APOLLO

Infrastructure Investing: Embracing Complexity in Times of Structural Change

Torsten Sløk, Partner, PhD, Apollo Chief Economist
Vittorio Lacagnina, Partner, Institutional Client & Product Solutions

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KEY TAKEAWAYS

- After a tumultuous 2022, the US economic outlook for 2023 remains uncertain. Inflation appeared to have peaked at year-end, but continuing strong job growth in January suggests that upside risks to inflation remain. The Fed may need to raise rates more and keep rates higher for longer to get inflation all the way back to its 2% target.
- This "no landing" scenario is negative for markets because higher rates for longer increase the downside risk for equities and credit. In this environment, we believe a focus on downside protection is paramount. In fact, we have already witnessed a marked shift in investors' attitude away from a single-minded focus on upside opportunity toward investment strategies that can mitigate market volatility as well.
- With that in mind, we believe that infrastructure can offer key attributes—lower correlation to the market cycle, potential protection against inflation—that are particularly attractive for investors seeking to deploy capital today.
- We believe that a nuanced infrastructure investment strategy with a disciplined, price-conscious investing mindset—purchase price matters—is more crucial than ever. We see the middle-market as the most fertile ground for opportunity, especially at a time when the large-capitalization space is awash in capital.
- We believe a flexible investment strategy works well across cycles but performs particularly well during periods of market dislocation. The toolkit is predicated on three primary types of investment: equity buyouts, corporate carve-outs, and structured solutions.

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The macro environment has changed since early 2022. The previous era of low rates and loose monetary policy had fueled risky asset prices and ushered a period of lower volatility. Those days are over, at least for now. Tighter monetary policy as a response to higher global inflation has roiled public markets. And yet inflation has remained stubbornly above the Federal Reserve's 2% inflation target.

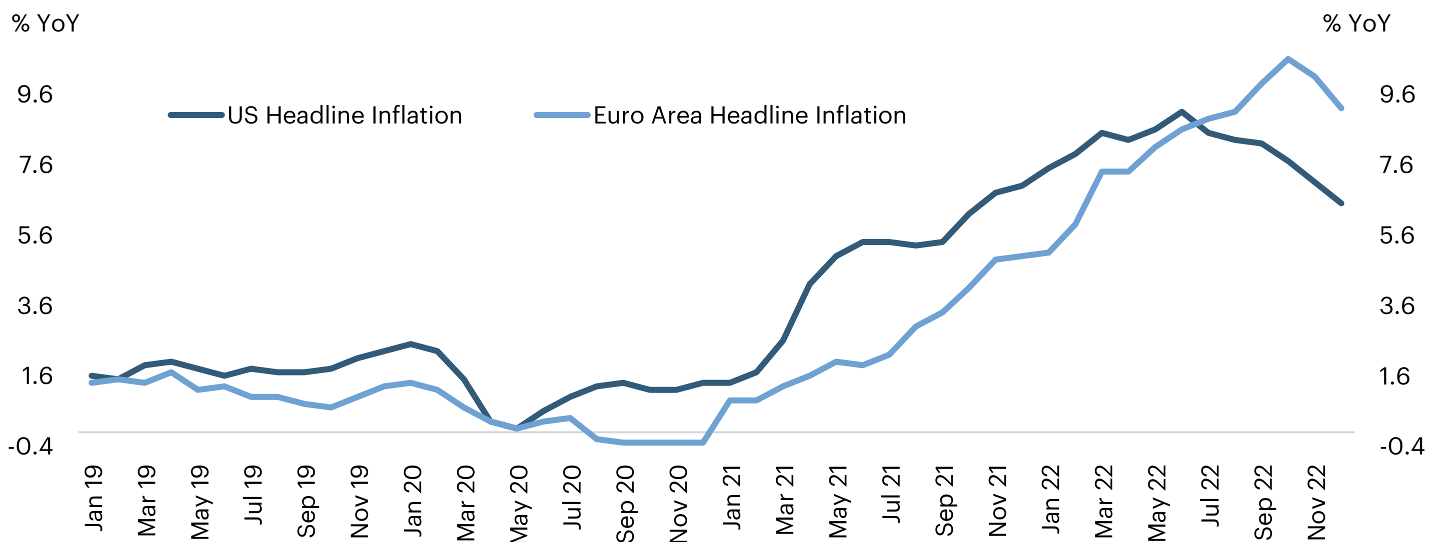
With high and persistent broad-based inflation, the Fed shifted to a hawkish stance in 2022, increasing rates at the fastest rate since the 1920s. At the same time, the monetary authorities also shifted from a quantitative easing (QE) strategy to its effective opposite, a quantitative tightening (QT) regime. When the economy was growing slowly and inflation was below the Fed's target, the central bank's purchase of fixed-income securities through QE increased liquidity in the system, putting downward pressure on interest rates. But the Fed is now tightening financial conditions by increasing the supply of Treasuries available to investors. QT has also helped to reverse the "risk-on" effects of QE, which occurred when many investors looking for higher yields moved into riskier assets. In short, when QT began, credit spreads widened, and equities fell.

None of this happened in a vacuum. The dramatic shift in monetary policy came amidst increasingly fraught geopolitical tensions that affected energy security not just in the European theater but around the entire world. We are in an era of economic, policy, and geopolitical adjustment, and the result is that investors are left grasping for new ideas that can protect them from a wide variety of unprecedented shocks to their portfolios. One of the central questions on investors' minds seems to be whether inflation has been primarily supply- or demand-driven and what the appropriate portfolio-management response to this complex set of macroeconomic indicators and influences should be.

Those who think the demand side of the equation is the more important factor point to the fiscal response to COVID-19 in the United States: stimulus checks, higher unemployment benefits, childcare tax credits, and Paycheck Protection Program (PPP) loans. If those were the primary reasons behind inflation—fiscal stimulus led to high savings led to excess demand—then the solution to inflation would seem to be "demand destruction," something the Federal Reserve (and other central banks) are trying to engineer through rate increases.

But it's not entirely clear whether that was the case. US and European inflation (**Exhibit 1**) over the past two years have been almost identical despite the fiscal response to COVID-19 (**Exhibit 2**) being double the size in the US relative to Europe. With a much more aggressive fiscal response in the US, both headline and core inflation should have been much higher in the US today than in Europe.

Exhibit 1: Root causes of inflation are hard to pinpoint: US and EU prices have been rising at a similar pace...



Source: Bloomberg, Apollo Chief Economist.

