NORTHERN TRUST

CAPITAL MARKET ASSUMPTIONS

10-YEAR OUTLOOK: 2024 EDITION

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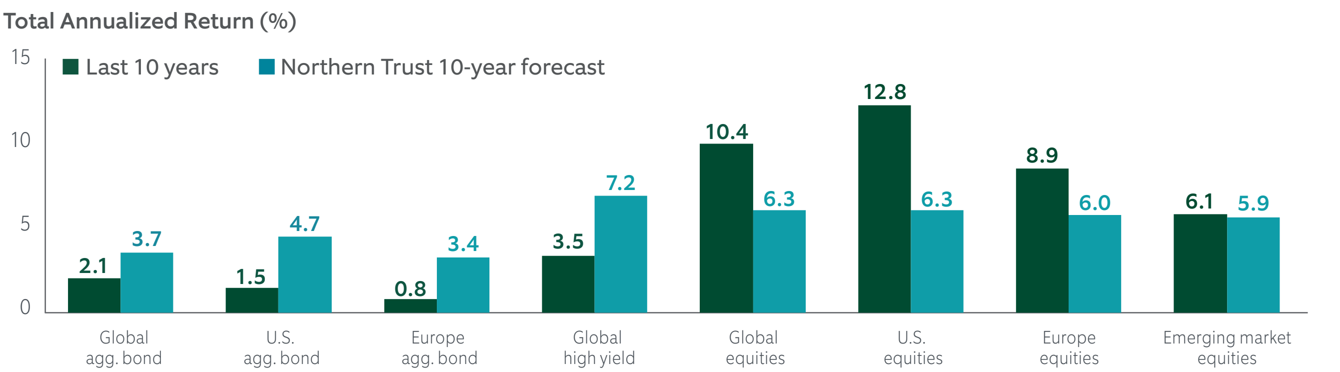
Higher interest rates and reasonable risk asset valuations make for a decent starting point for financial market prospects, but **Growth Restraints** and **Geopolitical Fault Lines** will likely keep returns modestly below long-term historical averages. The ongoing **Inflation Adaptation** to new and lingering price pressures may be facilitated by **Central Bank Concessions** that allow for modestly higher structural inflation.

While not returning to the past decade's ultra-easy monetary policy, central bankers probably will accept modestly above-target inflation created by necessary but costly efforts to regionalize supply chains and execute **A Sustainable Green Transition** globally. We think technology remains an economic force for good, but the most exciting technologies (think AI) require time and investment first. Here (and elsewhere), **Private Matters** may increasingly supplant banks and public markets in funding key economic initiatives.

EXHIBIT 1: THE BONDS ARE BACK IN TOWN

Higher starting point fixed income yields make for a less compelling equity risk premium versus the past 10 years.



Source: Northern Trust Asset Management, Bloomberg. Annualized return data in local currency from June 30, 2013 to June 30, 2023. Index performance returns do not reflect any management fees, transaction costs or expenses. It is not possible to invest directly in any index. Past performance is not indicative of future results.

2024 THEMES & ASSET CLASS RETURNS OVERVIEW

Our 10-year themes identify the trends we see affecting the markets and economy over the next decade, providing the foundation for our asset class outlooks.

Growth Restraints

Economic growth — already restrained by debt and demographic issues — will also be handcuffed by necessary, but costly, investments to deal with geopolitical uncertainty and climate change. AI may unshackle growth but needs large investments (and time) before it can support the global economy.

Geopolitical Fault Lines

The deepening U.S.-China strategic rivalry has elevated geopolitical risks. Unlike most geopolitical events of the post-Cold War era, the risks in this new regime can manifest in ways that alter fundamentals. Even seemingly stable geopolitical tectonics could shift abruptly — and should be factored into risk-asset valuations.

Inflation Adaptation

While global economic growth is back to its slow growth ways, inflation is taking longer to settle in. Pressures from tight labor markets, regionalization and higher commodity prices will likely more than offset technology's disinflationary promise. Investors, consumers and policymakers must adapt.

A Sustainable Green Transition

The green transition is still a go, fueled by a desire to decarbonize as well as improve energy security. But we doubt the transition will be easy given the vast amounts of financing and natural resources required. A sustainable path — considering both economic and environmental issues — may be a challenge.

Central Bank Concessions

Setting monetary policy is increasingly challenging in an environment of structural inflationary forces. Over time, as pressure builds for central banks to prioritize economic well-being over chasing an arbitrary inflation target, they will be forced to concede slightly above-target inflation.

Private Matters

Private markets continue to grow — providing access to investment opportunities that public markets can't (or won't), supported by improved liquidity from a growing funding infrastructure. As a result, private investments are primed to spread wider and deeper in investor portfolios.

Fixed Income

Higher starting-point yields drive the improved investment grade bond return forecasts, but capital appreciation may be limited as interest rates remain elevated. High yield bonds can benefit from elevated nominal economic growth expectations, likely capping default rates and spread widening.

Equities

The outlook is caught between the competing forces of solid revenue growth (fueled by still-strong nominal economic growth) and falling profit margins (under pressure from higher input and financing costs). Acceptable absolute returns mask a less acceptable return premium over cash.

Real Assets

Although real assets have given back ground to broader equities more recently, the new regime of elevated and uncertain inflation should provide ongoing support. Natural resources stocks should benefit from exploration and production underinvestment as well as green transition commodity demand.

Alternatives

We think private investments will continue to provide attractive return premiums over public markets, benefiting more recently from increased liquidity options. High return dispersion across both private investments and hedge funds requires effective manager selection and due diligence processes.

GROWTH RESTRAINTS

The next 10 years will likely reflect a transition from recent economic disruptions (i.e., the pandemic, war in Ukraine) to longer term structural restraints on growth. We expect below-trend global growth as elevated geopolitical risk and pandemic-era reminders diversify and reroute the supply of key goods and technologies away from strategic adversaries, while momentum around energy security and the green transition comes with intermediate-term costs. Directing capital investment to replace existing capacity in supply chains and energy sources may crowd out more economically additive spend.

> The next 10 years will likely reflect a transition from recent economic disruptions to longer term structural restraints on growth.

Structural upward pressure on inflation likely will lead to *Central Bank Concessions* (p. 5), though markets and economies will have to adapt to higher interest rates and a reduction in willingness for central banks to “rescue” wavering economies. Higher financing costs complicate elevated debt levels, as interest cost burdens rise while the low-rate stock of debt is gradually refinanced. Also, the slow-moving demographics headwind remains a challenge for most of the developed world and especially China. While “younger” regions like India could earn a demographic dividend, realizing such benefits will require careful execution.

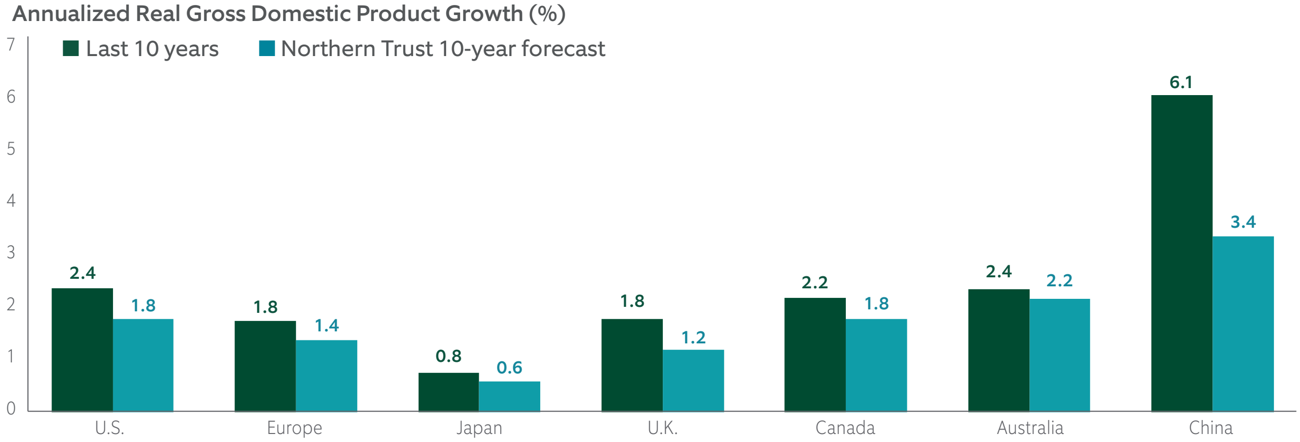
An offset to these pressures of currently inestimable magnitude is accelerating transformation underway in technology — specifically artificial intelligence (AI), but also areas like 5G and other digital innovation. Economic gains should be reaped via enhanced productivity from AI and the creation of new growth avenues. Still, the pace of AI adoption faces limitations (computing requirements, regulatory pushback), suggesting the degree to which these new technologies ultimately feed through to economic growth numbers can be highly variable.

