



Source: Hamilton Lane Data (May 2019)

The implications for the low IRR and low DPI stigma on natural resources are real; performance has underwhelmed, and raising new capital in the space, even for established firms, has grown more difficult.



# A TALE OF REAL ASSETS

*With some help from Dickens, hopefully we've succeeded in demonstrating the dichotomy that characterizes today's real assets market.*

With some help from Dickens, hopefully we've succeeded in demonstrating the dichotomy that characterizes today's real assets market. In such a complex and diversified asset class, it's no wonder that multiple market factors are influencing the various sub-sectors, pressuring some and elevating others. It's also no wonder that we're currently spending a great deal of time educating our clients with the aim of helping them understand and take advantage of this varied and intricate part of the market – seeking out more of “the best of times” and less of “the worst of times.”

To do so, we must first conduct a thorough and comprehensive analysis of the industry's sub-sectors, reviewing the headwinds – or tailwinds – impacting each. With the prospect of slower growth and increased volatility looming somewhere on the horizon, investors, not surprisingly, are looking for sectors, including within the real assets, that provide more defensive strategies.

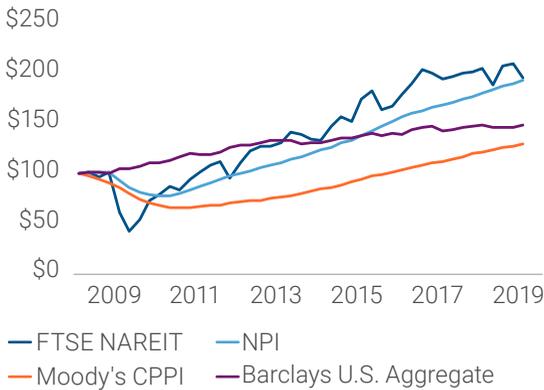
# Real Assets Sub-Sectors

## The Best of Times & The Worst of Times

### Real Estate

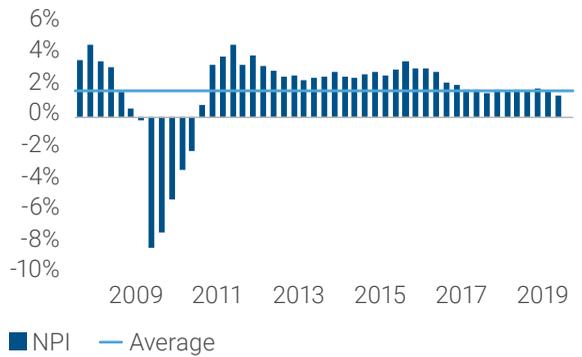
Overall, we think real estate looks to be experiencing the “best of times.” The valuations reflected in the NCREIF, Moody’s and NAREIT indices remain significantly above the prior peaks set immediately preceding the GFC (Chart 10). Perhaps even more telling, year-end 2018 marked nearly 40 consecutive quarters of positive property-level appreciation (Chart 11).

**Chart 10: 10-Year Trailing Performance**



Source: Bloomberg. As of 12/31/18

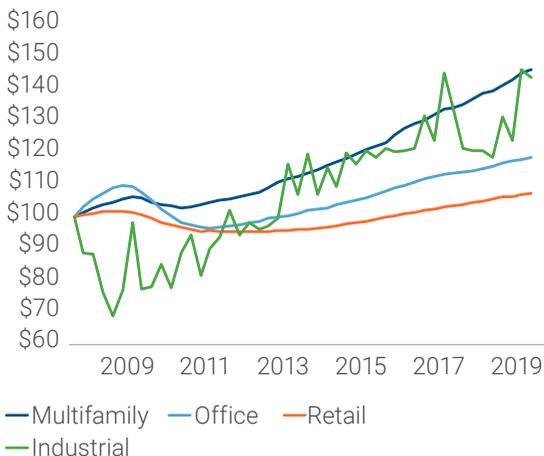
**Chart 11: NPI Return Quarterly Total**



Source: National Council of Real Estate Investment Fiduciaries. As of 12/31/18

However, looking at specific property type fundamentals tells a slightly more nuanced story of “hope” and “despair.”

**Chart 12: Effective Rent Growth**



Source: Bloomberg. As of 12/31/18

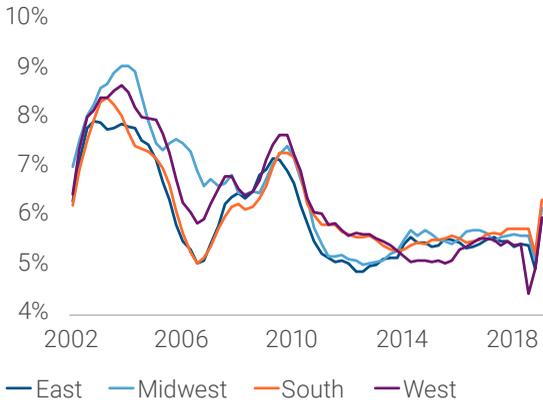
**Chart 13: Cap Rate by Property Type**



Source: Bloomberg. As of 12/31/18

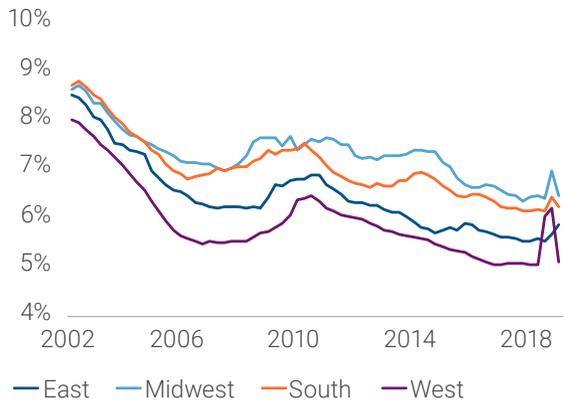
We'll focus our comments on the historical standout performers of multifamily and industrial, while addressing some of the themes impacting retail as well.

**Chart 14: U.S. Multifamily Vacancy Rates**



Source: Bloomberg. As of 12/31/18

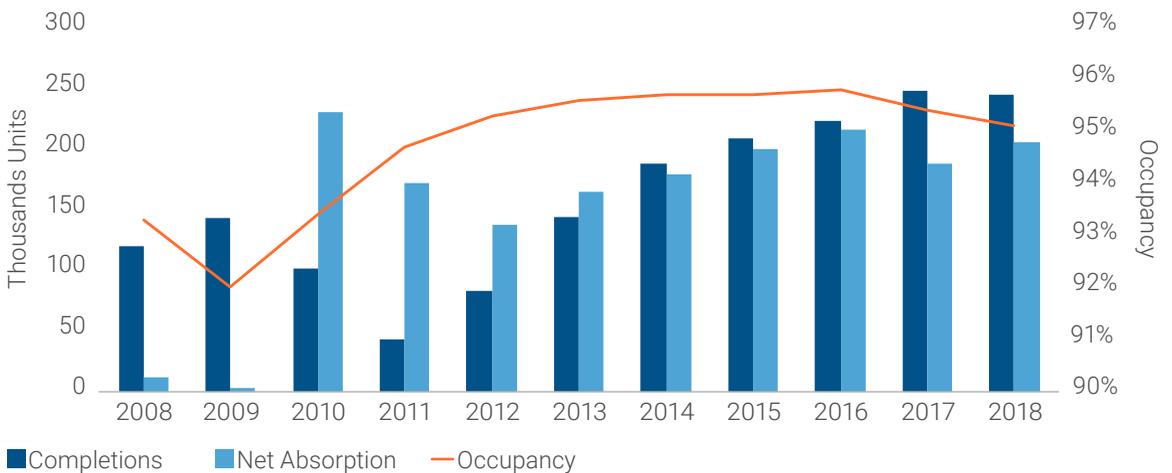
**Chart 15: U.S. Multifamily Cap Rates**



Source: Bloomberg. As of 12/31/18

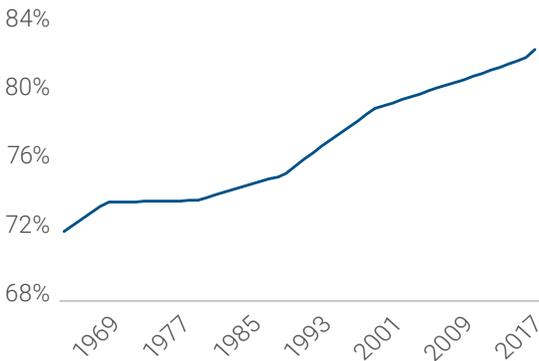
Multifamily has been one of the strongest performing property types since the GFC (Chart 12), buoyed by a growing renter population and, at least until recently, limited new supply. The supply dynamic has begun to change, particularly in Class A multifamily. In recent years, completions have significantly outpaced net absorption and occupancy rates have started to decline, although they remain close to 95% (Chart 16).

**Chart 16: Multifamily**

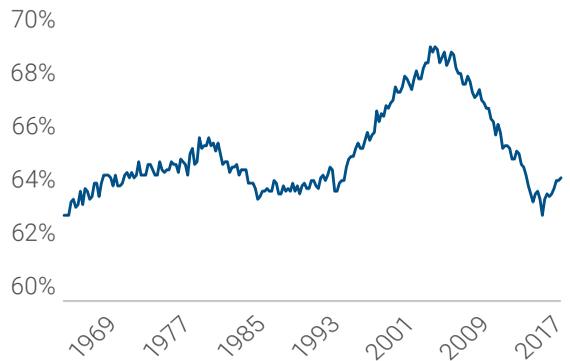


Source: Bloomberg. As of 12/31/18

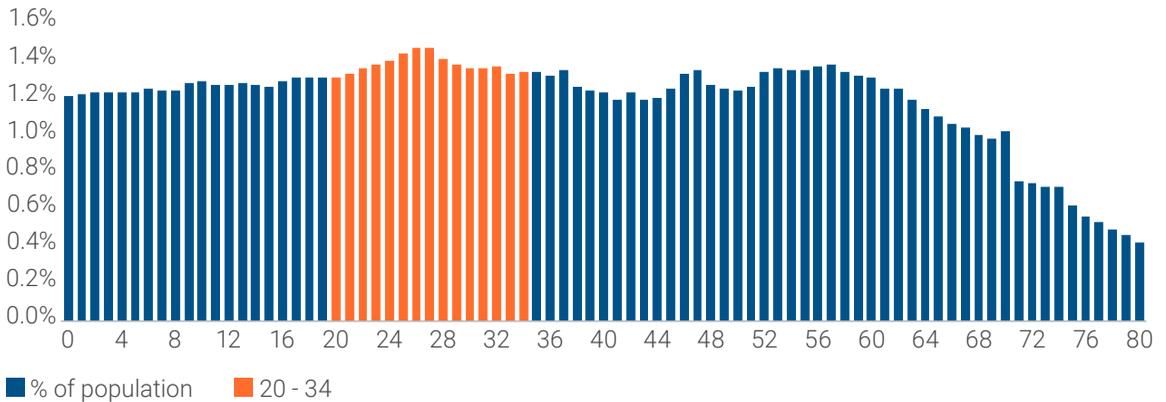
Among the questions we're frequently asked is whether the strength in multifamily can continue or if investors should consider getting out of multifamily altogether. The answer is more nuanced than a simple yes or no. The strength of U.S. multifamily properties has benefitted from long-term, structural shifts happening in the renter population that we do not anticipate going away anytime soon.