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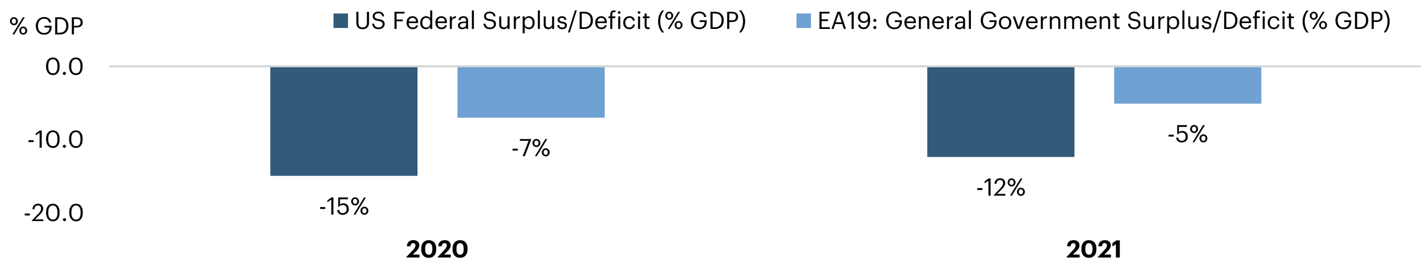
Exhibit 2: ...despite the fiscal response to COVID-19 being double the size in the US relative to Europe



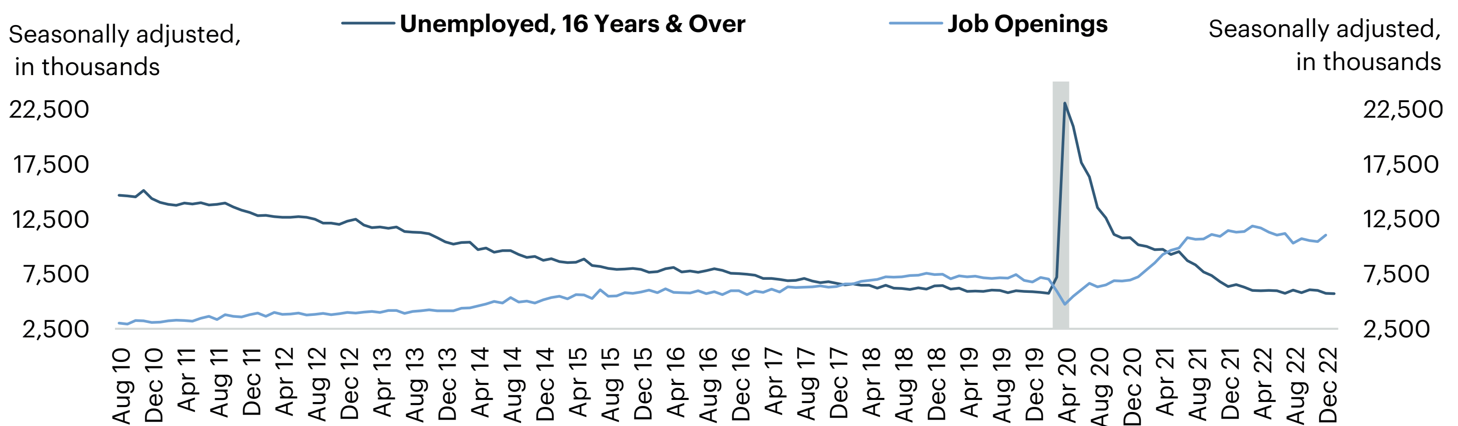
Source: Office of Management and Budget (OMB), European Central Bank (ECB), Haver Analytics, Apollo Chief Economist. Euro Area (EA) 19 countries include Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Slovakia, Slovenia, and Spain. Data as of April 26, 2022.

The similar path of inflation in the US and Europe strongly suggests that inflation has not been entirely driven by demand but at least partly by supply-chain problems associated with COVID-19 as well. Some of the sourcing issues for goods are already resolving themselves as supply chains ease. Indeed, recent data suggest that transportation costs are normalizing, as the costs of transport by ship, truck, and even air freight are coming down, although air freight rates are still more than double pre-pandemic levels.

That said, after an initial decline in inflation driven by supply chain improvements at year-end, upside risks due to demand have once again moved to the forefront of investors' minds. In December, most economists expected the Federal Open Market Committee (FOMC) to begin downshifting their rate hikes in the first quarter of 2023; that outlook has changed. We believe that the Fed is likely going to need to raise rates further and keep rates higher for longer to get inflation all the way back to the Fed's 2% target.

Indeed, with strong job growth (**Exhibit 3**)—reflected by a decline in the unemployment rate to the lowest level since 1969—it is beginning to look like hopes for a "soft landing" were too optimistic. The more likely "no landing" scenario is negative for markets because higher rates for longer increase the downside risks for equities and credit, particularly for tech and highly levered companies that will see higher interest payments for longer. In short, the no landing scenario brings back the volatile market action we saw in 2022 because it reintroduces uncertainty about inflation and about the Fed.

Exhibit 3: The US counts 11 million job openings and only 6 million unemployed



Source: Bureau of Labor Statistics (BLS), Haver Analytics, Apollo Chief Economist.

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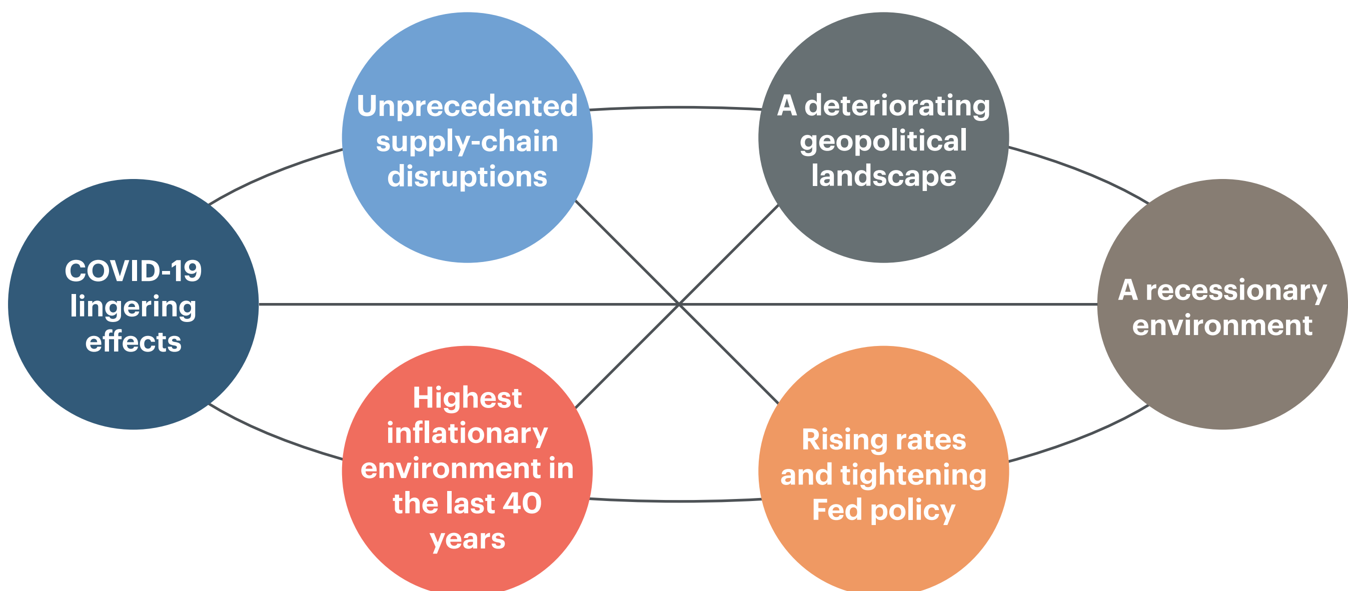
In short, investors should not expect interest rates to head back to zero any time soon. The fed funds rate, which is expected to peak around 5% in June, is likely to find a new equilibrium around 2.5%, instead of the 0% it sat at between 2008 and 2020.[1] This permanent increase in the cost of capital has a wide range of consequences for corporate America and financial markets, including how to think about credit spreads and stock prices, in particular technology and growth.