We forecast a 2.4% real annualized growth rate for the global economy over the next 10 years, an underwhelming expansion relative to the prior decade. We project most regions will undershoot prior-10-year growth levels as the forces impeding growth are mostly global. Some issues are more acute in certain areas (demographics and debt issues in China, need for energy investments in Europe), and so it is in those regions where we expect to see the most pressure.

EXHIBIT 2: NEW WORLD RESTRAINTS

We expect several restraints to lead to below-trend real economic growth levels.

Annualized Real Gross Domestic Product Growth (%)



Source: Northern Trust Asset Management, Bloomberg. Data from March 31, 2013 to March 31, 2023. Historical trends are not predictive of future results.

INFLATION ADAPTATION

Over the next 10 years, we expect the developed-market annualized rate of inflation to come in at 2.4%.

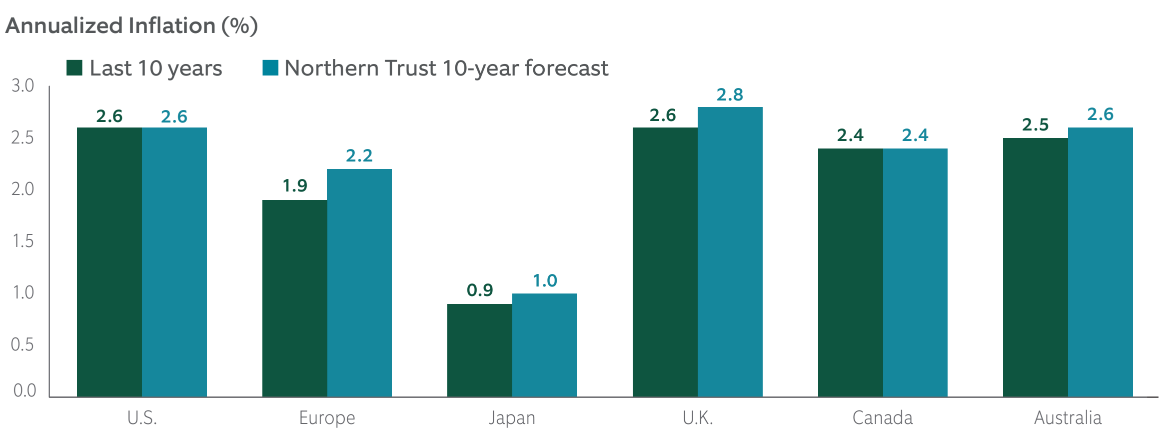
In seesaw fashion, many of the same factors creating *Growth Restraints* for real gross domestic product (GDP) will simultaneously keep upward pressure on global inflation. Economic actors are opting to sacrifice some trade efficiencies to secure long-run stability, and with *Geopolitical Fault Lines* (p. 6) set to worsen in our view, duplicative production efforts in areas of critical technologies and inputs (e.g., semiconductors) should continue to lead to higher prices. Similar pressures are inherent in the green transition, wherein clean energy solutions should eventually lead to longer term stability (and potentially lower prices), but not without a sustained period of higher commodity prices first (see p. 7). Partially offsetting these inflationary forces is the extent to which artificial intelligence and other tech advancements lead to more efficient production. But on the labor front the jury is still out, as companies may choose to reallocate any job-related savings toward non-automatable growth areas, resulting in both higher sales and higher costs.

Over the next 10 years, we expect the developed-market annualized rate of inflation to come in at 2.4%. While a moderation from the elevated levels of recent years, this leaves inflation above the 2% level targeted by most central banks. We forecast 2.6% for the U.S., with Europe lower at 2.2%. We see more downside risk to prices in Europe given more direct exposure to China, where we expect inflation to be softer (2.2%) due to an unconstructive growth outlook overall.

We anticipate a world of *Inflation Adaptation* in which investors and central banks must adapt to prices settling at levels slightly above target levels. As we discuss in the next section, we expect central banks will concede to inflation just above target levels. In turn, investors will likely maintain a slightly higher inflation risk premium — a support for higher interest rates and even elevated equity market volatility at times. But slightly elevated inflation is not entirely negative for risk-taking. Barring a de-anchoring of inflation expectations, *Central Bank Concessions* (p. 5) should help offset some of the interest rate pressures, while modestly elevated inflation can support nominal economic growth that feeds into corporate revenues.

EXHIBIT 3: FROM RECALIBRATION TO ADAPTATION

We expect the world will need to adapt to inflation that settles slightly above central bank targets.



Source: Northern Trust Asset Management, Bloomberg. Data from March 31, 2013 to March 31, 2023. All regions use headline Consumer Price Index as the inflation metric. Historical trends are not predictive of future results.

CENTRAL BANK CONCESSIONS

Divergence between the outlook for economic growth and inflation is creating a challenging environment for central banks. Structural forces associated with demographic trends, debt dynamics, the green transition and regionalization are simultaneously holding back economic growth and pushing inflation up (*Growth Restraints, Inflation Adaptation*). Faced with the reality that these forces are beyond central bank control, we expect monetary policymakers to concede some ground and allow for modestly above-target inflation. Not doing so could be too costly in terms of lost economic growth and may open them up to political criticism regarding their somewhat arbitrary inflation targets.

For investors, such a concession may be important to consider when assessing the financial market outlook and building investment portfolios. At a minimum, it could result in modestly lower policy rates than the inflation regime would normally dictate. At a maximum, it removes central banks as the center of attention for financial markets. Of course, that last part cuts both ways. Central banks may not hold the markets hostage with hawkish commentary and overly tight monetary policy, but nor would they provide the "central bank put" to markets when times get tough. The proverbial monetary flood is therefore still a thing of the past, and from the perspective of the global economy and financial markets, conditions likely will continue to resemble something of a drought.

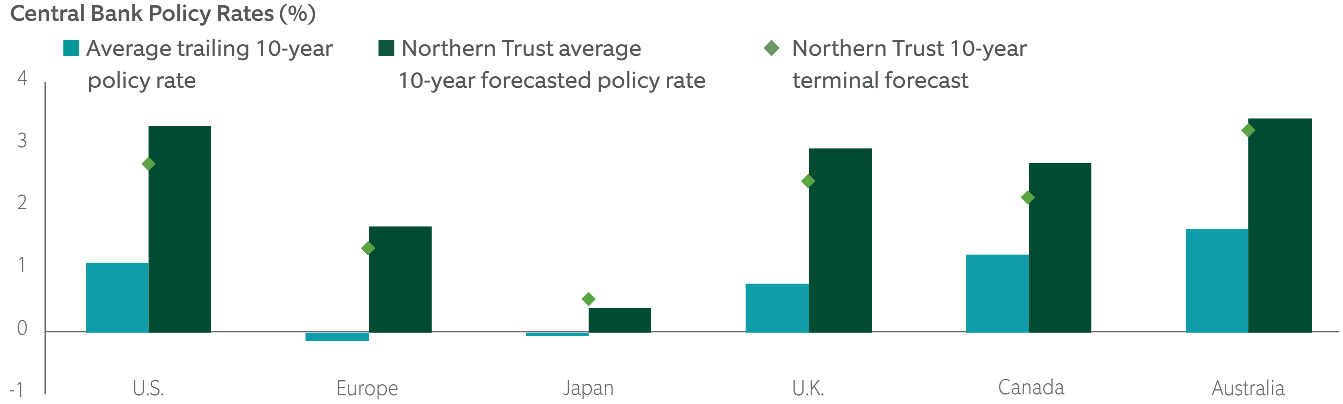
The adjustment to a nominal interest rate environment unlike the one we have experienced throughout the past decade probably will be bumpy. Politicians, investors and consumers may have to adjust their behavior. And that may be difficult, given rising demands for public spending and global attempts to implement an aggressive investment agenda associated with the green transition and regionalization. On the plus side, we believe central bank policy rates are close to peaking and will start to decline in 2024, with our average 10-year forecasted policy rate below today's levels across most of the major central banks (Exhibit 4).