**Chart 17: U.S. Urbanization**

Source: United Nations Population Division. World Urbanization Prospects: 2018 Revision. As of 12/31/18

**Chart 18: U.S. Homeownership Rate**

Source: FRED. As of 4/31/18

**Chart 19: U.S. Population by Age**

Source: U.S. Census. Data through 2017

A number of major demographic trends exist that are helping multifamily.

1. The increase in urbanization. This phenomenon is not unique to the United States; throughout the world, cities are growing larger as populations concentrate around major commerce centers. The trend toward urbanization should continue to support strong multifamily demand.
2. The significantly lower rates of home ownership. Over the long-term, U.S. home ownership has hovered around 62-63%. During the housing bubble, this rate spiked to 69% (Chart 18), fueled by cheap and easy credit, along with a strong penchant to speculate on future property values. Since the bust of the housing bubble though, ownership rates have come in line with long-term norms, while access to credit remains more stringent and borrowing costs are higher.
3. The peaking age cohort of the renter population. Housing trends among this age cohort of 20-34 year-olds appear to favor long-term renting over home ownership (Chart 19).

In short, multifamily may remain broadly resistant and may continue to provide attractive investment opportunities, despite pockets of oversupply in certain gateway cities and high pricing environments. One opportunity we see in multifamily is that prospective returns may be better in the Class-B sector, which has demonstrated limited supply growth since the Great Financial Crisis, and where a persistent spread between Class-A and Class-B rents has remained over the long-term.

**Chart 20: Supply: Class A**



Source: REIS. Data through December 31, 2018.

**Chart 21: Supply: Class B/C**



Source: REIS. Data through December 31, 2018.

Whereas Class A multifamily represents newer product with high-end finishes, Class B/C multifamily is comprised of older product with dated finishes and limited amenities. You can see that the new supply dynamics in Class B/C, which by definition already exist, have been muted for the last 15 years: Nobody is building new, “old” apartments. This limited supply dynamic makes Class B/C interesting since these older properties often can be acquired at a discount to Class A and are typically located in prime rental areas with high barriers to entry given when they were built. Further, the renter dynamics in Class B/C are also supportive, as an affordability crisis exacerbated by limited single-family residential supply growth, record pricing, rising labor and construction costs and muted wage growth should continue to drive demand for rental units. This particularly applies to the Class-B category, which serves the largest proportion of the U.S. population.

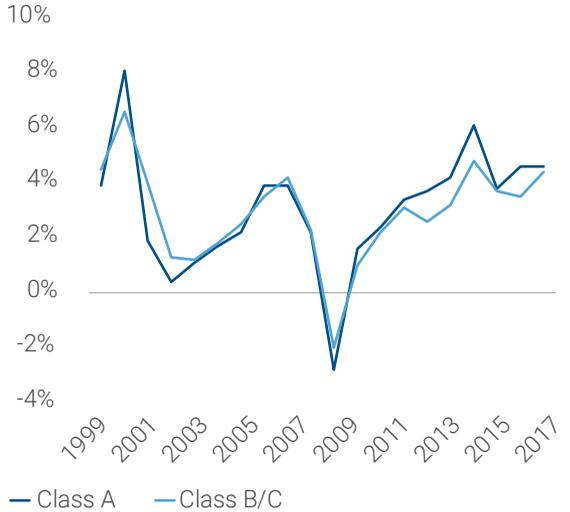
These dynamics have definitely shown up in the vacancy and rental changes in Class B/C properties, even relative to Class A. As demonstrated in Charts 22 and 23 below, vacancy rates in Class B/C properties are 2-3% lower than in Class A, while Class B/C has experienced nearly identical rental growth to Class A.

**Chart 22: Vacancy: Class A vs. B/C**



Source: REIS. Data through December 31, 2018.

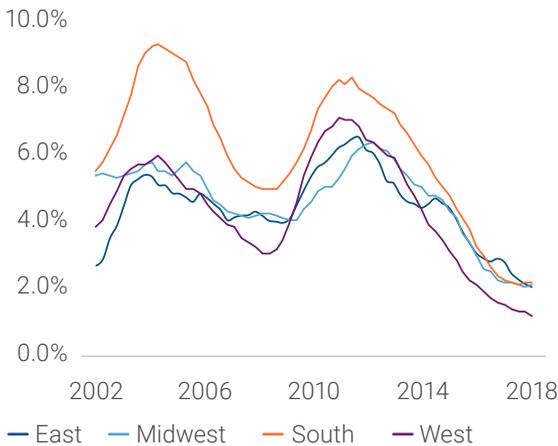
**Chart 23: Annual Rent Change: Class A vs. B/C**



Source: REIS. Data through December 31, 2018.

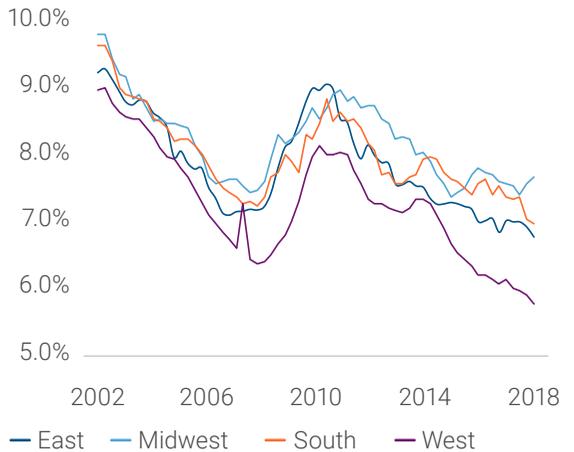
Industrial property seems to be experiencing a “best (or at least better) of times” market....

**Chart 24: U.S. Industrial Vacancy Rates**

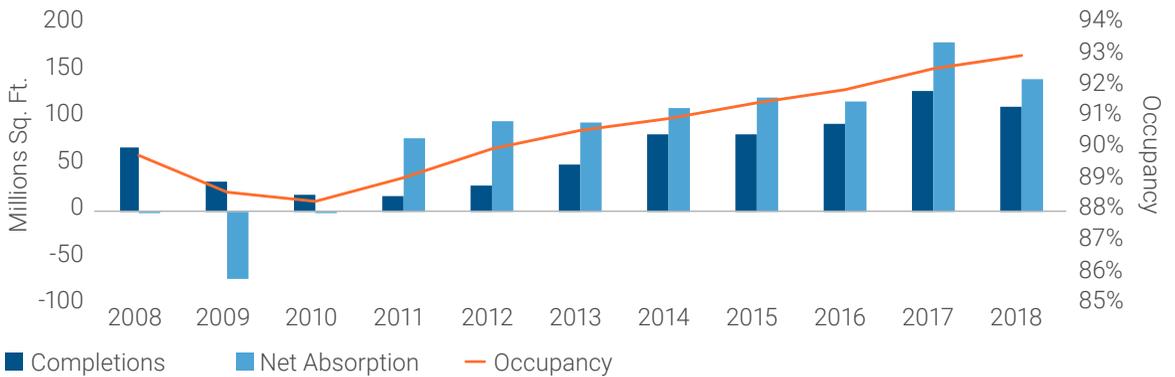


Actual through 12/31/17 estimates after  
Source: Real Capital Analytics (November 2018)

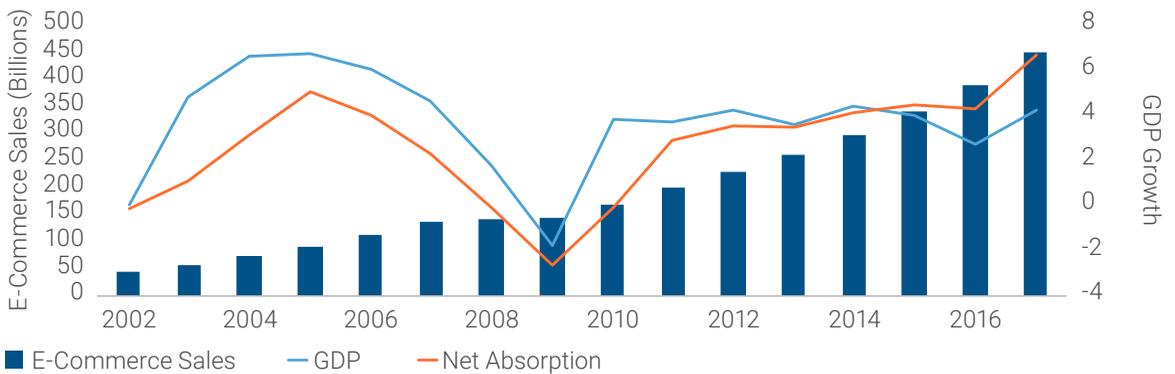
**Chart 25: U.S. Industrial Cap Rates**



Actual through 12/31/17 estimates after  
Source: Real Capital Analytics (November 2018)

**Chart 26: Industrial**

Source: Bloomberg. As of 12/31/18

**Chart 27: U.S. Warehouse Demand vs. GDP, E-Commerce**

Source: Bloomberg. As of 12/31/18

Several factors – changing consumer preferences and behaviors, including the rise of e-commerce and the demand for same-day delivery, and the resulting upheaval of global supply chains – are driving significant investor interest in the industrial sector on a global basis. Despite substantial supply growth during this economic expansion, demand has far outstripped supply leading to declines in vacancy and cap rates with some markets experiencing vacancy rates below 2% (Charts 24 and 25). The surge in e-commerce has facilitated the need for distribution centers in last-mile locations, which are those in close proximity to areas with high population density. Pricing has generally been less competitive for smaller, single-asset transactions, creating an opportunity for select GPs to realize significant premiums through exiting aggregated portfolios to core buyers.