As we continue to grapple with this complex, multi-faceted scenario (**Exhibit 4**), one thing is clear: The growth investing approach that has characterized the industry in the last 15 years will need to adapt. We believe the current market backdrop is particularly favorable for a value-focused investment strategy.

We believe in a nuanced and differentiated approach to infrastructure investing, centered on a disciplined investment philosophy that focuses on value, bespoke structuring, and attractive positioning in the capital structure (across asset classes and deal types).

Exhibit 4: The macro environment in 2022 was one of the most challenging in years



Source: Apollo Analysts.

1. Source: Apollo Chief Economist.

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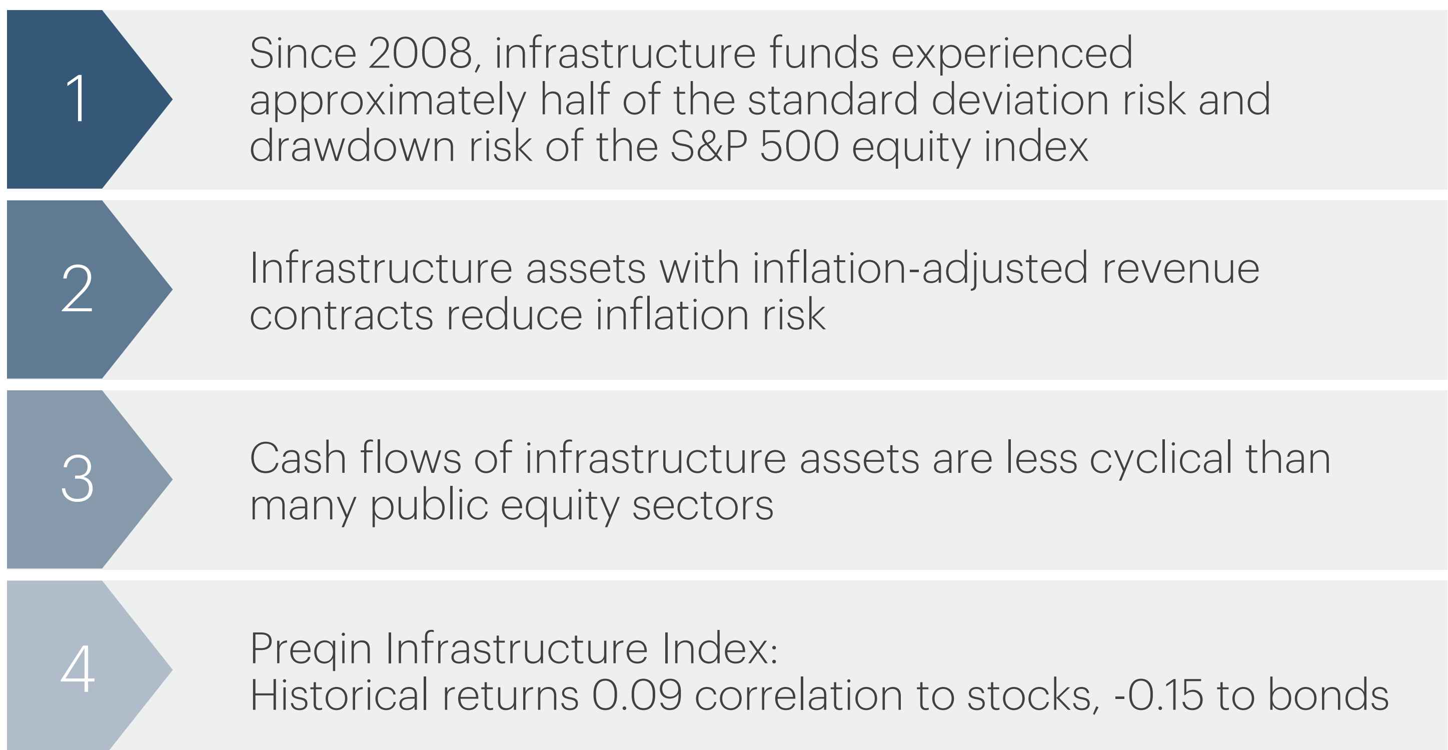
The fundamental case for infrastructure

Infrastructure is fast becoming a more visible part of alternatives portfolios because of the unique and compelling attributes of the asset class: upside potential married to downside protection.

In our view, the infrastructure sector currently represents an attractive, downside-protected asset class on a risk-adjusted basis, given that investments are typically supported by hard assets with long, useful lives and stable, inflation-protected cash flows. Due to the long-term contracted nature of many infrastructure investments, they generally display revenue visibility with strong free cash-flow generation, as well as contractual agreements with creditworthy counterparties, including larger corporations and government entities. Infrastructure are also capital-intensive assets that can be natural monopolies, lending them pricing power directly or inherent to a regulated pricing regime. Infrastructure returns are also generally inclusive of a cash yield, in addition to capital appreciation, which is beneficial for investors seeking income as well as total return.

Infrastructure investments typically have low correlation with other assets classes and economic output. As measured by the Preqin Infrastructure Index, the asset class has shown very low correlation to key public asset classes, with historical returns revealing a 0.09 correlation to stocks (as measured by the S&P 500 Index) and -0.15 to bonds (as measured by the Bloomberg US Aggregate Total Return Value Unhedged USD) during the period spanning from January 2008 to September 2021. Asset performance is typically de-linked from market environments due to inelastic demand as infrastructure products provide essential services that have functional importance to economies and stakeholders in everyday life, thereby providing resilience during economic downturns and periods of instability (**Exhibit 5**).

Exhibit 5: Infrastructure investing can offer downside protection with low correlation to other asset classes



Source: Preqin, Bloomberg. Quarterly data from January 2008 to September 2021. Investments include S&P 500 equity index for stocks, Bloomberg US Aggregate Total Return Value Unhedged USD for fixed income, and Preqin Infrastructure Index for infrastructure.