We believe central bank policy rates are close to peaking and will start to decline in 2024, with our average forecasted policy rate across the next 10 years below today's levels across most of the major central banks.

EXHIBIT 4: HIGHER BUT NOT SO HIGH

Restrained growth will limit the degree to which inflation keeps policy rates above past-decade levels.

Central Bank Policy Rates (%)



Source: Northern Trust Asset Management, Bloomberg. Data as of June 30, 2023. Historical trends are not predictive of future results.

GEOPOLITICAL FAULT LINES

De-globalization has slowly occurred since the early 2010s, bolstered by resiliency concerns during the pandemic and even more so following Russia's invasion of Ukraine in 2022. Geopolitical events are often thought of as transitory from a financial market lens, however the U.S.-China strategic rivalry is markedly different given their size and economic integration. The economic and financial market impacts may largely be driven by the degree of evolution in U.S.-China relations: ranging from more marginal "de-risking" to a fuller "decoupling" or even armed conflict (a very severe outcome). Beyond the U.S. and China, we expect other countries will generally have to choose a side, although a few larger players may be able to work with both.

Underpinning the strategic tensions is the idea of security across interrelated facets including military, technology, supply chains and energy supply. Semiconductors are crucial as they largely serve as the "new oil" of the global economy. While growing for a while now, the emphasis on semiconductors has increased given the race to develop artificial intelligence capabilities. The U.S. has started heavily incentivizing domestic semiconductor production and green energy (hundreds of billions in investment) while also restricting China's access to key technology inputs. Meanwhile, Western companies are rerouting supply chains away from China, with more urgency in critical industries (e.g., medical equipment versus clothing). The drive for security takes time and requires heavy capital investment — and the push toward resiliency leads to redundancy as it often replicates existing capacity rather than adding new capabilities to drive future growth. All of this implies upward pressures on inflation and a modest drag on economic growth.

These strategic tensions can quietly linger in the background, leaving investors at risk of complacency. However — like tectonic plate shifts that suddenly cause earthquakes — tensions can escalate and lead to major impacts for economic growth and/or financial markets. While near-impossible to directly predict in advance, elevated geopolitical risk forces investors to consider a wider scope of possible outcomes — likely increasing risk premiums and financial market volatility.

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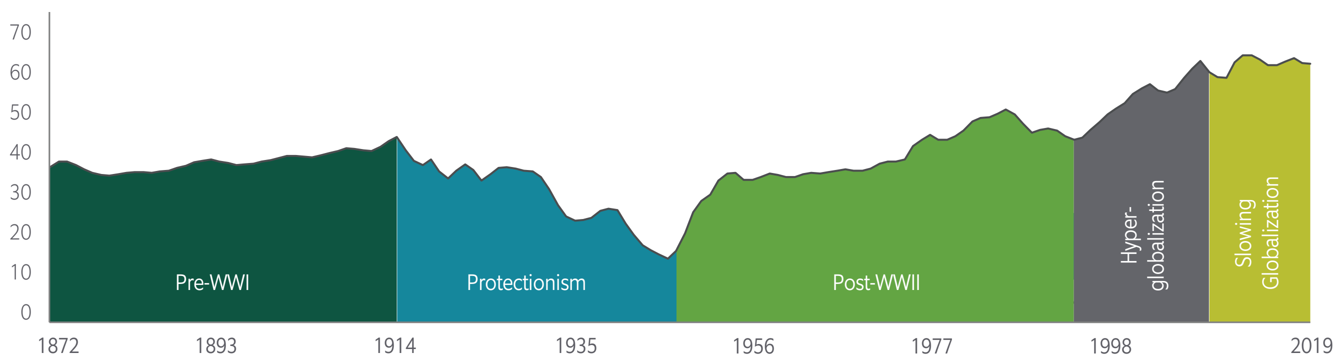
EXHIBIT 5: NO END IN SIGHT FOR DE-GLOBALIZATION

The U.S.-China strategic rivalry is at the center of the slow decline in globalization.

Globalization as Measured by Trade Openness



Source: Northern Trust Asset Management, Barclays Research, World Bank, Òscar Jordà, Moritz Schularick, and Alan M. Taylor. 2017. "Macrofinancial History and the New Business Cycle Facts." in NBER Macroeconomics Annual 2016, volume 31, edited by Martin Eichenbaum and Jonathan A. Parker. Chicago: University of Chicago Press. Trade openness is an average of the sum of imports and exports as a percent of gross domestic product for 17 developed countries. Three-year moving average from 1870 through 2021 (latest available). Historical trends are not predictive of future results.

A SUSTAINABLE GREEN TRANSITION

The green transition is still a go, and the forces behind it are both multiplying and gaining strength. However, varying support globally and important physical and political constraints need to be considered when assessing its future path. In other words, the world must navigate *A Sustainable Green Transition* that balances environmental and economic priorities.

What started out as a desire to decarbonize in response to climate change, and assisted by a steep drop in the price of renewable energy production, has morphed into something much larger. The green transition has become essential for countries dependent on imported fossil fuels to improve their energy security (e.g., Europe & China versus the U.S.). And because they don't want to trade one dependency for another, economic competition to attract and retain green technology and related infrastructure has also become a growing force. This trend is fueled by deepening *Geopolitical Fault Lines* and an aversion to yield attractive sources of economic growth to other countries. Countries are also looking far ahead and realize that carbon-based border adjustment taxes could be coming and a green transition will be needed to maintain long-run competitiveness.

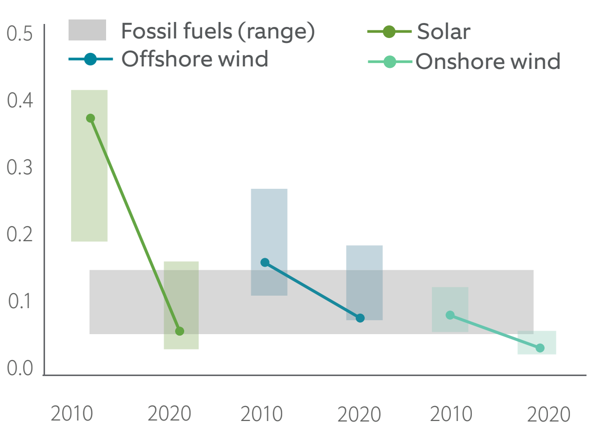
Overcoming physical and political constraints is a key issue for the green transition. The mining industry and its current investment trajectory may not be able to provide the vast amounts of natural resources required to reach climate goals. And political support for the green transition is not evenly spread across the political spectrum. As the costs mount, political constraints may start to bite and slow the transition. That means the transition still faces significant challenges. A strong economy is necessary to sustain the transition, but the fossil fuel that requires in the interim comes at an environmental cost. We think that balancing act will be hard and all but guarantees the transition won't evenly accelerate over the next 10 years — though technology may improve this trajectory. All said, policy persistence is lining up with the economics allowing the transition to continue, even if some of its goals may be hard to reach.

The green transition has become essential for countries dependent on imported fossil fuels to improve their energy security.