Consistent with our theme, if e-commerce has been a boon to industrial, it's been a bane to retail. While retail may not be experiencing the “worst of times,” it has definitely seen better days. Retail occupancy and rental rates have fallen, and retail was the worst-performing property type in the NCREIF Property Index (“NPI”) in 2018. Despite this, over the long-term, retail has been one of the strongest-performing property types with the high risk-adjusted returns in the NPI index.

**Chart 28: Periodic Table of Returns**

Trailing Total Return Performance						Risk Metrics		Count of Periodic Ranking Since Inception					
2018	3 Years	5 Years	10 Years	20 Years	SI Return	SI Std. Dev.	SI Sharpe Ratio	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6
14.30%	13.23%	13.59%	8.30%	10.54%	10.61%	9.50%	75.13%	15	14	16	13	16	19
7.57%	7.22%	9.36%	7.37%	10.41%	10.15%	9.32%	66.45%	10	8	8	10	8	8
6.85%	6.52%	9.06%	6.58%	9.63%	9.74%	7.58%	56.35%	6	8	8	7	5	6
6.72%	6.36%	8.62%	6.58%	9.45%	9.43%	7.38%	55.32%	6	4	3	4	4	3
6.07%	5.74%	8.37%	5.59%	9.20%	8.83%	7.36%	39.33%	3	4	3	4	4	0
2.18%	5.63%	8.29%	4.40%	7.88%	7.75%	6.49%	39.21%	2	2	2	2	3	0

■ Retail ■ NPI ■ Office ■ Industrials ■ Apartments ■ Hotels

Source: NCREIF Property Index (March 2019). For illustrative purposes only. Actual results may vary.

Sure, the notion that “past performance is not indicative of future results” comes to mind here, particularly as the consumer headwinds facing traditional retail have dramatically, and perhaps permanently, shifted. While there is no doubt that changes in consumer preferences are impacting some traditional retail heavyweights, (e.g., Sears, Macy’s), many other national brands are expanding their footprint and taking an omni-channel approach to retail by having a coordinated e-commerce and brick-and-mortar presence. We see this from e-commerce juggernauts like Amazon, Best Buy and Apple. Also, in looking at publicly traded REIT data, retail REITs are successfully growing leasing spreads, while anchor tenant occupancy, despite the headlines, remains high at 96%+.

**Chart 29: REITs and Retail Today**

Store Closures vs. Store Openings



Source: Kimco (NYSE: KIM)

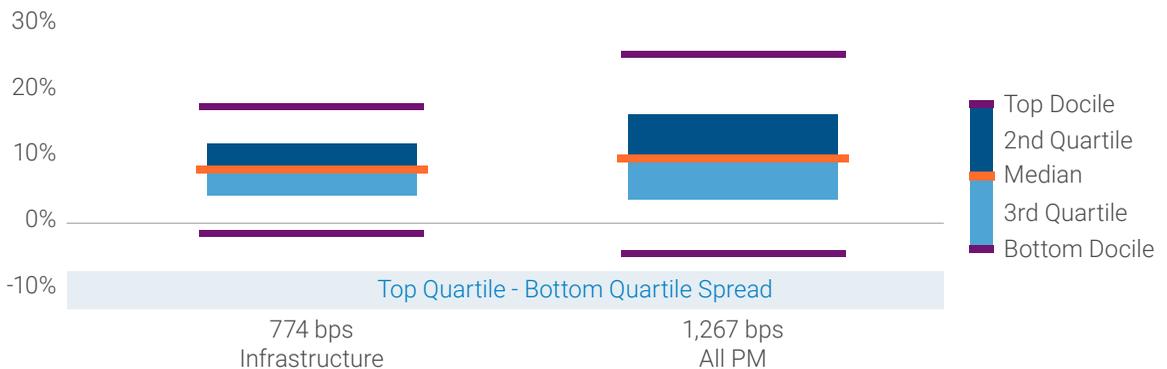
Having highlighted some of the best and the worst of the real estate market, where do we go from here? The real estate market remains healthy, with late cycle risk indicators still in check. Although appreciation has slowed, operating fundamentals continue to benefit from the strength of the global economy with moderate levels of new supply and strong absorption. At the same time, debt levels and borrowing terms remain prudent. In an environment of level to moderately increasing cap rates, our view is the strategies that may be best positioned to outperform are those that can create cap rate compression through portfolio sales or improvements to length and quality of cash flows. Domestically, cap rate spreads have tightened as interest rates have increased, whereas certain international locales are a relative value. We believe the U.S. is the farthest along in the cycle, with a sparse universe of opportunistic investment opportunities.

## Infrastructure

Infrastructure may be another “best of times” sub-sector of real assets, with strong investor demand and rising asset valuations tied to accelerating global GDP growth. Macro tailwinds have been especially strong in the transport and communications sectors, while energy infrastructure has struggled. Investor demand for infrastructure has been incredibly strong. One of the reasons institutions flock to infrastructure is because of the more narrow range of outcomes and strong downside protection offered by these assets (Chart 30).

### Chart 30: Dispersion of Infrastructure Returns

Vintage Years: 1979-2018<sup>1</sup>



Source: Hamilton Lane Data via Cobalt. As of 9/30/18; All PM includes secondary fund-of-funds and fund-of-funds.

For the 36-year period of 1979-2015, the performance spread between the top and bottom infrastructure managers was just 774 bps relative to the 1267 bps spread experienced by other private market categories. The top quartile (and especially top decile) returns in other private market asset classes may be significantly higher than infrastructure, but the downside spreads are also more pronounced. At the median, infrastructure has returned ~10%, with a bottom quartile return that is barely less than zero. What this means for investors is that the prospect of losing money in infrastructure investments has been historically lower than that of doing so in other private market investments.

There are a few major themes shaping infrastructure investment markets today. The first is the changing nature of the power generation stack in the U.S. and abroad.

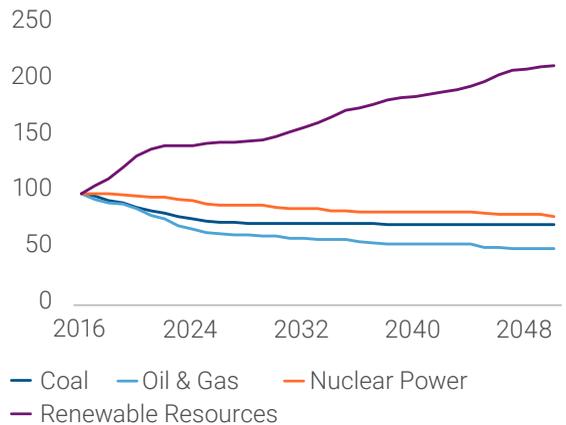
In terms of new power investments, renewable sources are expected to be the only subset of generation mediums to grow over the next 30 years; all other power generation sources are expected to decline (Chart 31). The repeal of the Clean Power Plan (“CPP”) could have been viewed as extending a lifeline to coal and fossil fuel generation, and yet, even with the repeal of the CPP, coal and older, inefficient forms of fossil fuel generation have continued to decline (Chart 31).

Power markets have been subject to much the same distress as E&P markets. Due to the precipitous decline in natural gas prices, wholesale power prices have also suffered substantial declines in major markets, averaging approximately 35%. The generation stack is also in flux, with up to 100GW (32%) of coal capacity expected to be decommissioned by 2020 (EPA Analysis of the American Power Act in the 111th Congress, June 2010).

For our part, we historically have approached renewables, particularly in the U.S., with a healthy degree of skepticism, as many renewable forms of power generation have struggled to achieve grid parity with traditional sources, particularly in light of abundant and cheap domestic natural gas. In light of their higher generation costs, the uptake of renewable technologies has been artificially fueled by federal and state subsidies, either in the form of direct payments, tax credits and/or minimum generation standards.

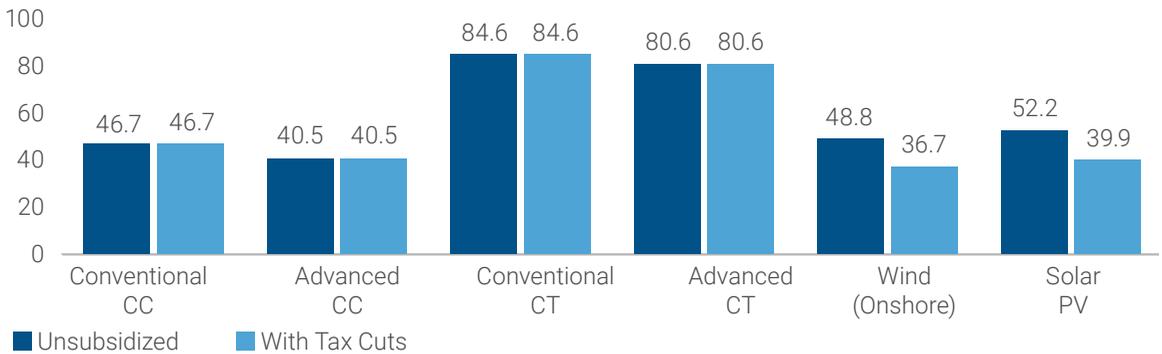
However, this is beginning to change. Wind power has experienced rapid technological advancements in recent years that have made it cost-competitive with fossil fuels in some regions without artificial subsidy support. These developments have contributed to dramatic growth in the sector, increasing from only 1% of total U.S. power generation in 2010 to 7% of total U.S. power generation in 2018. (U.S. Energy Information Administration, April 2019). In fact, 46% of all new electric generating capacity in 2019 in the U.S. will come from wind. (U.S. Energy Information Administration, January 2019).

**Chart 31: U.S. Electrical Power Generation Capacity Change by Sector**



Source: EIA Annual Energy Outlook 2018. As of 12/31/18

**Chart 32: Levelled Cost of Electricity for generation resources entering service in 2021  
(based on 2018 \$/MWh)**



Source: U.S. Energy Information Administration, Annual Energy Outlook 2019

Moreover, the economics of wind projects are improving. Capacity factors are rising due to technological advancements and construction costs have fallen 20-30%, making wind the only renewable technology that is currently competitive with traditional power generation on both a pre-subsidy and after-subsidy basis (Chart 32). Advancements in solar panel technology are rapidly lowering the generation costs there as well, as Solar PV is also approaching grid parity on a subsidized basis.