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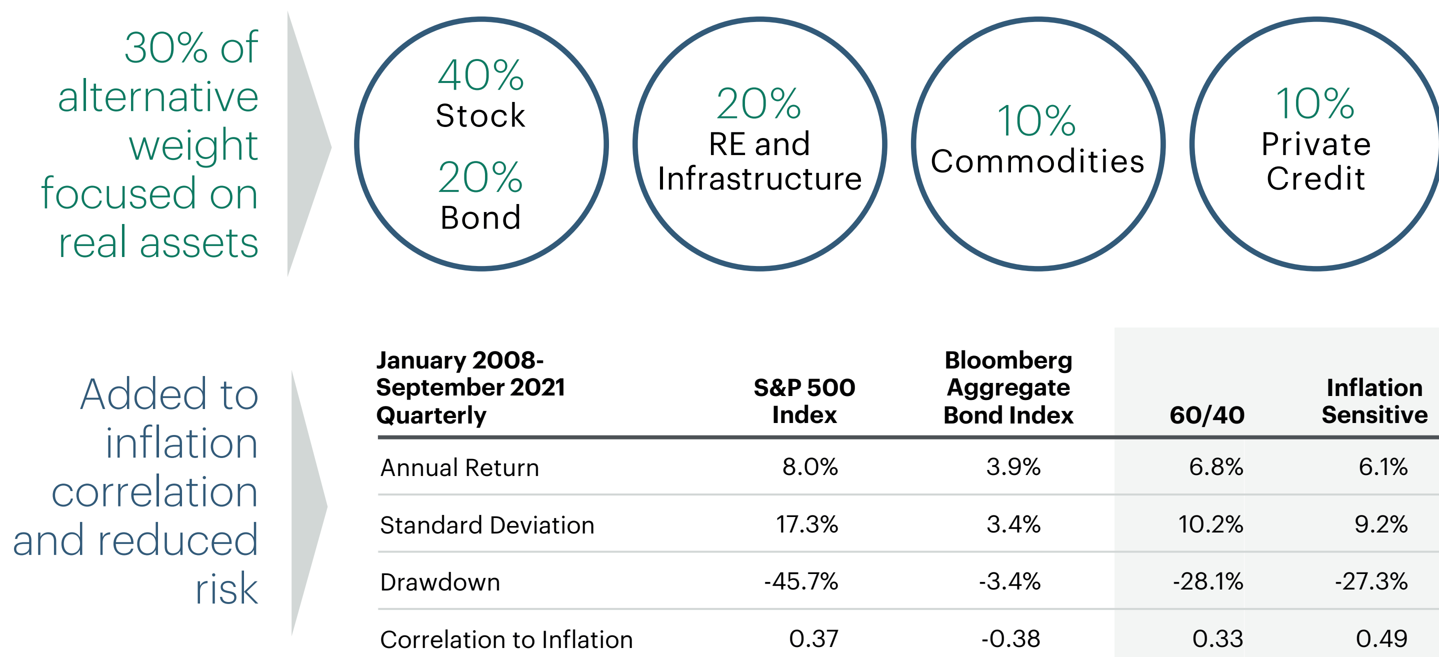
Additionally, infrastructure investing is supportive of a broader market shift towards sustainability. Our multi-pronged focus on bolstering the accelerated global energy transition and decarbonization, strengthening the circular economy, enhancing connectivity through digital infrastructure, and connecting economies through the global supply chain and sustainable mobility rests on top of a leading and longstanding Environmental Social & Governance (ESG) program. In our view, ESG considerations should and can be integrated into the life cycle of any investment, including in the selection and monitoring and potential benefits of infrastructure investments, from lending to operations.

A late 2022 report by the Organization for Economic Cooperation and Development (OECD), *Long-term investing of large pension funds and public reserve funds,*[2] supports our contention that infrastructure is taking an increasing portion of investors' asset allocation pie.

In its annual survey of large pension funds (LPFs) and public pension reserve funds (PPRFs), the OECD found that the asset class that saw the largest increase in 2021 allocations was private equity, which grew on an average 41.4% from 2020 for LPFs and 48.1% for PPRFs. Unlisted infrastructure investment increased by 25.2% on average for LPFs and 5.1% for PPRFs. Infrastructure investment in the form of unlisted equity, listed equity and debt was $211.8 billion, representing 2% of the total assets under management of the entire survey population. Forty-four funds indicated to have invested in unlisted infrastructure equity. Twenty-one funds reported to have invested in listed infrastructure equity, with an average of 3.9% of their total investment. Thirty-one funds reported having infrastructure debt, an average of 3.8% of total investments.[3]

On a practical level, a recent analysis by the Apollo Academy makes the case for adding inflation-sensitive assets to an institutional portfolio. As shown in **Exhibit 6**, between January 2008 and September 2021, a typical 60/40 portfolio—60% in public equities, 40% in public fixed income—had an annual return of 6.8%, a standard deviation of 10.2%, and 0.33 correlation to inflation.

Exhibit 6: Compared to a 60/40 public stock-bond portfolio, an inflation-sensitive portfolio with infrastructure can offer reduced volatility and inflation risk



January 2008-September 2021 Quarterly	S&P 500 Index	Bloomberg Aggregate Bond Index	60/40	Inflation Sensitive
Annual Return	8.0%	3.9%	6.8%	6.1%
Standard Deviation	17.3%	3.4%	10.2%	9.2%
Drawdown	-45.7%	-3.4%	-28.1%	-27.3%
Correlation to Inflation	0.37	-0.38	0.33	0.49

Source: Bloomberg, Preqin, NCREIF. Data accessed June 2022. Quarterly data from January 2008 to September 2021. Investments include S&P 500 equity index for stocks, Bloomberg US Aggregate Total Return Value Unhedged USD for fixed income, Preqin Private Credit for private credit, Bloomberg Commodity Index for commodities, Preqin Infrastructure for infrastructure, and NCREIF Fund Index Open End Diversified Core (ODCE) for private real estate. 60/40 portfolio is 60% stocks, 40% fixed income. Inflation-sensitive portfolio is 40% stocks, 20% fixed income, 10% private credit, 10% infrastructure, 10% commodities, and 10% real estate.

2. OECD (2022), Long-term investing of large pension funds and public pension reserve funds, OECD Publishing, Paris, https://doi.org/10.1787/809eff56-en.
3. Idem.