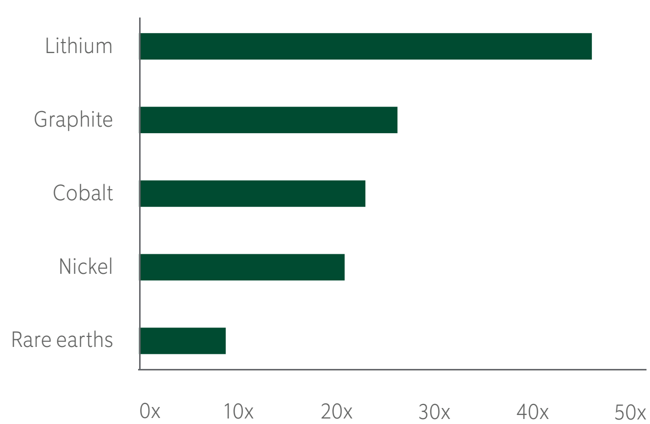
EXHIBIT 6: RESOLVING (UN)SUSTAINABLE CHALLENGES

Lower renewable prices are encouraging, but economic and physical constraints pose a challenge.

Levelized Cost of Electricity ($/KWH)



Materials Needed For Net Zero by 2050: Today vs. 2040



Source: Northern Trust Asset Management, IRENA, Financial Times, IEA. Levelized cost of electricity is the lifetime cost of the energy source divided by its energy production (global weighted average used). KWH = kilowatt-hour. Light-shaded bands for each energy source represent the 5th and 95th percentile of the data, except for the fossil fuels band which represents the full range. Data for materials chart is as of December 31, 2020

PRIVATE MATTERS

Private investments have shown significant growth over the past decade — with private equity representing $7.7 trillion at the end of 2022 (versus under $2 trillion in 2012) and private credit at $1.5 trillion (versus $0.3 trillion a decade ago). Such rapid growth has turned private investments into an increasingly important funding pillar for the global economy. And this, in turn, is increasing private allocations within investment portfolios — going deeper into portfolios that have been using private investments for years, but also spreading to portfolios that have never held private investments at all (such as retirement plans). As the private investment infrastructure buildout — including trading, settlement, liquidity, etc. — continues, private investments' rise in prominence will likely continue as well.

At the macroeconomic level, private investing can play a major role in building a more structurally sound global financial system. On the credit side, private investors often have more tolerance for both illiquidity and credit risk — certainly relative to banks, who recently reminded us of the inherent liquidity challenges presented by asset-liability mismatches and have often reminded us of their inability to properly assess risk on behalf of their depositors (the Global Financial Crisis standing out). A defined benefit plan, for instance, has a much better asset-liability match for cash flows generated by industrial property leases than commingled checking accounts. Meanwhile, in a world of cash-strapped governments, private investment can provide substitute funding for historically public-funded projects — notably within *A Sustainable Green Transition*.

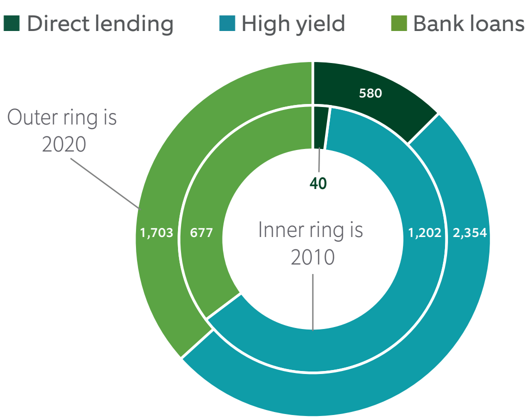
At the investing level, the "infrastructure buildout" noted earlier will increasingly facilitate greater liquidity in this historically illiquid asset class. A rapidly growing secondaries market is providing investors with more exit options, while technology — blockchain, tokenization, etc. — offers the promise of less market friction. Broader participation and more liquidity raise interesting questions as to the appropriate portfolio allocation (we believe larger) and the required asset class return (we expect lower) – *Private Matters* to be discussed by investment committees globally.

The private investment infrastructure buildout will increasingly facilitate greater liquidity in this historically illiquid asset class.

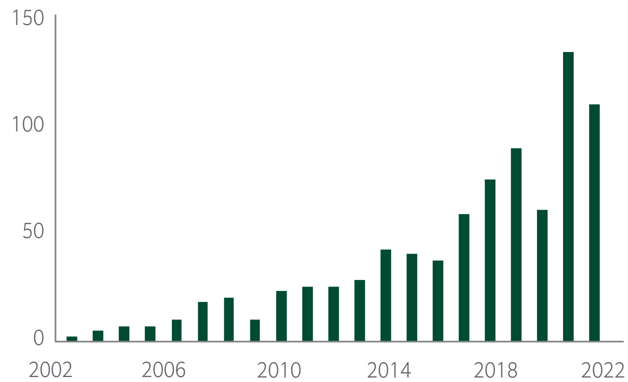
EXHIBIT 7: A THRIVING PRIVATE ECOSYSTEM

Over the past decade, direct lending and private market liquidity have both increased substantially.

Global Leveraged Finance Market Size ($, billions)



Secondary Market Annual Transaction Volume ($, billions)



Source: Northern Trust Asset Management, Apollo Global Management, Preqin, McKinsey Global Private Markets Review 2021, Jefferies 2022 Secondary Market Update. Left chart: from Apollo using Preqin data as of March 2022. Right chart: transaction volume from 2002 through 2022. All data is the most recent available.

FIXED INCOME

Fixed income forecasts are mostly driven by expectations for interest rates and credit spreads. We forecast interest rates across the duration spectrum, separated into "real" and inflationary components (together representing nominal interest rates). We then forecast credit spreads across the credit-rating spectrum, grouped into investment grade and speculative grade (high yield) categories.

We anticipate credit spreads and default rates will be relatively close to long-term averages.

Interest Rate Expectations

Inflation Adaptation and *Central Bank Concessions* are likely to keep short-term rates higher than the 2010s, yet longer term rates will be capped to an extent (relative to history) thanks to *Growth Restraints*. Demographics are likely to weigh on U.S. rates, along with demand for fixed income given its increased appeal versus equities (versus the post-GFC low-rate era). Exhibit 8 shows a simplified (three-month to 10-year) yield curve, comparing our 10-year interest rate forecasts against market expectations and current levels for the U.S., Germany and Japan. We expect upwardly-sloped (and above-zero) yield curves across each region.

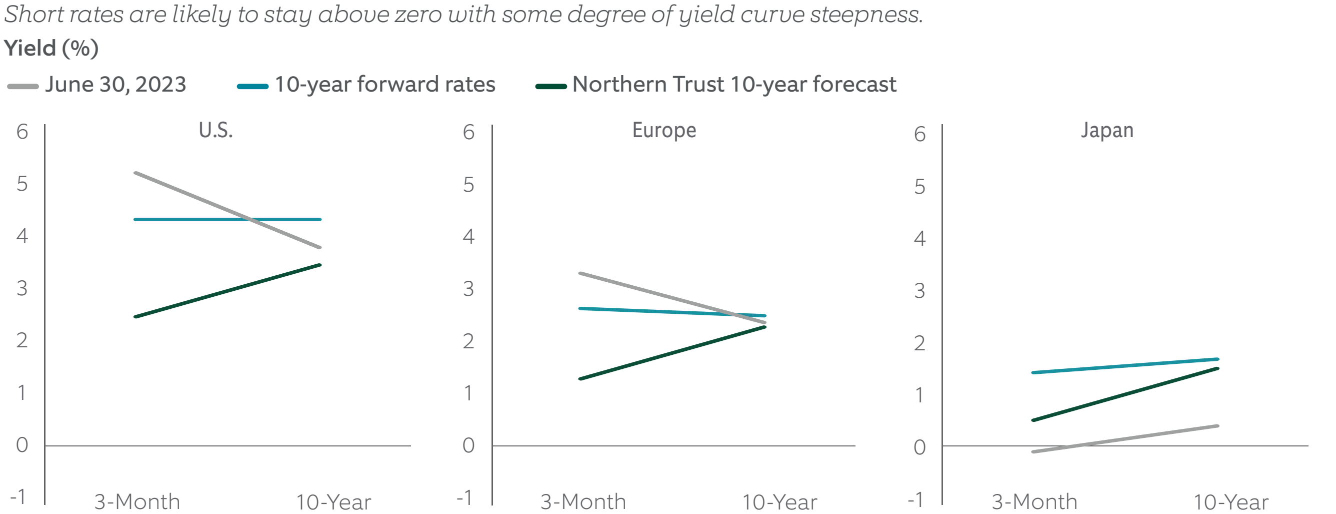
Credit Spread Expectations

We anticipate credit spreads and default rates will be relatively close to long-term averages. Stable credit fundamentals will likely face pressure from higher interest rates and normalization in profit margins (from elevated pandemic-era levels). Credit risk premiums are likely to be modestly higher than the post-GFC era as central banks have exited quantitative easing. Plus, the capital investment needed for regionalization and the green transition may increase issuance. That said, we believe solid nominal economic growth will help issuers make coupon payments.