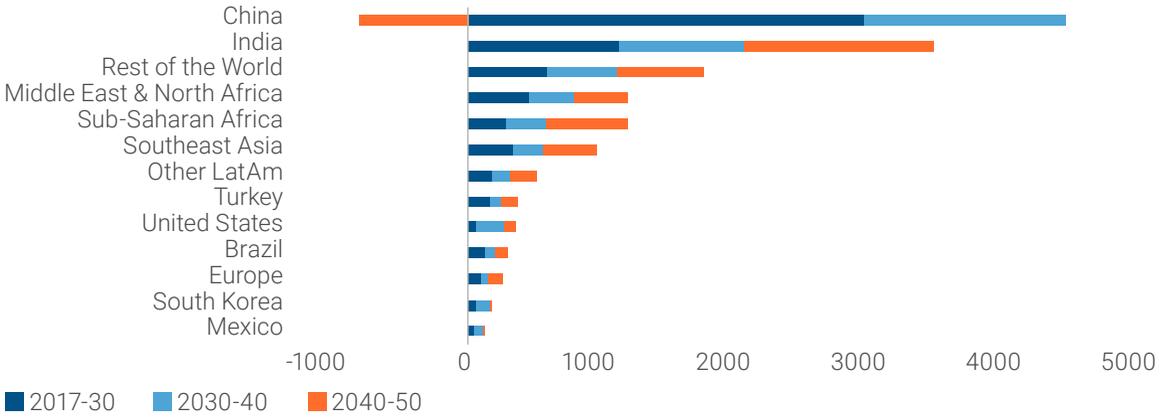
A number of meaningful limitations to renewable penetration remain. The first is transmission, and the second is storage. Take wind, for example. Many of the largest wind resources are located far away from primary load centers, requiring long distribution lines to connect the wind generation resource to the power demand centers. These long-haul transmission lines have been difficult to permit in some markets, making it challenging for utilities to provide offtake contracts for the wind power generated from these resources.

Storage, as well as the inability to dispatch renewable resources when demand loads are greatest, presents another impediment to renewable penetration. Although battery technology improvements have been made, the storage and dispatch infrastructure required to support these renewable generation assets is expensive. The lack of dispatch of renewable resources has also created significant demand for peaking units that can serve to smooth out the power delivery for grid operators.

All of this results in a power complex that is undergoing significant technological and regulatory disruption, making it difficult to underwrite what the ultimate generation stack in the U.S. will look like.

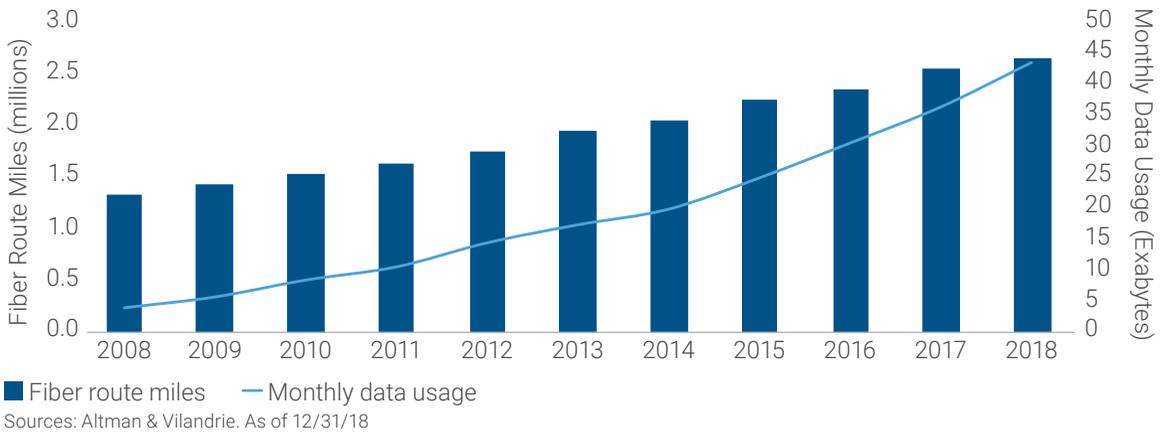
On a related theme, the demand for power in the U.S and other developed markets is flat-to-declining:

**Chart 33: Change in Gross Electricity Demand - TWh**

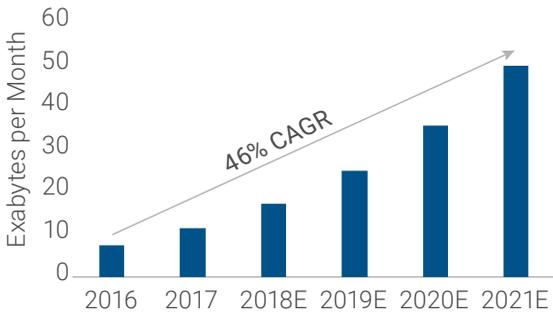


If you think about the generation of electrons like any other commodity, the growth in demand for that commodity is expected to be greatest in developing markets. The issue at hand is transporting power over long distances is both expensive and difficult. Therefore, when thinking about the infrastructure required to support power generation, the growth in demand makes opportunities outside the U.S. appear more attractive.

**Chart 34: U.S. Cumulative Fiber Route Miles & Monthly Data Usage**



**Chart 35: Mobile Data Traffic**



Source: Cisco VNI Mobile. As of 12/31/18

Another theme shaping infrastructure investment today is the rapid growth in data usage and the infrastructure required to support so many interconnected devices. An increasing number of infrastructure fund managers have made data and communications infrastructure a primary focus of the types of assets they are looking to own. This is a theme and a sub-sector of infrastructure investment that we expect will continue to attract meaningful capital, particularly as the capital expenditure requirements to build out 5G LTE networks will be significant.

Lastly, it's worth highlighting that the definition of what constitutes "infrastructure" continues to shift and expand. The markets for core and core-plus infrastructure assets are extremely competitive. The search for yield, combined with the entry of low cost-of-capital players into the infrastructure space, has bid up assets with high-grade contracted cash flows, low operational intensity and low ongoing capital expenditure requirements. In addition, the strength in the private infrastructure fundraising market has increased competition for all types of infrastructure assets. As a result, some GPs have shifted to pursuing "infrastructure-like" assets within their mandates:

**Chart 36: Infrastructure – Emergence of “Non-Traditional” Sectors**



Source: Hamilton Lane. For illustrative purposes only.

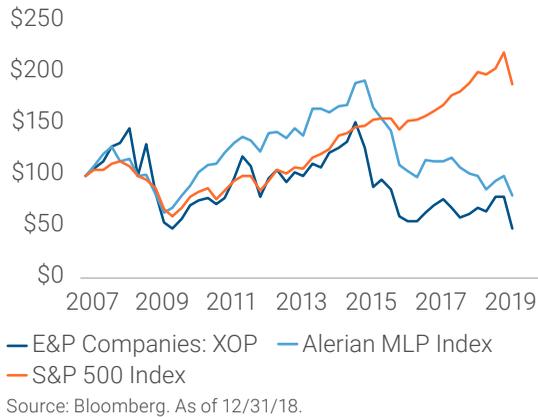
The emergence of non-traditional infrastructure is a theme we are watching carefully. It's too early yet to tell if this is reflective of "the age of wisdom" or "the age of foolishness." The "wisdom" camp would argue that inflated valuations in traditional infrastructure assets create basis risk that is difficult to overcome, making it more prudent to pursue infrastructure-like sectors with better growth prospects at cheaper prices. The "foolishness" camp would argue that truly irreplaceable infrastructure assets with long-term, contracted cash flows are worth paying a premium for, especially if we are entering an economic cycle with more risk to the downside.

As infrastructure GPs increasingly target potentially riskier business models, they may do so at the expense of the core investment characteristics that make infrastructure attractive.

## Energy

There are few markets in which the “season of light”/“season of darkness” dichotomy is better exemplified than today’s energy markets. The Permian Basin is currently experiencing a renaissance, accounting for approximately 80% of all active drilling rigs in the U.S. Most other production regions, particularly in the U.S., have been left out in the cold, with some signs of better times on the horizon, not the least of which has been recent increases in commodity prices. (Chart 41).

**Chart 37: Public Market Energy Returns**



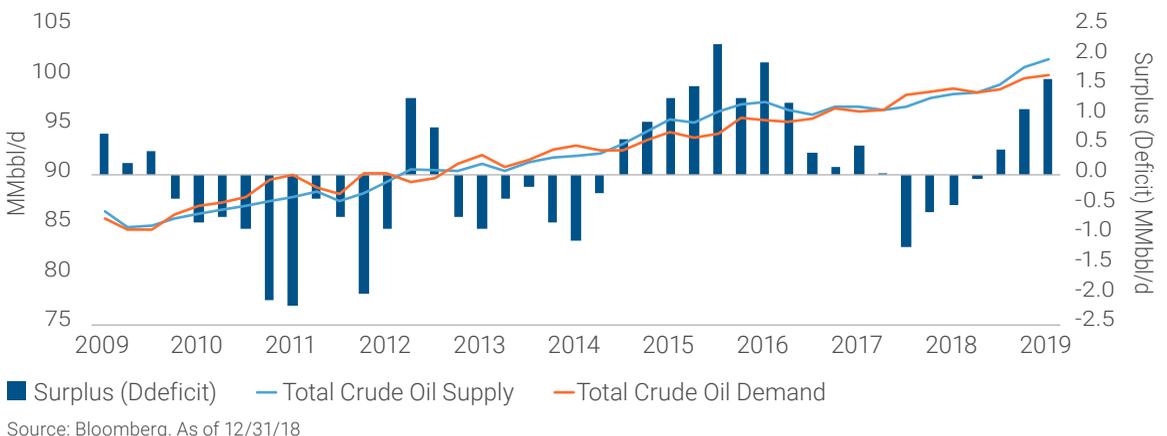
**Chart 38: North American E&P EBITDAX and Capex**



A dramatic fall in commodity prices, beginning in 2014, may have kicked off some of the despair still being felt in the energy space today. Despite having recovered somewhat recently, commodity prices are still a far cry from the days when oil was more than \$100 per barrel. At the time, an increase in U.S. production concurrent with the reintroduction of Libyan, Iraqi and Iranian production into world markets caused a massive positive supply shock, further exacerbated by OPEC’s reluctance to cut production in order to retain market share. Inventories increased alongside production and the price of oil fell more than 75% from its peak (Bloomberg, November 2018). Natural gas has also suffered: the U.S. is awash in shale gas and, until recently, there was a global glut of Liquefied Natural Gas (LNG) capacity that drove down prices in Europe and Asia.

The effect of abundant supply on prices has been exacerbated by the strong U.S. dollar. Not surprisingly, in response to low commodity prices, companies have slashed capital spending to preserve cash for debt service and maintaining existing production. This approach bolsters near-term cash flows, but oil and gas production depletes reserves, so a dollar cut today results in lower production tomorrow.