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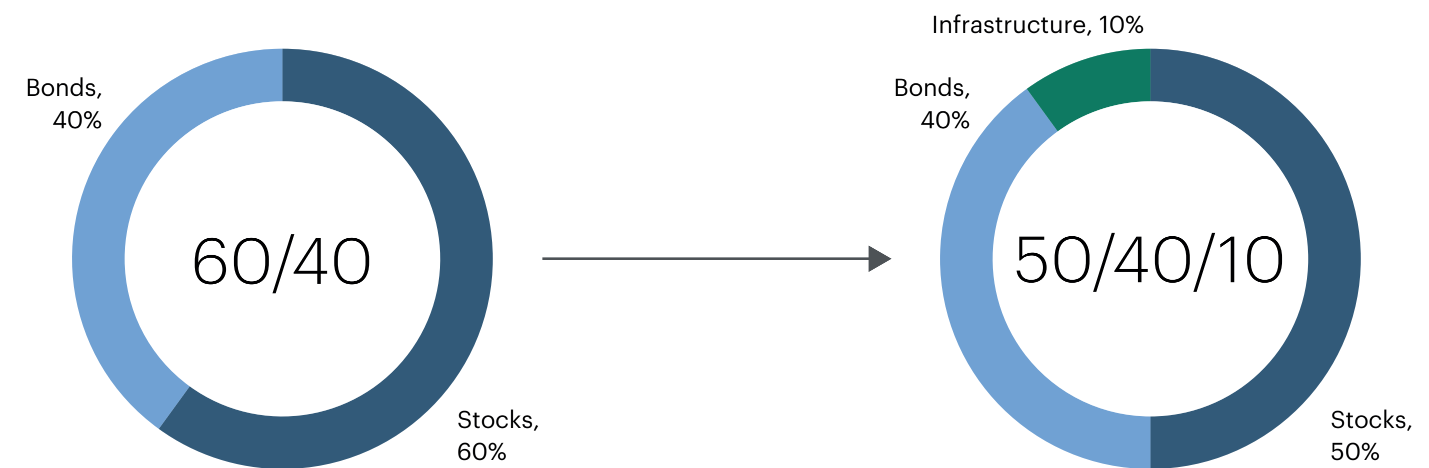
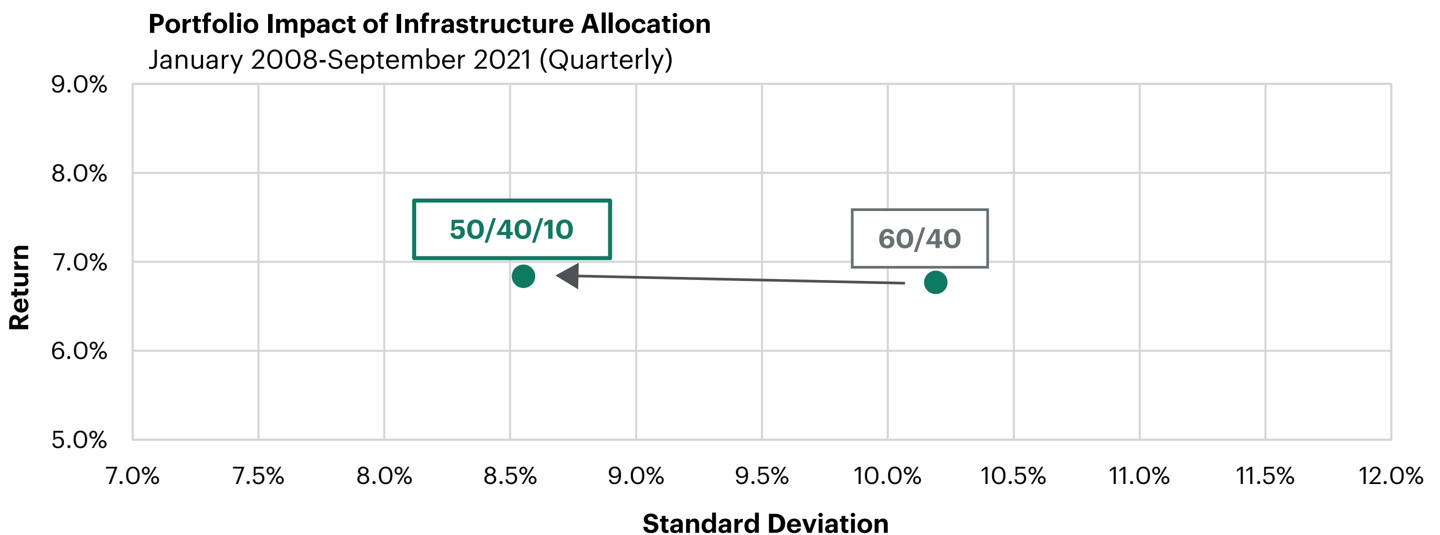
An inflation-sensitive portfolio, on the other hand—40% stocks, 20% fixed income, 10% private credit, 10% infrastructure, 10% commodities, and 10% real estate—delivered comparable 6.1% annual returns but with lower volatility (a 9.2% standard deviation) and higher correlation (0.49) to inflation. In other words, the inflation-sensitive portfolio reduced both volatility and inflation risk versus the 60/40 portfolio, with real assets playing a crucial role in delivering those enhancements.

A separate Apollo Academy analysis looked specifically at the impact of adding infrastructure investments to a 60/40 portfolio. The exercise shifted 10% of the invested capital out of public stocks and re-deployed it to private infrastructure. **Exhibit 7** illustrates the results: Between January 2008 and September 2021, the annual return of both portfolios was 6.8%, but the volatility of the infrastructure-enhanced portfolio declined, from 10.2% for the traditional 60/40 allocation to 8.6% when an infrastructure allocation was included.

Exhibit 7: Historically, the addition of an infrastructure allocation enhanced risk-adjusted returns





Source: Preqin, Bloomberg. Data accessed June 2022. Quarterly data from January 2008 to September 2021. Investments include S&P 500 equity index for stocks, Bloomberg US Aggregate Total Return Value Unhedged USD for fixed income, Preqin Infrastructure Index for infrastructure. 60/40 portfolio is 60% stocks, 40% fixed income. 50/40/10 portfolio is 50% stocks, 40% fixed income, and 10% infrastructure.

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Powerful tailwinds supporting infrastructure investment today

We believe the current environment presents an attractive set of tailwinds for infrastructure investing.

First, we expect credit spreads are likely to continue widening for a variety of reasons, including the growing supply of Treasuries hitting the market as the Fed unwinds its balance sheet. Before the pandemic, net issuance of Treasuries was around $500 billion a year, but in 2023 that number is forecast to rise to $1.5 trillion, with $1 trillion coming from the budget deficit and $500 billion as a result of the Federal Reserve shrinking its holdings of US Treasuries.[4] In sum, there is upward pressure on long-term interest rates not only for cyclical reasons (i.e., inflation) but for structural reasons as well (i.e., the bigger budget deficit and the Federal Reserve's QT program). As the overall appetite for risk stays subdued, infrastructure assets' low correlation to the market cycle and inflation-hedging traits can be especially attractive to investors looking to deploy capital today.

In addition to macroeconomic factors, large new federal infrastructure spending initiatives also support broad-based interest and investment in the sector. The Biden Administration's two-pronged infrastructure spending strategy, via the Infrastructure Law and Inflation Reduction Act, will catalyze new and ambitious large-scale projects.