Depending on the asset class, some of these expectations are more important than others. Cash forecasts are largely based on the expected progression of short-term interest rates over the next 10 years. Other forecasts are more complex, contemplating a variety of factors, all in the context of what is priced in.

EXHIBIT 8: NO MORE NEGATIVE RATES

Short rates are likely to stay above zero with some degree of yield curve steepness.



Source: Northern Trust Asset Management, Bloomberg. Data as of June 30, 2023. German yields, often cited as the euro area benchmark, are used as a proxy for Europe. The 10-year forward rates represent market expectations of rates in 10 years. Please see important forecast disclosures on page 19.

Cash Return Forecasts

Cash return forecasts generally fall in between today's restrictive policy levels and the zero-rate policy seen in the 2010s. We forecast a 2.9% return in the U.S., with similar projections for Australia (3.0%), the U.K. (2.6%) and Canada (2.4%). Europe's (1.5%) forecast is somewhat lower while Japan's remains the lowest (0.3%).

Inflation-Linked Return Forecasts

As our prior *Stuckflation* theme is in the rearview mirror and our inflation views are largely similar to market forecasts, inflation-linked bond returns are expected to be comparable to similar duration Treasuries. Our forecasts imply U.S. real rates will be in zero-to-slightly positive territory. Our U.S. inflation-linked forecast is 4.4%.

Investment Grade Return Forecasts

Over the past 40-plus years, the 10-year annualized U.S. investment grade return has largely matched the starting-point yield (0.1% higher on average). Our interest rate forecasts are largely similar to market expectations — limiting the potential for capital appreciation. However, the forecasts benefit from today's relatively high starting-point yields and we largely expect returns to match yield to maturities. Companies will likely be more judicious with their use of debt when facing 5%-plus coupon payments instead of ~3% in the prior low-rate world.

High Yield Return Forecasts

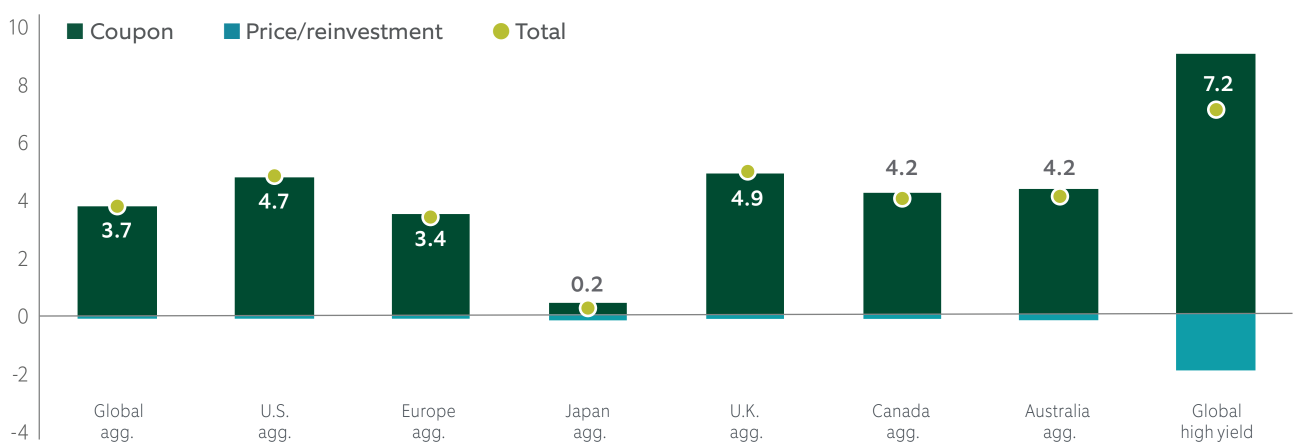
Credit (default) risk is most apparent in high yield, where 10-year returns have trailed starting-point yields by a historical average of 2.3%. We expect headwinds from companies eventually having to refinance at higher rates to be offset by improved index quality, decent nominal economic growth and a better outlook for commodity-related areas of the asset class (a source of prior distress). A 2% cut to the June 30 yield of 9.2% results in a 7.2% global high yield forecast.

Our interest rate forecasts are largely similar to market expectations — limiting the potential for capital appreciation.

EXHIBIT 9: ABUNDANT YIELDS

We largely expect returns across fixed income to match yield to maturities.

Northern Trust 10-Year Annualized Fixed Income Return Forecast (%)



Source: Northern Trust Asset Management, Bloomberg. Coupon return calculated as yield to worst on June 30, 2023. Please see important forecast disclosures on page 19.

EQUITIES

We begin our equity forecasting process with a quantitative analysis to understand which variables have driven equity returns over time. Of the variables analyzed, cash flow yields (cash flow over share price) best predict future returns. Analyzing developed market equity data going back to 1970, cash flow yields have explained 78% of next-10-year (versus 40% of next-five-year) total return variability. This year, our quantitative process predicts a 4.8% annualized return, which is below the historical average return given a relatively high valuation starting point.

Meanwhile, a shorter data set limits the quantitative analysis of emerging market equities. The data we do have (starting in 1987) shows emerging markets have a 0.7 correlation to developed markets, with a 1.3% annualized excess return. More recently, this return premium has been negative and we expect that to continue due to the de-globalization trend described in *Geopolitical Fault Lines*.

Our forward-looking thematic views — applied to the key equity forecast building blocks listed below — help us derive an expected return in a rigorous manner.

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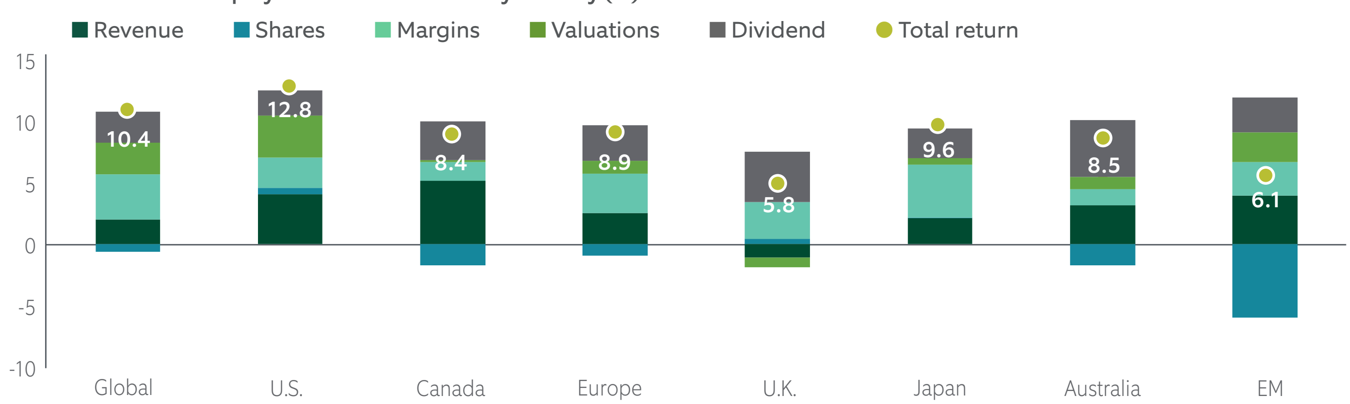
Key Forecast Building Blocks

1. **Revenue growth** is based on our nominal economic growth forecasts weighted by each equity index's geographic exposures.
2. **Share count** reflects the expected change in the outstanding shares in an index due to repurchases or new issuance.
3. **Profit margin** represents companies' ability to turn revenue per-share into earnings through profit margins.
4. **Valuation** impact is based on expected changes in price-to-earnings ratios, which better align with our "building block" forecasting approach than the cash flow yields used in our quantitative process (the two are correlated).
5. **Dividend yield** estimates are based on current levels, adjusted based on any expected changes to the amount of cash companies return to shareholders.