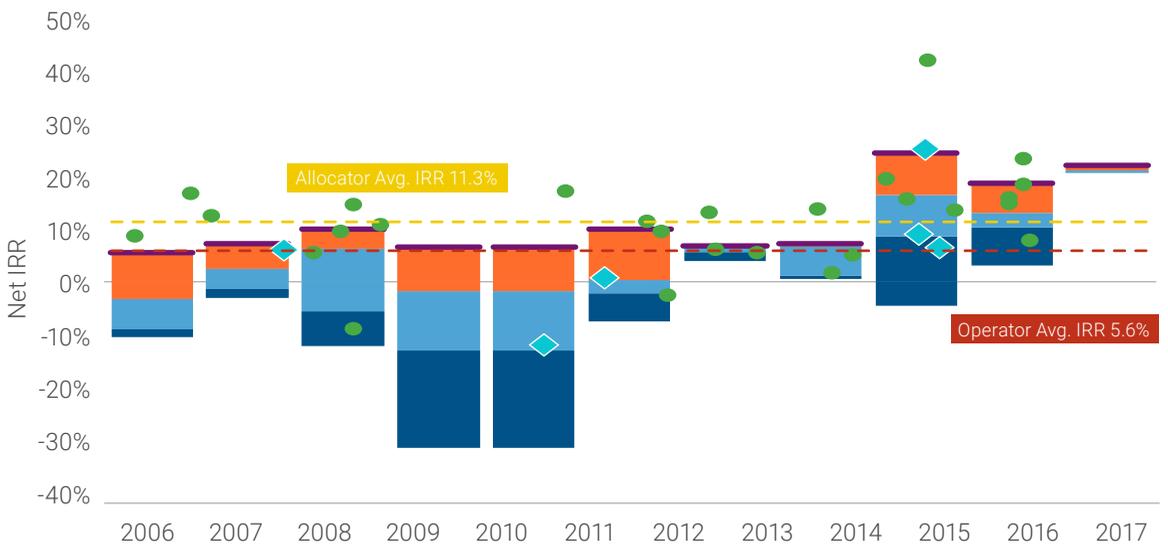
**Chart 39: Supply and Demand**



The impact of the energy commodity price rout has been severe on those companies involved in the industry. The energy sub-sector of the S&P 500 has underperformed the index by more than 20% over the past two years and its sector weighting in the S&P500 has declined by 60% since 2008. Many small-cap exploration & production companies have suffered massive declines and some have filed for bankruptcy.

Commodity cycles also have exposed the relative risks of various energy private equity strategies. Historically, operator models were thought to be more conservative given their primary focus on acquiring assets with high levels of current production. However, the fall in commodity prices has highlighted some of the risks to the operator model, namely in the form of chunky exposures to commodity prices and leverage that is cross-collateralized across the portfolio. In contrast, allocator models have generally outperformed operator models due to lower commodity price exposure at investment, a slower deployment pace of capital, and limited leverage that is isolated at the portfolio company-level. Chart 40 highlights the return differences experienced by Allocator funds vs. Operator funds over the last 10 years.

**Chart 40: Energy Strategy**



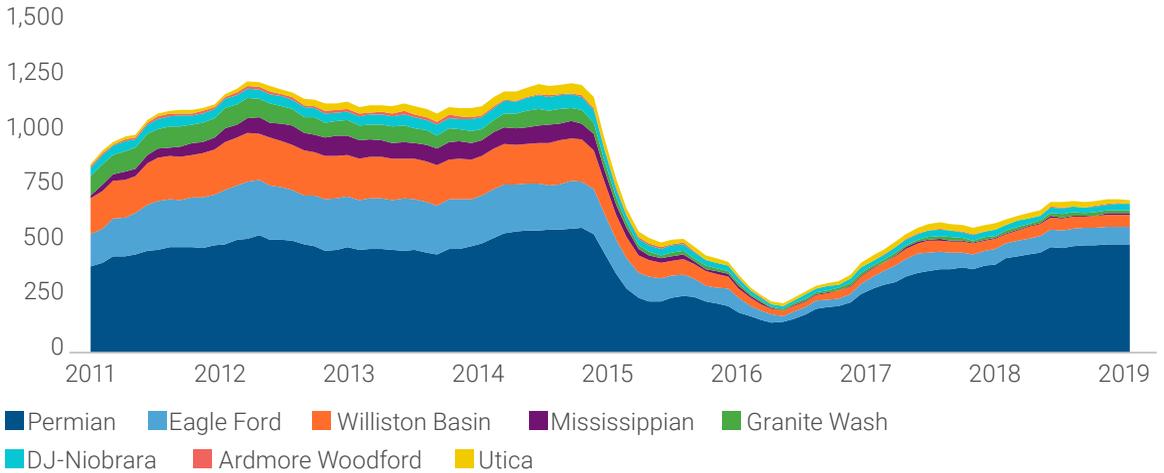
**HL Benchmark**

- Top Q Hurdle
- 2nd Q
- 3rd Q
- Bottom Q
- Energy Allocator GPs
- ◆ Energy Operator GPs

Source: Hamilton Lane Fund Investment Database as of most up to date benchmark. Hamilton Lane energy benchmark as of 12/31/18. For illustrative purposes only. Actual results may vary.

Overall, the capital markets have tightened, creating both opportunities as well as risks to existing private equity positions. Existing portfolio companies have lost their primary exit option – strategic sales – as E&P companies have excess drilling inventories and few financing options. The corollary to this is that E&P companies are looking to bolster their balance sheets and bring their drilling inventories to more manageable levels, leading to the sale of non-core assets. Well-funded private equity funds with industry experience may be positioned to purchase these assets or provide structured finance solutions.

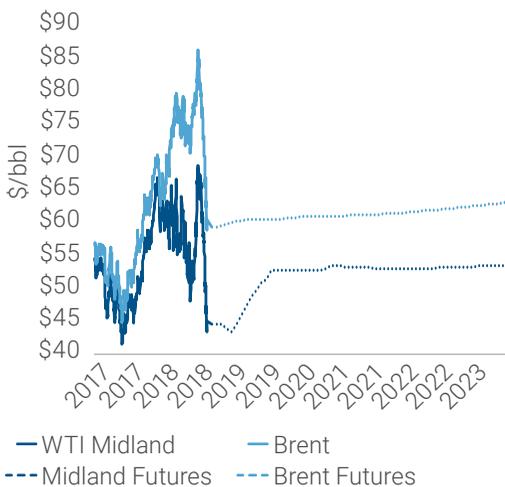
**Chart 41: Rig Count-Oil**



Source: Bloomberg. As of 12/31/18

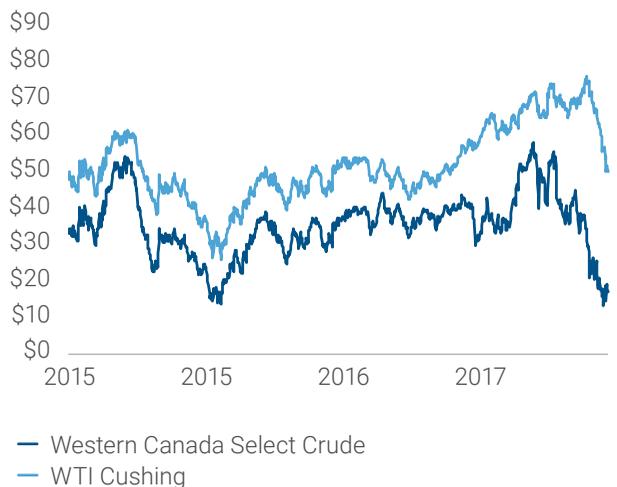
It is important to note the significance of a single U.S. basin on much of this story: the Permian. The Permian Basin consistently has exceeded oil, liquids and gas production expectations. It is expected to produce roughly 4 million boe/d in 2019, significantly exceeding production growth forecasts from even a few years ago (Chart 44). All of this production growth has not yet been met with a corresponding increase in midstream infrastructure to move production from the basin to the coast. This has led to a sometimes substantial and volatile price differential between WTI-Midland, which represents the price of oil in the Permian Basin, and Brent, which represents coastal U.S. oil. This differential has narrowed substantially, as new pipeline projects are developed, but highlights the importance of assessing physical commodity markets, as well as financial ones. In Chart 43, you can see that the historical differential has been even more stark in Canada, leading to a substantial decline in Canadian E&P company share prices.