The Bipartisan Infrastructure Law, passed in November 2021, represents the most significant investment in the nation's infrastructure since President Eisenhower created the Interstate Highway System, with $1 trillion earmarked for investment in transportation, broadband, and utilities, including the nation's roads and bridges ($110 billion), railroads ($66 billion), the power grid ($65 billion), broadband ($65 billion), water infrastructure ($55 billion), cybersecurity and climate change ($50+ billion), public transit ($39 billion), airports ($25 billion), and ports ($17 billion).

The Inflation Reduction Act, which President Biden signed into law in August 2022, includes roughly $390 billion in projected spending on Climate Provisions (**Exhibit 8**). The energy spending package can enhance the investment opportunity set supporting the energy transition. The duration of many of the programs, such as 10-year renewable energy tax credits, will likely provide unprecedented visibility to regulatory support, which has historically been a hindrance for investment in the sector.

Underpinning the above Federal spending initiatives is the pressing global need for infrastructure upgrades that dwarfs even these unprecedented and ambitious spending plans. Through 2040, the estimated global need for infrastructure investment is $94 trillion. Based on projected infrastructure spending, this represents a total funding gap of $15 trillion in order to keep pace with projected growth.[5] Incrementally, there is an estimated $3.4 trillion needed to achieve global sustainable development goals established by the United Nations.[6]

Although a portion of this will continue to be funded via government and public sources, we believe the availability, efficiency and flexibility of private capital will need to play an ever-increasing role. While public investment is expected to continue to increase with global economic growth as a fixed percentage of GDP, many G20 countries have reduced infrastructure spend since the global financial crisis of 2008. Moreover, it is estimated that more than a third of global infrastructure investment has historically been spent inefficiently due to market failures and supply chain bottlenecks.[7] Apollo believes this represents an opportunity to take advantage of market dislocation and inject efficient capital where other investors—both public and private—have failed to execute.

4. Source: Congressional Budget Office (CBO), Federal Reserve Board (FRB), Haver Analytics, Apollo Chief Economist. Note: Estimate of QT includes SOMA redemptions with cap assumed $60 billion per month in 2023. CBO data as of May 26, 2022, and FRB data as of December 2, 2022.
5. Source: Global Infrastructure Outlook from Global Infrastructure Hub, 2020. Note: An earlier version of this paper cited an estimate by Global Infrastructure Hub of a total funding gap of more than $88 trillion between the global need for infrastructure spending through 2040 and projected spending. The $88 trillion (later revised to $94 trillion) was, in actuality, the total need for infrastructure spending and not the funding gap, which is $15 trillion.
6. Source: Global Infrastructure Outlook from Global Infrastructure Hub, 2020.
7. Source: McKinsey Global Institute, 2017.

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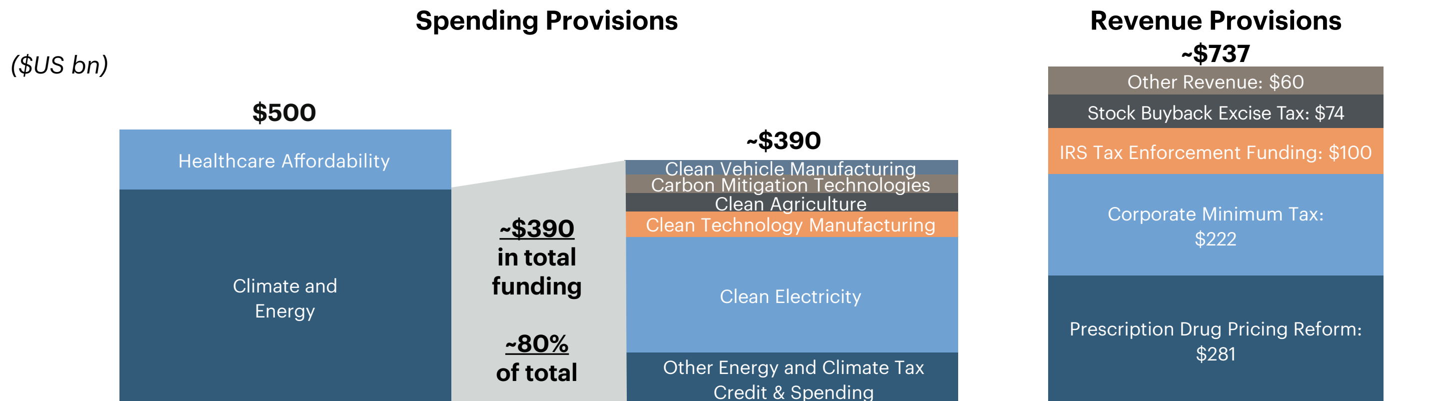
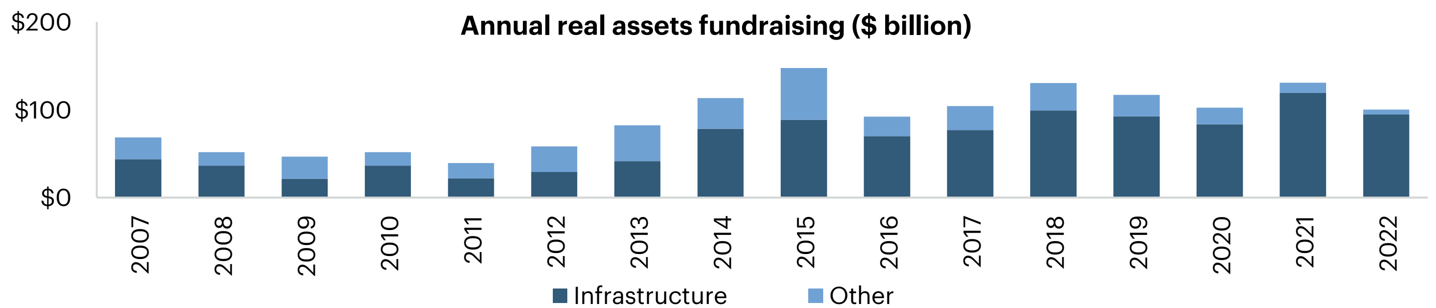
Exhibit 8: The Inflation Reduction Act is one of the most significant pieces of climate legislation ever enacted



Source: Senate Democratic Leadership, U.S. Senate Committee on Environment and Public Works, Apollo estimates based on CBO guidance for related BBB provisions.

Finally, the asset class has strong momentum, with large amounts of capital, especially from institutional investors (as described previously), pouring into infrastructure. As shown in **Exhibit 9**, real assets fundraising has exceeded $90 billion each year since 2014, with 70%-plus of that total invested in infrastructure. The Limited Partner community continues to value the asset class's intrinsic resilience and, in particular, its inflation linkage. In a recent survey, investors cited high inflation and interest rate hikes as the top factors likely to influence investment performance over the next 12 months. More than half reported making allocations to infrastructure, making it the second-most popular alternative asset class after private equity.[8]

Exhibit 9: Infrastructure makes up the majority of real assets fund raising



Source: Pitchbook. Data from January 2007 to September 2022. Other real assets include metals and mining, oil and gas, and timber and agriculture.