EXHIBIT 10: A TEAM EFFORT

Excluding slight share issuance, all other return components supported above-average equity gains.

10-Year Annualized Equity Return Contribution by Country (%)



Source: Northern Trust Asset Management, Bloomberg. Data from June 30, 2013 to June 30, 2023. EM is emerging markets. Index performance returns do not reflect any management fees, transaction costs or expenses. It is not possible to invest directly in any index. Past performance is not indicative of future results.

Developed Market Return Forecasts

Our 10-year annualized forecast for developed market equities is 6.3% — compared to the 10.1% annual return of the past 10 years. It is clear from the drivers of the expected return that there is a split between the tailwinds from healthy nominal revenue growth and U.S. share buybacks versus modest headwinds from valuation and profit margin contraction. This split is explained by the thematic views outlined earlier in this report, specifically *Growth Restraints* calling for slower real economic growth and *Inflation Adaptation* forecasting higher inflation. That mix supports revenue growth, which is driven by nominal (not real) growth, but weighs on corporate profit margins and valuations. Developed market revenue growth in the next 10 years is expected to be 4.5% (annualized, as are all of the ensuing rates) with repurchases serving as a lesser benefit (0.4%). At the same time, inflation in combination with de-globalization and the green transition may push expenses higher and support interest rates. We expect profit margins to shrink, detracting 0.4% annually from our expected return. Those same forces are also expected to continue to weigh on valuations (but remain above historical average levels) and in doing so lower the total return by 0.3% annually. Finally, adding a 2.1% annual dividend yield gets us to the 6.3% total return forecast.

In terms of return drivers for developed markets, we see a split between the tailwinds from healthy nominal revenue growth and U.S. share buybacks versus modest headwinds from valuation and profit margin contraction.

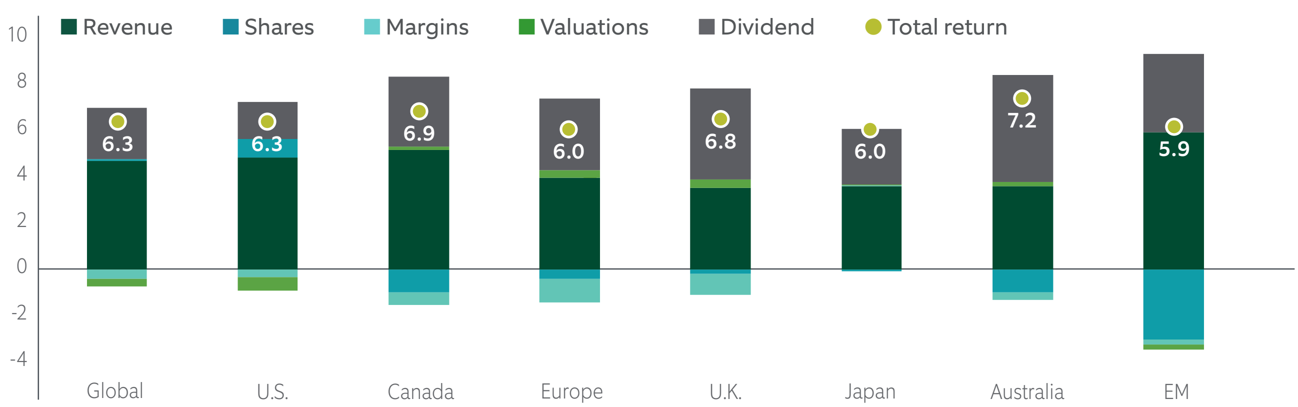
Emerging Market Return Forecasts

Emerging market (EM) equity discussions are dominated by China — not just because of its large ~30-35% representation, but also given how it impacts the broader EM universe. Our *Geopolitical Fault Lines* theme calls for a deepening rift with negative economic, financial and political consequences. This is reflected in lower expected valuations and profit margins, both detracting 0.2% annually from our expected EM equity return. Meanwhile, potential revenue growth per share is held back by share dilution and at 2.9% comes in below the 4.9% for developed markets. With a 3.4% dividend yield, we arrive at a 5.9% forecast.

EXHIBIT 11: EXPECT LOWER NEXT-10-YEAR RETURNS

We expect lower but decent returns supported almost entirely by revenue growth and dividends.

Northern Trust 10-Year Annualized Equity Return Forecast by Country (%)



Source: Northern Trust Asset Management. EM is emerging markets. "Shares" means the effect on equity returns from share issuance or repurchases. Index performance returns do not reflect any management fees, transaction costs or expenses. It is not possible to invest directly in any index. Past performance is not indicative of future results. Forecast as of June 30, 2023. Please see important forecast disclosures on page 19.

REAL ASSETS

The industry term “real assets” is clumsy. The primary real assets (global natural resources, real estate and listed infrastructure) are financial instruments; as such, they aren’t technically real assets. But they do play key roles in the investment portfolio. Natural resources can provide protection against unexpected inflation, while real estate and listed infrastructure offer additional risk exposures for additional portfolio diversification and higher yields than traditional equities.

Our real asset forecast process starts with a review of historical relationships in order to identify key return drivers. Because our real assets are equity-based, they all have statistically significant exposure to the market. But other return drivers are also present, as outlined in Exhibit 12 — including term (interest rate risk) and credit (default risk). The betas in Exhibit 12 indicate the return accrued to the asset class for every 1% move in the factor. For instance, on average and all else equal, global real estate captures 0.9% for every 1% move in the market factor.

Multiplying the factor betas (the risk exposures described above) by our factor return expectations provides a quantitatively driven baseline forecast for consideration in the context of our forward-looking themes. For instance, the 8.3% real estate forecast comprises contributions from market (equity), credit (default) and term (interest rate) risk exposures of 3.2%, 1.1% and 1.1%, respectively — plus our 2.9% cash forecast (originally stripped out of the factor return above).

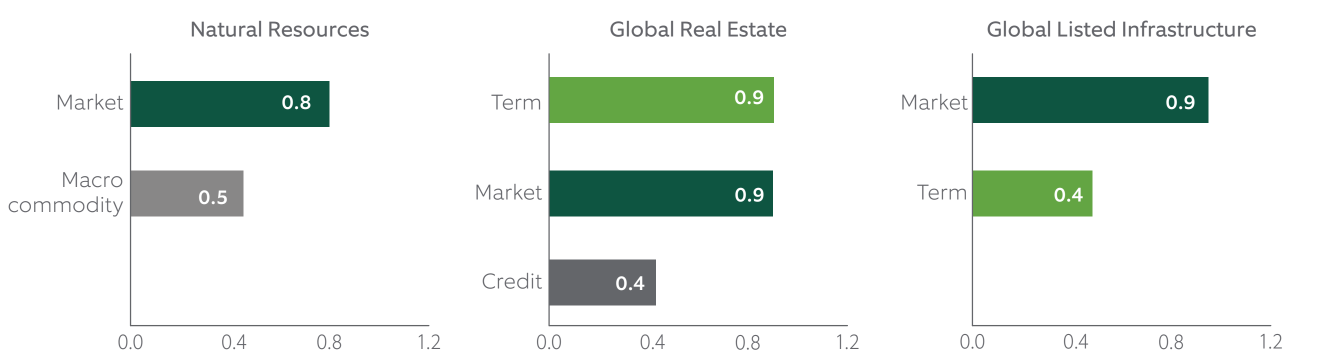
We apply a qualitative return adjustment to our historically based quantitative analysis when we have strong reason to believe that future returns will deviate from historical relationships. However, with an extended long-term forecast horizon of 10 years, we have a greater degree of confidence that historical patterns will hold over the full period given the mean-reverting tendencies of financial markets. As such, we move forward with a higher bar for implementing qualitative return adjustments and made no such modifications this year. On the next page, we discuss the forecasts in the context of our forward-looking views.

Natural resources can provide protection against unexpected inflation, while real estate and listed infrastructure offer additional risk exposures for additional portfolio diversification and higher yields than traditional equities.