**Chart 42: WTI Midland vs. Brent Oil Prices**



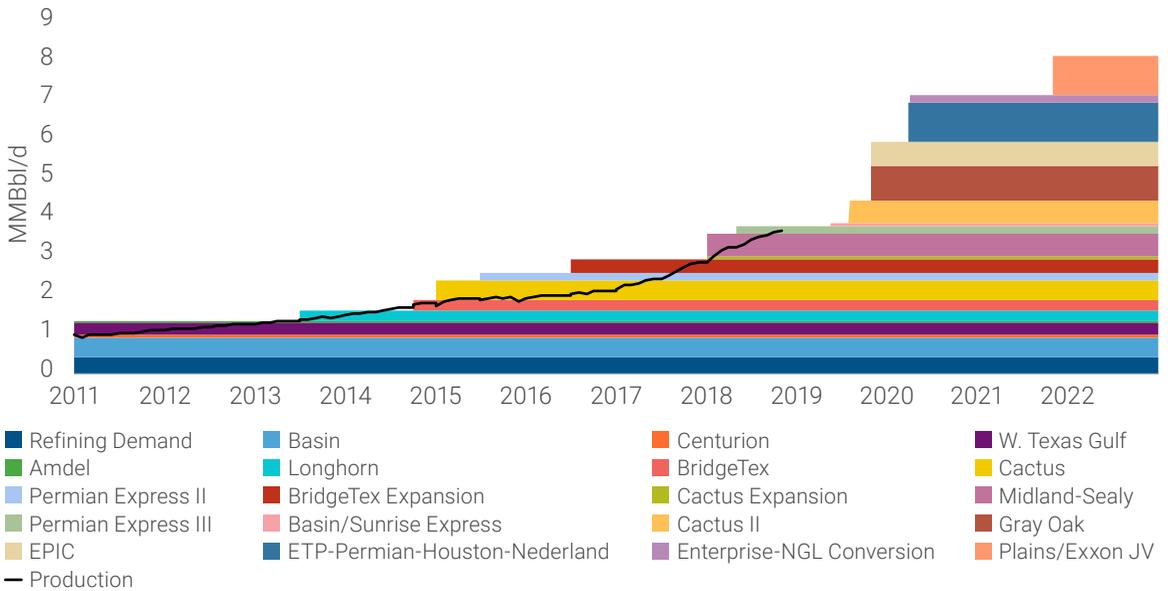
Source: Bloomberg. As of 12/31/18

**Chart 43: Western Canada Select Crude vs. WTI Pricing**



Source: Bloomberg. As of 12/31/18

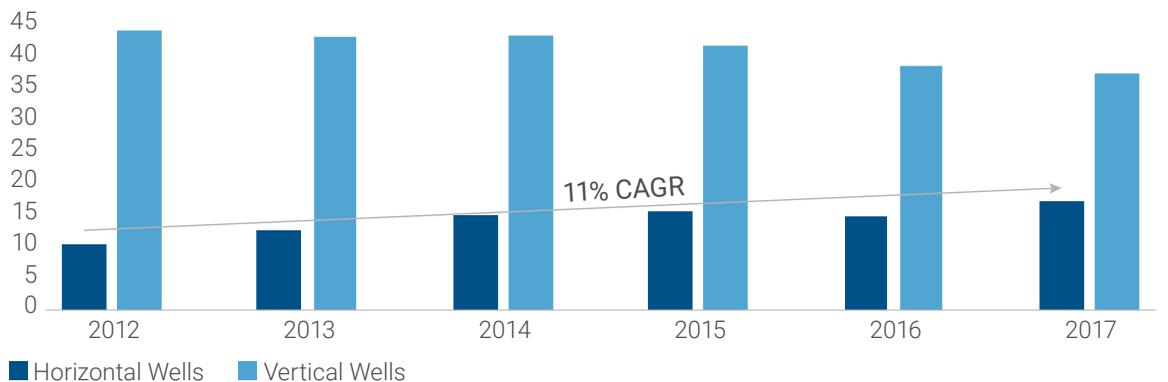
**Chart 44: Permian Midstream Takeaway Capacity**



Source: RBN Energy, Bloomberg, EIA, Hamilton Lane (December 2018)

These differentials are the reason that midstream infrastructure exists. Substantial opportunities remain to participate in the buildout of U.S. energy infrastructure as shale production continues to change the supply-demand map. One emerging midstream story making headlines is increasing water production. Oil wells, on average, produce more water than they do oil and all of that water needs to be disposed of appropriately. Midstream companies with a workable solution for water disposal that is cost-effective for producers can expect substantial growth as new wells are drilled.

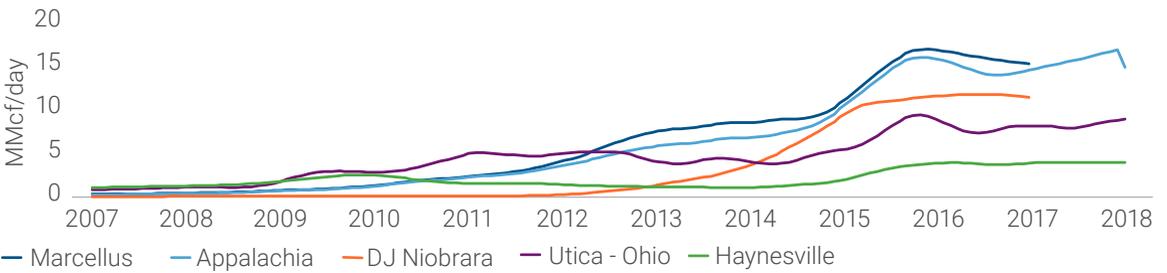
**Chart 45: Horizon vs. Vertical Well Water Production**



Source: Barclays & HIS. As of 12/31/17.

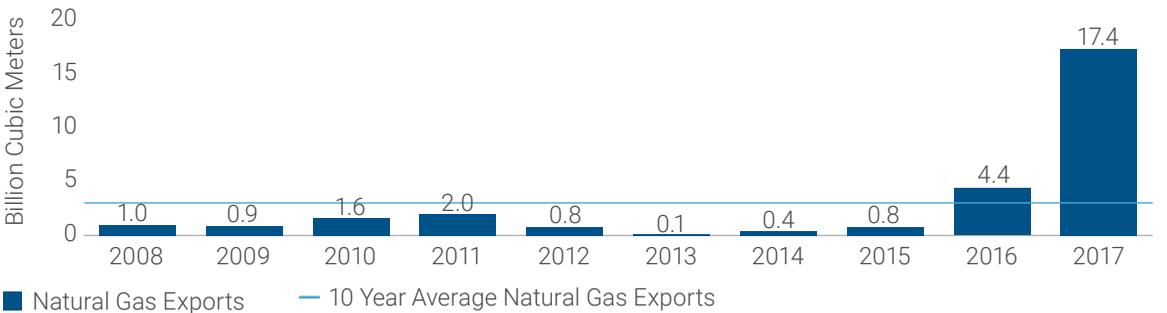
What was a “winter of despair” this past year for many on the East Coast of the U.S. was anything but for natural gas market participants who were well positioned to take advantage of the dramatic swings in price and indications of market tightness. Natural gas markets have been incredibly localized this past winter, with wild swings based on weather and access to supply. Producers have contended with low gas prices over the longer term by becoming more efficient. They also have looked to export markets to reduce excess supply.

**Chart 46: Production per Additional Rig - Gas Plays**



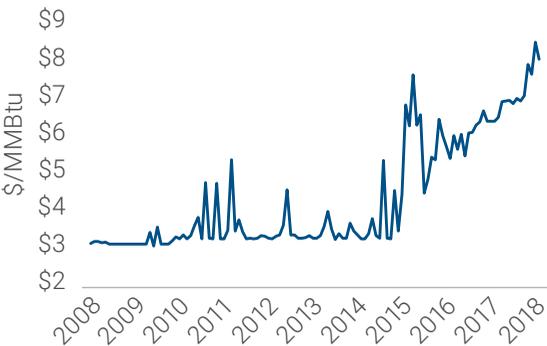
Source: Bloomberg. As of 12/31/18

**Chart 47: U.S. Natural Gas Exports**



Source: Bloomberg (April 2019)

**Chart 48: China LNG Import Price**



As of 3/31/18  
Source: Bloomberg (April 2019)

Until very recently, there was a global glut of LNG capacity, driven by substantial supply investment in the Middle East and Australia. Recently, China announced that the country would increase its consumption dramatically in order to move from coal-fired power to cleaner natural gas, causing a rebound in Asian LNG prices.

Private equity participants in the energy market are also subject to dual markets. Those funds looking to sell assets purchased prior to 2014 are paying for their age of foolishness. Many of these assets were purchased with the expectation that they could be sold to a public market participant or IPO, but those markets have all but disappeared for the near term. These funds will need to find creative solutions to maximize value, while others, boasting fresh capital, may well find this to be an opportune time to invest.

The decline in commodity prices has caused substantial short-term changes to the global energy industry. Longer term, the ensuing underinvestment in supply has set the stage for tight markets and, therefore, rising commodity prices in the future. It also has imposed substantial discipline on the survivors, who will emerge much stronger and more focused. Midstream opportunities remain attractive, especially as upstream companies look for partners in their development or purchasers for assets still on balance sheets. Significant investment is required to connect domestic production in emerging basins to large domestic and international end markets. The global energy supply chain also requires significant investment as Asia becomes the nexus of consumption.

## Agriculture

Returns in agriculture raged like wind and fire coming out of the Global Financial Crisis, particularly for permanent crops, but recent data suggests this is coming to a stop, which we believe is a good thing.

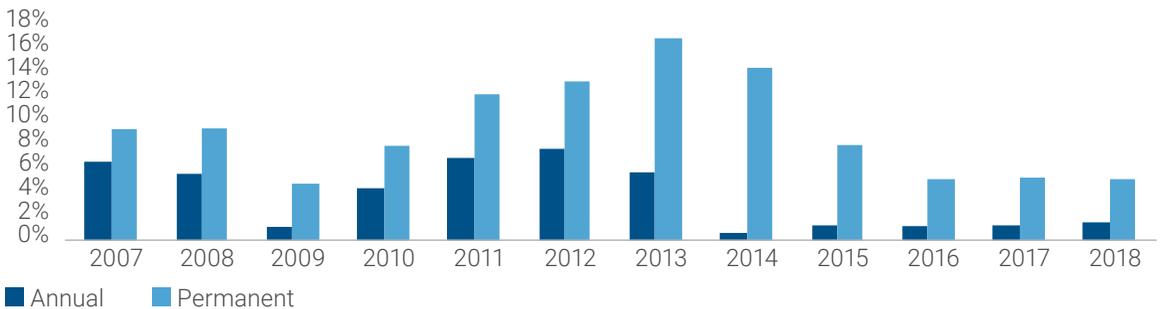
Land price appreciation has consistently provided a large portion of farmland total returns, especially during recent periods marked by low commodity prices and falling net incomes. Over the past 10 years, permanent crops have outstripped annual crops in terms of both income and land price appreciation. Permanent crop farmers have been successful at growing fruit and nut varieties that benefit from premium pricing, especially in targeted export markets.

**Chart 49: NCREIF Farmland Annual Returns**



Source: NCREIF. As of 12/31/18

**Chart 50: NCREIF Farmland Property Type Returns**



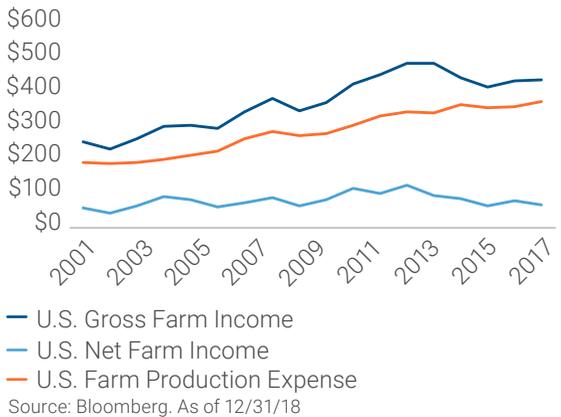
Source: NCREIF. As of 12/31/18

Agricultural land appreciation is starting to reflect subdued income expectations, which is healthy for long-term agriculture investment.