The competition for deals and projects is also increasing, making it even more important for investors to be very selective when choosing investment managers in the space. According to a study by analytics firm Pitchbook, there was some $700 billion invested in real assets in 2021, while the dry powder—or capital committed but still waiting to be deployed by managers—was a hefty $320 billion, accounting for almost half of the invested total (**Exhibit 10**).

8. Source: Infrastructure Investor, "Perspectives 2023," February 2023.

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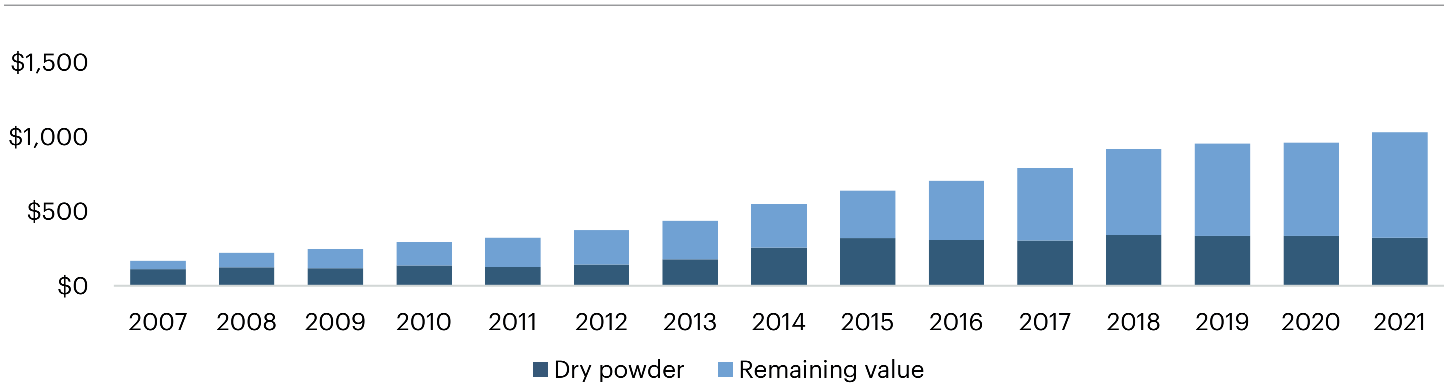
Exhibit 10: Real assets have $320 billion in dry powder waiting to be deployed



Source: Pitchbook. Data accessed July 2022. Annual data 2007-2021.

But... today's market is volatile and complex

We believe that the current market backdrop is different than anything most investors have seen before and will test the inflation, rate-sensitive, and other economics characteristics of any infrastructure portfolio.

We believe a flexible investment strategy works well across cycles but performs particularly well during periods of market dislocation. The toolkit is predicated on three primary types of investment: equity buyouts, corporate carve-outs, and structured solutions (**Exhibit 11**).

Exhibit 11: An all-weather infrastructure investment approach utilizes a variety of disciplines

EQUITY BUYOUTS

- Majority or leading stakes in **traditional infrastructure assets**.
- **Proactive approach to value creation**; ability to leverage operating expertise to drive value and enhance performance.
- **Platforms and consolidation opportunities**.
- High-quality assets / essential service businesses with **stable and/or contracted cash flows**.

CORPORATE CARVE OUTS

- **Bilateral negotiations with a larger corporate parent** to extract a business or create a standalone enterprise.
- Seek to uncover **below-the-radar or misunderstood opportunities** that are undervalued by the market.
- Potential to **achieve higher returns than typical brownfield assets**.

STRUCTURED SOLUTIONS

- Mezzanine and holdco loan structures; preferred and structured equity.
- Ability to **secure further downside protection**.
- Pursue opportunities resulting from **market dislocation or regulatory change**.

Source: Apollo Global Management.

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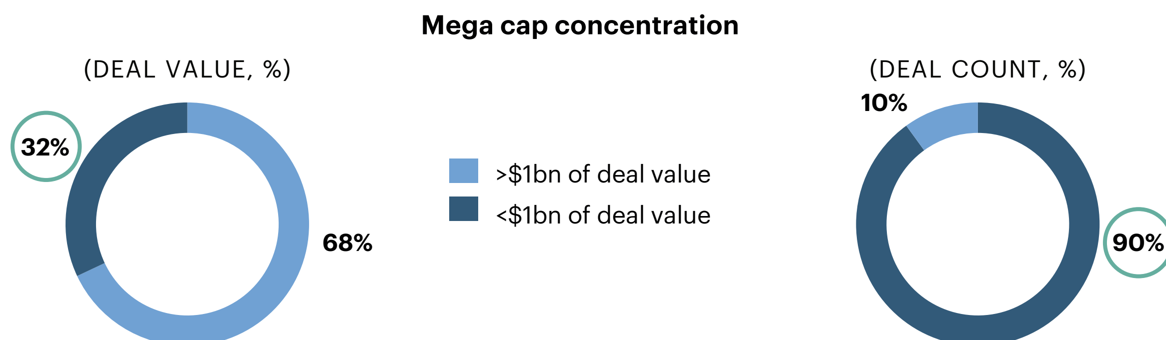
We believe that the middle-market—which Apollo defines as investments between $100 million to $1 billion of total equity, or up to $2 billion of total enterprise value per transaction—provides opportunities today to invest in franchise assets while offering significant downside protection. Specifically, we believe the approach should aim for preservation of capital through pricing discipline, conservative underwriting, preferential liquidity features, creative structuring, current-yield components, and collateralization by significant asset value. We think of structuring as a "must have" to unlock differentiated deal flow with downside protection and upside optionality while "trading complexity for value," especially in times of economic dislocation.

We see the middle-market as a wider hunting ground, more fragmented and more prone to bilateral sourcing, especially at a time when the large capitalization space is awash in capital.

All-told, roughly 90% of all infrastructure transactions (by number) over the past decade have been in the middle-market. With some 8,000 middle-market assets traded in the last 10 years, the opportunity set for a platform targeting the middle-market is substantial (**Exhibit 12**). Despite compelling statistics, several investors have shifted their focus to larger transactions.[9] Managers in the large-cap space, defined as those seeking $1 billion+ in equity check-size investments, have increased their share of dry powder from ~14% in 2017 to ~40% today, meaning there is significantly more capital to be deployed in larger transactions, driving up competition for a finite pool of assets.[10] With a disproportionate amount of capital flowing into large-cap infrastructure, and therefore chasing an increasingly limited opportunity set, we believe that the current market environment is an attractive time to invest in the lower end of the infrastructure market.

Exhibit 12: Infrastructure investing has been concentrated in the large-cap space over the past decade, leaving ample opportunity for broad platforms targeting the middle-market.