EXHIBIT 12: THE RISK EXPOSURES

All real assets have notable market (equity) exposure, but other exposures are also present.

Real Asset Factor Exposure (Beta)



Source: Northern Trust Asset Management, Bloomberg. Regressions calculating factor exposure (beta) run from December 31, 2002 to March 31, 2023. Term exposure is defined as the return premium associated with taking on maturity risk; that is, of investing in longer term bonds. Macro commodity exposure is defined as the return premium associated with commodity spot exposure. Past performance is not indicative of future results. Beta indicates the return accrued to the asset class for every 1% move in the factor. Beta is a measure of systematic risk, or the sensitivity of prices to movements in the benchmark.

Natural Resources

Our 7.9% forecasted return for natural resources (NR) compares favorably to global equities (6.3%). Valuations are attractive at around 9x forward earnings versus a historical median of 13x (and over 16x for equities). *A Sustainable Green Transition* should benefit commodity demand as the clean energy buildout requires a meaningful amount of industrial metals (plus, peak oil demand is not expected until around 2035) — with NR companies offering additional support for the transition via innovation. As investors contend with *Geopolitical Fault Lines*, NR serves as an effective risk management tool against events that could disrupt energy supply (like the Ukraine war) and agriculture production given many of the biggest exporters of food commodities are most vulnerable to flooding and drought.

A Sustainable Green Transition should benefit commodity demand as the clean energy buildout requires a meaningful amount of industrial metals.

Global Real Estate

The office and retail property sectors make up ~30% of commercial real estate debt. With rates likely to keep upward pressure on a sizeable amount of near-term refinancing needs, we expect to see some distress in areas with concentrated exposure (e.g., some regional banks). However, broader industry losses appear manageable with contained macro impacts given (among other reasons): better lending standards; strong bank capital ratios; and *Private Matters* offering additional liquidity. The public real estate market has become more diversified with office under 7% of broad indices. Substantial distress has been priced in with valuations at intriguing levels for longer term investors. We expect an 8.3% annualized return.

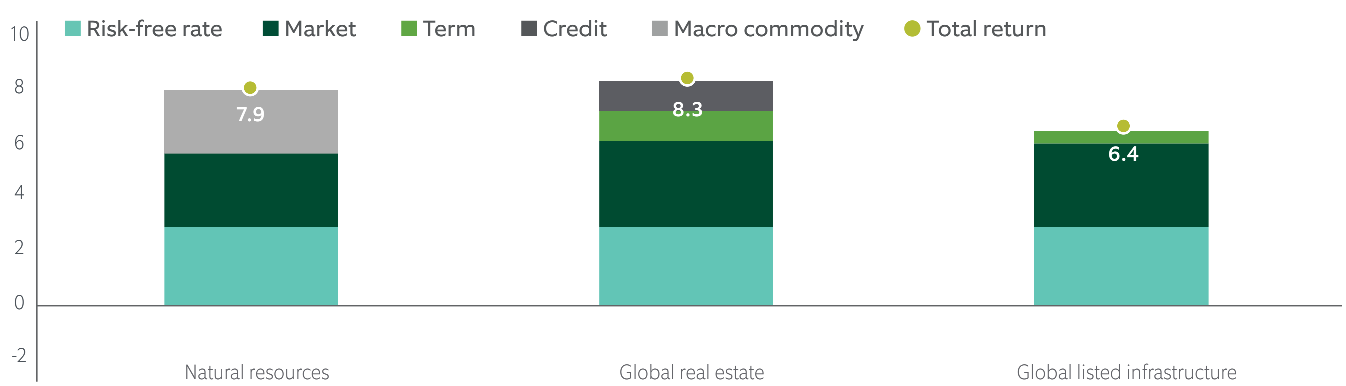
Global Listed Infrastructure

A slightly elevated rate regime may be a modest drag to global listed infrastructure (GLI), but unlike broader economic growth we expect GLI companies to benefit from capital investment in replacing existing supply chain and energy sources. Elevated commodity prices should also provide support. While GLI is less inflation-sensitive than NR, it can be an effective hedge given its companies often engage in longer-duration contracts tied to inflation. We forecast a 6.4% annualized return.

EXHIBIT 13: SUPPORT TOOLS

Real assets should provide welcomed support amid elevated inflation and geopolitical risks.

Northern Trust 10-Year Annualized Real Assets Return Forecast (%)



Source: Northern Trust Asset Management, Bloomberg. Forecasts are as of June 30, 2023. Please see important forecast disclosures on page 19.

ALTERNATIVES

The value of private investments and hedge funds lies in their ability to provide nontraditional exposures and greater "alpha" (risk-adjusted outperformance). There is an inherent difficulty (and conflict of interest) in forecasting alphas (effectively, we are forecasting our own alpha-finding abilities). Therefore, we assume our alternative investments will maintain the broad industry's historically realized alpha, as determined through risk factor modeling — and only include that alpha if it shows statistical significance at the 95% confidence level.

Private Investments

The private investment universe spans the capital structure (from credit to equity) and across all risk assets. We develop our private investment forecasts in the form of return premiums to associated public market return forecasts (e.g., private credit versus high yield). This premium is derived from the asset class alphas — the asset class returns not explained by risk exposures. This is very similar to the real assets process, but with an added element of "lagged" betas to capture delayed appraisals. For instance, private equity quarterly returns are not only correlated to current public equity quarterly returns (i.e., shows "market" beta) but also to the past four quarters of public equity returns. Private credit has a similar relationship to public credit (high yield), but with just one lagged quarter.

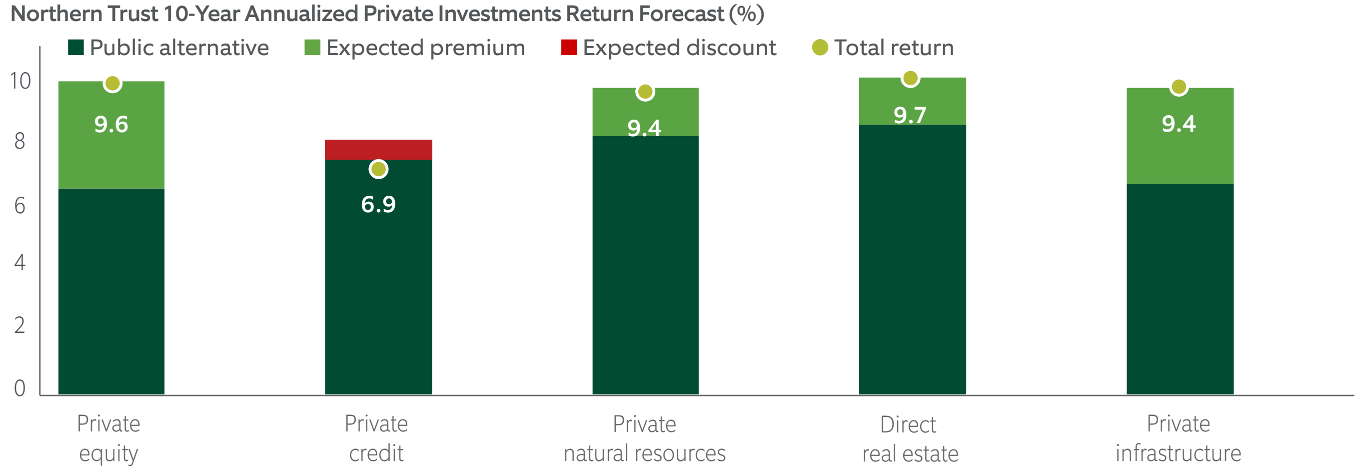
Private equity, broadly speaking, continues to offer material return premiums. Our 9.6% return forecast is driven by a 3.3% return premium, representing a roughly 2% "haircut" from the historically realized 5.4% return premium. This takes a conservative approach to an asset class that can be susceptible to higher rates, and has historically benefited from an illiquidity premium — the size of which may evolve alongside the ever-more-robust private market ecosystem. Private credit also gets a 2% haircut for similar reasons. Private real asset returns take a similar approach. For example, we assign a 1.5% premium to our public equity-based natural resources forecast to arrive at a 9.4% total return expectation.