**Chart 51: U.S. Farmland Value vs. Income**



**Chart 52: U.S. Farm Income vs. Expense**



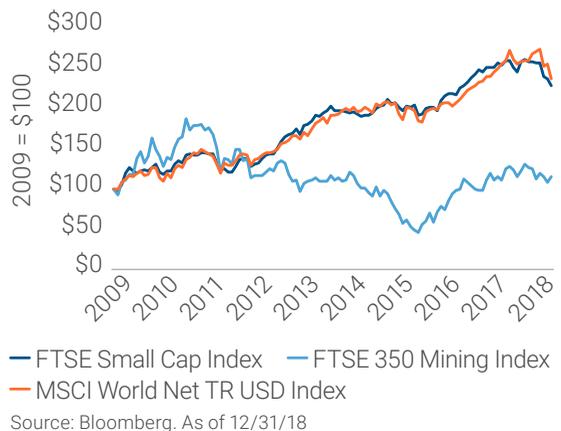
Going forward, the impact of agricultural tariffs in key export markets and restricted access to water adds risks to agriculture investments. China and Mexico are important trading partners to U.S. farmers and tariffs are expected to reduce farm incomes significantly. More broadly, however, emerging market demand for protein sources continues to accelerate as available arable land decreases. Water scarcity also continues to be an issue, and premiums will continue to be paid for well-located properties with priority access to water. The emergence of controlled-environment indoor growing operations also has the potential to disrupt some traditional value chains. Traditional strategies are expected to have mid-single digit returns going forward and will have to contend with these issues.

Broadly, consumption of all food crops continues to grow, and demand is either catching up with or outstripping supply. Long term demand fundamentals are still strong for agriculture, but the short term may be volatile. We favor patient capital deployment in strategies that target permanent crops, such as apples and almonds, both in the U.S. and globally, because of their high current income, long life and strong global demand characteristics. Water is potentially an attractive area for investment given scarcity value, but monetization mechanisms, at least in the U.S., have been slow to develop and institutional ownership of water resources remains a politically sensitive topic. We also favor some vertical integration in agriculture strategies, as the valuation risk in land can be partially mitigated through margin capture at various stages in the agriculture value chain. While vertically integrated agriculture strategies offer additional return potential, they also inject additional business and operating risks that need to be properly underwritten.

## Mining

After a challenging few years in the mining sector, there are reasons to believe that sector fundamentals are slowly giving way to a “spring of hope.” Falling commodity prices due to concerns about slowing growth in Asia resulted in significant value destruction to mining equities from 2012-2015 (Chart 54). As a result, companies slashed capex budgets while

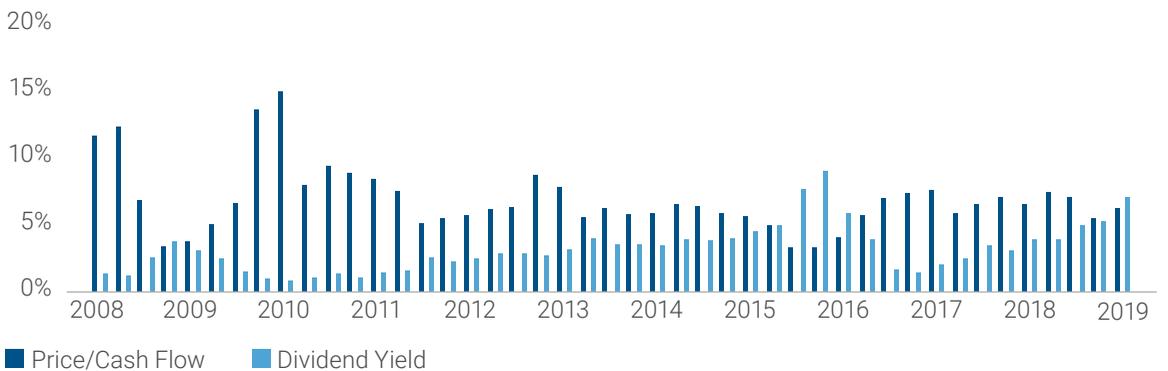
**Chart 54: Mining Performance vs. Broader Market**



refocusing their portfolios on core commodities and their most scalable assets. Large debt burdens built up during the good times, leading to sharp reductions in capex and exploration spending. Capital markets closed, and mining companies were capital constrained resulting in an underinvestment in long-term supply.

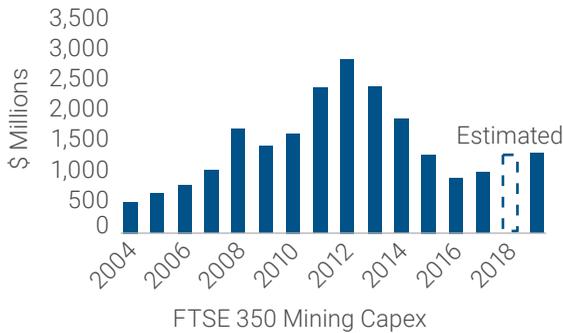
With that said, green shoots are emerging, as mining companies have lowered leverage, increased dividend payouts and returned to achieving positive returns on assets and equity. Even with these improvements, access to new growth capital has remained challenging for the major miners. Additionally, global mining capex is down over 50% over the past five years (Bloomberg, June 2019). These capital market constraints and the strategic refocusing of major miners on core commodities has resulted in opportunities for private capital, as private equity has been able to pursue non-core assets from major producers.

**Chart 55: FTSE 350 Mining Index Price/Cash Flow vs. Dividend Yield**



Source: Bloomberg. As of 3/29/19.

**Chart 56: Mining Capital Expenditures**



Source: Bloomberg. As of 12/31/18

**Chart 57: Historical Leverage Ratio**



Source: Bloomberg. As of 3/29/19

Demand for mined commodities still hinges on growth in emerging markets, with a few notable exceptions. Specialty commodities related to vehicle electrification and renewable energy are experiencing a secular boom, driven by sharply increasing demand. Other commodities are still substantially below their peak levels, as concerns about global growth and trade weigh on investment. However, consumption continues, and market conditions are beginning to tighten for many commodities. Tight markets have historically led to rapid price increases in mined commodity markets.

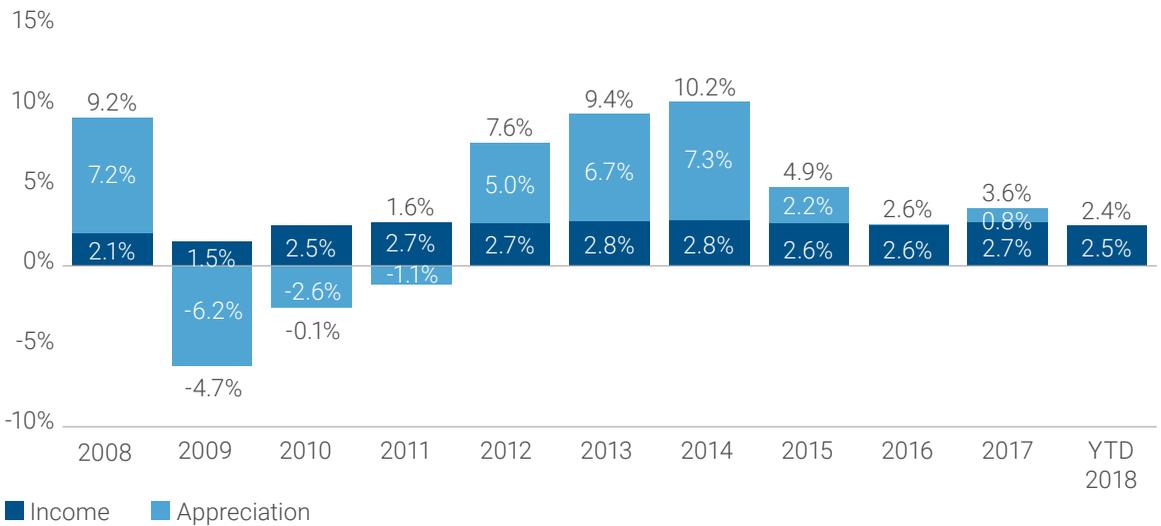
The next bull market is likely to be supply-driven, as the industry has underinvested in growth. Now that sector leverage is back below its 10-year average, we expect companies to turn to growth either through exploration or M&A; indeed this has already begun with Barrick's acquisition of Randgold and Potash Corp's merger with Agrium.

Mining companies continue to sell off non-core assets, creating potential opportunities for private equity to purchase them at attractive prices. The industry appears to have fundamentally changed in that exploration is now conducted almost solely by emerging "junior" mining companies while larger producers are more likely to come into projects as they get closer to meaningful production. Junior mining companies are starved for capital to advance their projects, so comprehensive private financing strategies can be attractive.

## Timber

The timber markets have been mired in their "winter of despair" for some time now. Inventories are still above their historical average and, while demand is increasing, it lags supply. All of this has contributed to low returns in the recent past in terms of both income and appreciation.

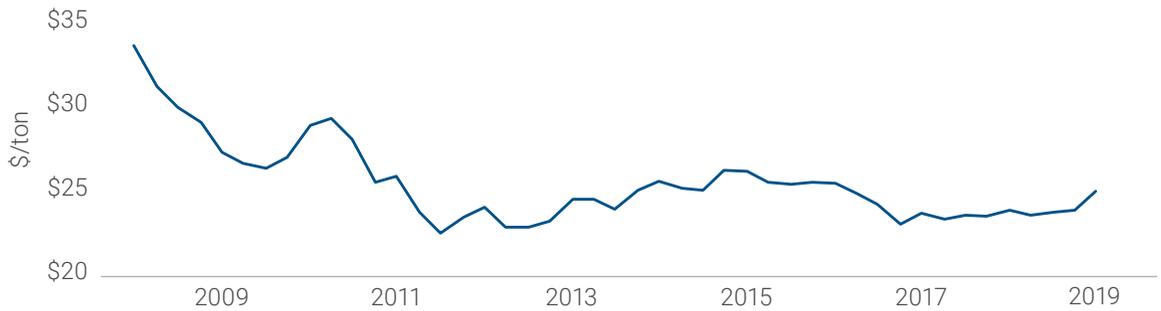
**Chart 58: NCREIF Timberland Returns**



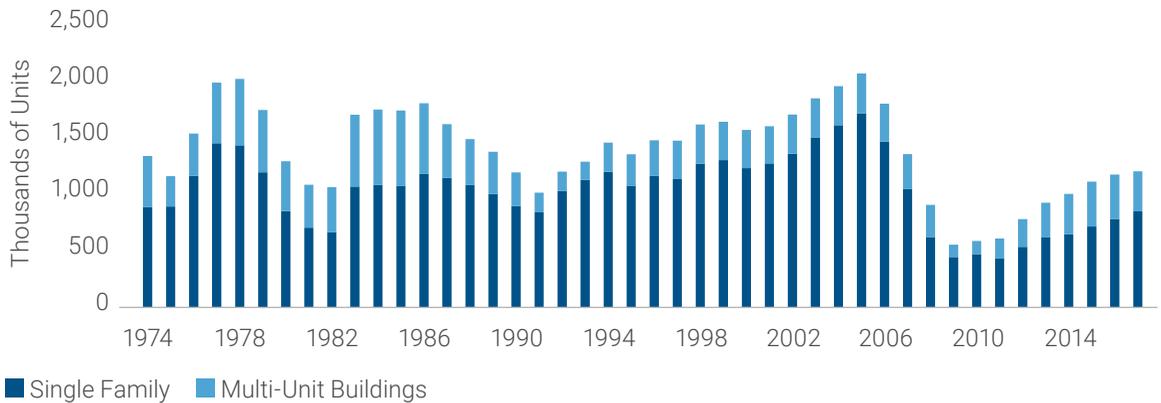
Source: Bloomberg. As of 9/30/18

There is a glut of mature timber in the U.S. Southeast, which has led to low prices and a fight for mill capacity. Anything other than top-quality logs are subject to steep discounts and prices that may not even cover haulage. The Pacific Northwest is sensitive to Chinese growth, as much of its supply is destined for export.