Source: Apollo Analysts as of October 2022, Infrastructure Investors "LP Perspectives", February 2022.

On top of this, a historical analysis (**Exhibit 13**) points to the fact that sponsor-led, small/mid-cap transactions have been more resilient in down markets where financing options are limited or shut, compared to large caps.

9. Source: Preqin as of December 2022.
10. Source: Preqin as of December 2022.

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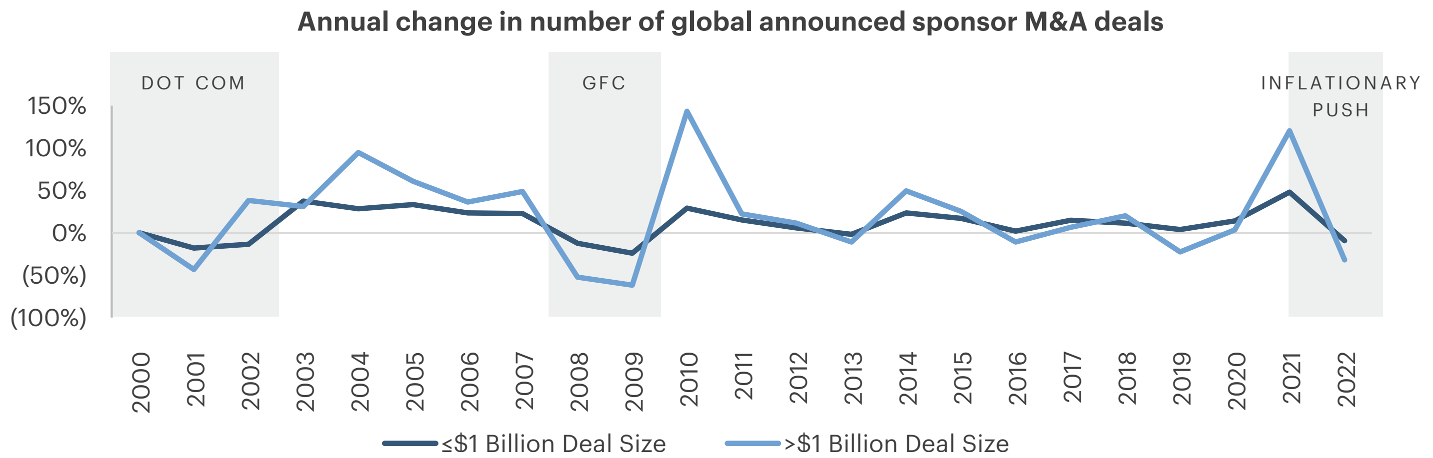
Exhibit 13: Financing availability has more of an effect on large-cap deals



Source: Goldman Sachs, Thomson SDC as of September 2022. 2022 reflects an annualized estimate base on the monthly data from January to September.

Equity Buyouts

The ability to make large and timely equity buyouts is crucial to a flexible infrastructure investment strategy. While "purchase price matters," we believe it is the application of value-creation expertise to infrastructure assets that unlocks the possibility of upside opportunities through operational enhancement. As an example, Apollo targets target platforms and other consolidation opportunities, specifically high-quality assets in essential services businesses with stable and/or contracted cash flows.

Corporate Carve-Outs

A corporate carve-out is a means to trade complexity for value by identifying infrastructure assets within larger corporate parents and acquiring them at attractive valuations. This typically requires creating new corporate structures around the business, including building out a management team and corporate financial structure, to enable it to thrive as a stand-alone company or asset. These are labor- and time-intensive transactions that require deep industry knowledge, patience, and creativity to unlock value that has largely been overlooked. Importantly, because of the highly negotiated nature of these transactions, it is often difficult for the seller to run a competitive process, which allows the relatively small number of capital providers capable of executing a carve-out to achieve attractive purchase prices.

Structured Solutions

Accessing infrastructure through structured solutions can allow capital providers to take advantage of complex situations through a flexible investment approach. The goal is to achieve strong risk-adjusted rates of return by flexibly investing across the capital structure, preserving upside in each instance while narrowing the band of outcomes in the base case. For its part, Apollo relies on its deep capital markets expertise and structuring capabilities to pursue preferred and structured equity investments, convertible instruments, senior secured and unsecured debt, "holdco" loans and other structured solutions, which can offer strong downside protection with equity-linked or equity-like upside and strong governance.

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Conclusion

The end of the unprecedented monetary expansion of the past 14 years made 2022 a time of jarring transition for investors. The year started with low rates, loose monetary policy, and benign inflation and ended with high inflation, rising rates, and tightening monetary policy. Along with that change came lower asset prices and higher volatility in public markets, and investors expanded their priorities from a single-minded focus on upside opportunity to include downside protection.

Infrastructure can offer several compelling attributes that make it an obvious consideration for investors seeking to deploy capital in these challenging times, including its low correlation to market cycles and its characteristic protections from inflation. Along with significant increases in government spending and capital-raising momentum in the sector, this makes the asset class singularly attractive for investors seeking to continue to deploy capital during this period of dislocation.

While infrastructure has provided portfolio resilience in recent years, investors ought to consider a different playbook that provides downside protection in a time of market turmoil.

At Apollo, we believe that a nuanced infrastructure investment strategy with a disciplined, price-conscious investing mindset—purchase price matters—is more crucial than ever. Additionally, we believe a flexible investment strategy works well across cycles but performs particularly well during periods of market dislocation. The toolkit is predicated on three primary types of investment: equity buyouts, corporate carve-outs, and structured solutions.

Finally, we see the middle-market as the most fertile ground for opportunity, especially at a time when the large-capitalization space is awash in capital.

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About the authors

Torsten Sløk
Partner, PhD, Apollo Chief Economist

Torsten Sløk joined Apollo in August 2020 as Chief Economist, and he leads Apollo's macroeconomic and market analysis across the platform.

Prior to joining Apollo, Torsten worked for 15 years as Chief Economist at Deutsche Bank where his team was top ranked in the annual Institutional Investor survey for a decade. Prior to joining Deutsche Bank, Torsten worked at the IMF in Washington, DC and at the OECD in Paris.

Torsten has a PhD in Economics and has studied at the University of Copenhagen and Princeton University.

Vittorio Lacagnina
Partner, Institutional Client & Product Solutions

Vittorio Lacagnina is Partner in the Institutional Client & Product Solutions group at Apollo where he leads capital formation for Infrastructure.

Prior to joining Apollo, Vittorio was Managing Director & Head of Business Development, Private Infrastructure at Partners Group. Vittorio has 25 years of industry experience across a variety of senior investment, advisory and capital formation roles with QIC, SteelRiver Infrastructure, Babcock & Brown and DEPFA Bank. Vittorio began his career in the Investment Banking Division of Goldman Sachs where he acquired relevant transaction and coverage expertise across the Americas and Europe.

Vittorio graduated with a first-class BA (Hons) in international business from the European Business School, London.

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