Following a period of low returns and a lack of realizations, we remain cautious about U.S. timber investment. Those looking for high rates of return ought to look to special situations within the timber industry. Excess inventories from the financial crisis have still yet to be absorbed. When they are, we may expect the market to tighten, but not until then.

**Chart 59: Timber Mart-South, Pine Sawtimber Stumpage Price**

Source: Bloomberg. As of 3/29/19.

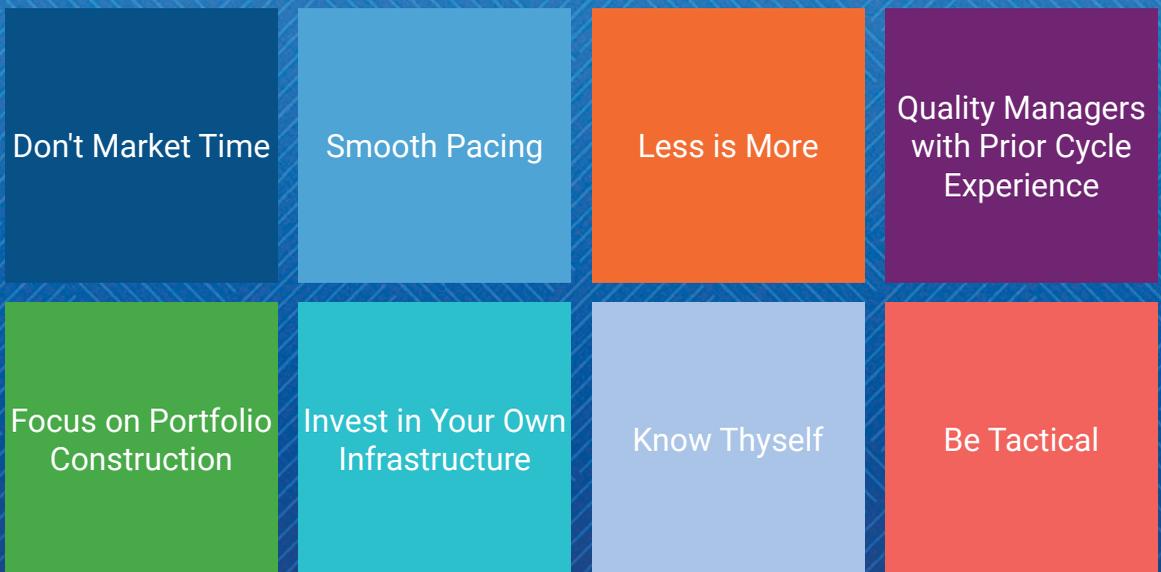
**Chart 58: U.S. Private Housing Unit Starts<sup>1</sup>**<sup>1</sup>U.S. Census Bureau. Data through 3Q'18.

There are reasons for optimism, however, as demand fundamentals are continuing to improve, mill expansion is happening in key timber markets and supply constraints, especially in Canada, are helping to reduce timber inventories that should ultimately improve prices. Over time, these improving supply and demand fundamentals should help to benefit U.S. timber, particularly as it seeks to compete in Asian markets. Long-term macroeconomic fundamentals are supportive for timber allocations, but the time frame could be long as significant stumpage inventories need to be brought down to see any sustained price improvements.

## Where do we go from here?

We've addressed real assets in the superlative by indulging, nursing, stretching and exploiting Dickens' "best of/worst of" theme. With that, we know you're asking the obvious question...so what? What "age of wisdom" themes (we know, enough with Dickens already) can we share to drive value in institutional portfolios?

If you happened to read our latest annual Market Overview – and, let's be honest, how could you not? – then you may recall that we capped off this year's tome by outlining the Eight Pillars of Wisdom for private markets investing in the year ahead. Well, we're repurposing that here, adjusted slightly for the real assets market.



## Focus on Portfolio Construction

Have a plan for how you're going to approach your portfolio. Portfolio construction within real assets is crucial, and the proliferation of managers in the space can result in significant sector concentration if not actively managed. Whereas simply targeting multiple buyout managers in a private equity portfolio can provide sufficient sector diversification, under the real assets umbrella sits a collection of related, but distinct subsectors, and investment strategies, and sector diversification within a real assets portfolio is an important consideration. Investors will need a plan for how the various real assets subsectors work together and compete on the margin for capital allocation.

## Definitions

**Clean Power Plan (CPP)** – An Obama administration policy aimed at combating anthropogenic climate change (global warming) that was first proposed by the Environmental Protection Agency (EPA) in June 2014. The final version of the plan was unveiled by President Obama on August 3, 2015.

**Real Estate: NCREIF Property Index** – The NCREIF Property Index is a quarterly time series composite total rate of return measure of investment performance of a very large pool of individual commercial real estate properties acquired in the private market for investment purposes only. All properties in the NPI have been acquired, at least in part, on behalf of tax-exempt institutional investors – the great majority being pension funds. As such, all properties are held in a fiduciary environment. Source: Bloomberg

**FTSE NAREIT** – The FTSE NAREIT All Equity REITs Index is a free-float adjusted, market capitalization-weighted index of U.S. equity REITs. Constituents of the index include all tax-qualified REITs with more than 50% of total assets in qualifying real estate assets other than mortgages secured by real property.

**Moody's CPPI** – Transaction based price indices developed and published by Real Capital Analytics ("RCA"), a subsidiary of Moody's. The Index measures the actual price experience of property investors – the capital appreciation component of total return, by quantifying the change in prices based on empirical results of validated transaction. The index is based on transaction data exclusively compiled by RCA from research that includes the cumulative sourcing and cross-referencing of hundreds of independent sources.

**Bonds: Bloomberg Barclays US Aggregate Bond Index** – The Bloomberg Barclays US Aggregate Bond Index is a broad-based flagship benchmark that measures the investment grade, US dollar denominated, fixed-rate taxable bond market. The index includes Treasuries, government-related and corporate securities, MBS (agency fixed-rate and hybrid ARM pass-throughs), ABS and CMBS (agency and non-agency). Source: Bloomberg

**Energy: Cobalt Energy Manager Universe** - Includes all Private Equity Energy Managers from 1999 - 2016 that Hamilton Lane clients are invested with either on an advisory or discretionary basis. Source: Cobalt

**Infrastructure: Cobalt Infrastructure Manager Universe** - Includes all Private Equity Infrastructure Managers from 1999 - 2016 that Hamilton Lane clients are invested with either on an advisory or discretionary basis. Source: Cobalt

**Agriculture: NCREIF Farmland Index** - The NCREIF Farmland Index is a quarterly time series composite return measure of investment performance of a large pool of individual farmland properties acquired in the private market for investment purposes only. All properties in the Farmland Index have been acquired, at least in part, on behalf of tax-exempt institutional investors - the great majority being pension funds. As such, all properties are held in a fiduciary environment. Source: Bloomberg

**Timber: NCREIF Timberland Index** - The NCREIF Timberland Index is a quarterly time series composite return measure of investment performance of a large pool of individual timber properties acquired in the private market for investment purposes only. All properties in the Timberland Index have been acquired, at least in part, on behalf of tax-exempt institutional investors - the great majority being pension funds. As such, all properties are held in a fiduciary environment. Source: Bloomberg

**Mining:** The Mining index used is a combination of the following two indices:

1) 1999-2007 – 100% MSCI ACWI Metals and Mining Index - The MSCI ACWI Metals and Mining Index is composed of large and mid cap stocks across 23 Developed Markets (DM) countries and 24 Emerging Markets (EM) countries. All securities in the index are classified in the Metals & Mining industry (within the Materials sector) according to the Global Industry Classification Standard (GICS®). Source: Bloomberg

2) 2007-2016 – 100% Cobalt Mining Manager Universe - Includes all Private Equity Mining Managers from 2007-2016 that Hamilton Lane clients are invested with either on an advisory or discretionary basis. Source: Cobalt

**Private Equity: Cobalt Private Equity Manager Universe** - Includes all Private Equity from 1999 - 2016 that Hamilton Lane clients are invested with either on an advisory or discretionary basis. Excludes Real Estate, Fund of Fund, and Secondary managers/investments. Source: Cobalt

**Stocks: S&P 500 Index** - The S&P 500 index is a basket of 500 of the largest U.S. stocks, weighted by market capitalization. Source: Bloomberg

**Inflation: Consumer Price Index All Urban Consumers:** A measure that examines the changes in the price of a basket of goods and services purchased by urban consumers. Source: Bloomberg

**Real Asset Portfolio Weighting:** The Real Assets Portfolio uses the above indices to create a portfolio with the following weightings:

Real Estate – 40%

Energy – 20%

Infrastructure – 15%

Mining – 10%

Agriculture – 7.5%

Timber – 7.5%

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The following hypothetical example illustrates the effect of fees on earned returns for both separate accounts and fund-of-funds investment vehicles. The example is solely for illustration purposes and is not intended as a guarantee or prediction of the actual returns that would be earned by similar investment vehicles having comparable features. The example is as follows: The hypothetical separate account or fund-of-funds consisted of \$100 million in commitments with a fee structure of 1.0% on committed capital during the first four years of the term of the investment and then declining by 10% per year thereafter for the 12-year life of the account. The commitments were made during the first three years in relatively equal increments and the assumption of returns was based on cash flow assumptions derived from a historical database of actual private equity cash flows. Hamilton Lane modeled the impact of fees on four different return streams over a 12-year time period. In these examples, the effect of the fees reduced returns by approximately 2%. This does not include performance fees, since the performance of the account would determine the effect such fees would have on returns. Expenses also vary based on the particular investment vehicle and, therefore, were not included in this hypothetical example. Both performance fees and expenses would further decrease the return.

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As of May 23, 2019