Private equity, broadly speaking, continues to offer material return premiums. Our 9.6% return forecast is driven by a 3.3% return premium, representing a roughly 2% "haircut" from the historically realized 5.4% return premium.

EXHIBIT 14: FOUR PREMIUMS AND A DISCOUNT

We maintain a minor discount for credit given a relatively tough public-market comparison.

Northern Trust 10-Year Annualized Private Investments Return Forecast (%)



Source: Northern Trust Asset Management, Bloomberg. Forecasts are as of June 30, 2023. Please see important forecast disclosures on page 19.

Hedge Funds

While private investments are compared against public counterparts, hedge funds are compared against the entire portfolio. We isolate average hedge fund alpha by stripping out risk exposures (betas) that can be cheaply captured in the traditional portfolio. These betas include market (and a one-month lagged market factor), credit (default risk) and term (interest rate risk). While hedge fund strategies can benefit the portfolio through "true" alpha (adjusting returns for risk exposures), they can also deliver "esoteric beta" (risk exposures not cheaply available to the average investor). Since we are only adjusting for market, credit and term, any hedge fund "alpha" will also be capturing the esoteric beta.

For a sense of alpha-generating trends, we calculated broad hedge fund alpha by decade (Exhibit 15). Alpha generation had been in persistent decline, falling from an annualized 7.1% in the 1990s to 3.0% in the 2000s — and then barely positive (0.4%) in the 2010s. But, thus far this decade (now over 30% done), alpha has shown a move higher. Theoretically, it would be expected that increased alpha would come from investing in an environment presumably more driven by fundamentals (as opposed to 0% interest rates). This decade's alpha (thus far) has provided some possible credence for that view. We will continue to monitor hedge fund alpha generation — both at the index and individual strategy levels.

Hedge fund alpha generation had been in persistent decline, falling from an annualized 7.1% in the 1990s to 3.0% in the 2000s — and then barely positive (0.4%) in the 2010s. But, thus far this decade (now over 30% done), alpha has moved higher.

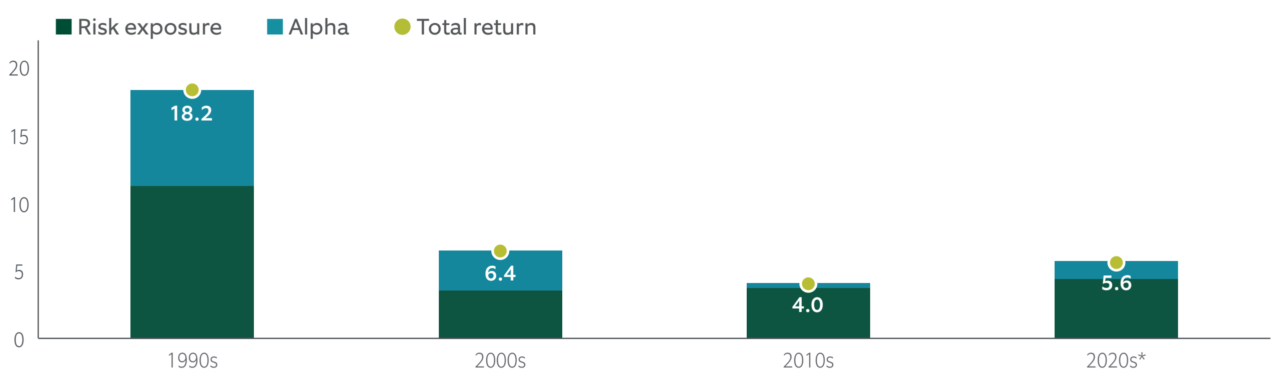
A Note on Alternative Forecasts

Alternative asset class indexes — generally an average of a universe of managers/strategies — are not "accessible" the way the public indexes are. Further, the alpha generation of the strategies in these indexes (often the biggest contributor to strategy return) can vary widely. We provide alternatives forecasts with the full admission that the manager/strategy selection process will largely dictate alternative asset returns. In that sense, our alternative forecasts can be thought of as the "required return" (the benchmark) — or, perhaps more accurately, the "required implied alpha" for any strategy to deserve a spot in the investment portfolio.

EXHIBIT 15: ALPHA THROUGH THE DECADES

About one-third of the way through this decade, alpha has shown a move higher thus far.

Hedge Fund Return Contribution by Decade (%)



Source: Northern Trust Asset Management, Bloomberg. Data from December 31, 1990 to March 31, 2023. *2020s through March 31, 2023. Past performance is no guarantee of future results.

EXHIBIT 16: NORTHERN TRUST DETAILED LONG-TERM RETURN FORECASTS

All Returns in % Annualized				Long-Term Return Forecasts by CMA Year						10-Year Actual Return
		Asset Class	Proxy Index	2024^	2023	2022	2021*	2019	2018	
Fixed Income	U.S.	Cash	3-Month U.S. T-Bill	2.9	2.8	0.3	0.1	1.1	2.2	1.1
		Inflation linked	Bloomberg U.S. TIPS	4.4	3.4	2.2	2.4	2.6	2.9	2.1
		Investment grade	Bloomberg U.S. Aggregate	4.7	3.7	2.4	2.3	3.0	3.6	1.5
		High yield	Bloomberg U.S. High Yield	6.7	7.4	3.5	5.5	5.0	4.9	4.4
		Municipal	Bloomberg Municipal	3.6	3.2	2.0	2.6	2.4	3.2	2.7
	Canada	Cash	3-Month Canada T-Bill	2.4	3.3	0.2	0.2	0.7	1.6	1.2
		Inflation linked	FTSE Canada Real Return Bond	3.5	3.5	2.0	2.2	2.0	2.3	2.3
		Investment grade	FTSE Canada Universe	4.2	3.9	2.4	1.9	2.6	2.9	2.1
		High yield	BofAML Canadian High Yield	6.0	6.0	3.8	5.2	4.5	4.5	4.9
	Europe	Cash	3-Month German Bunds	1.5	0.3	-0.4	-0.5	-0.3	-0.3	-0.2
		Inflation linked	Bloomberg Euro Inf. Linked	2.0	2.2	1.0	1.5	1.0	1.2	2.8
		Investment grade	Bloomberg Euro Aggregate	3.4	2.1	1.0	1.0	1.2	1.8	0.8
	U.K.	Cash	3-Month Gilts	2.6	2.1	0.2	0.1	0.3	0.9	0.8
		Inflation linked	Bloomberg Inflation Linked Gilt	4.0	3.3	1.0	1.3	2.2	1.7	1.6
		Investment grade	Bloomberg Sterling Aggregate	4.9	2.9	1.5	1.3	2.2	2.5	0.7
	Japan	Cash	3-Month JGB	0.3	0.1	-0.1	-0.1	-0.1	0.0	-0.1
		Inflation linked	Bloomberg Inflation Linked JGB	0.0	0.1	0.2	0.5	0.2	0.5	1.0
		Investment grade	Bloomberg Japanese Aggregate	0.2	0.3	0.2	0.2	0.2	0.5	0.9
	Aus.	Cash	3-Month Australia Gov't Bond	3.0	3.2	0.3	0.2	0.8	2.5	1.7
		Investment grade	Bloomberg Australian Composite	4.2	3.7	1.5	1.2	2.2	3.5	2.3
	Global	Inflation linked	Bloomberg Global Inflation Linked	3.6	2.9	1.5	1.8	2.0	2.0	2.7
		Aggregate	Bloomberg Global Aggregate	3.7	2.7	1.5	1.6	2.1	2.7	2.1
		High yield	Bloomberg Global High Yield	7.2	7.5	4.0	5.6	4.8	4.6	3.5
Equities	Developed markets	U.S.	MSCI United States	6.3	6.0	4.3	4.7	5.7	5.8	12.8
		Canada	MSCI Canada	6.9	6.6	5.2	4.5	4.5	5.5	8.4
		Europe	MSCI Europe ex U.K.	6.0	6.1	4.7	5.4	6.0	6.3	8.9
		U.K.	MSCI United Kingdom	6.8	7.5	6.2	5.6	7.4	6.3	5.8
		Japan	MSCI Japan	6.0	6.3	4.1	3.8	4.5	6.0	9.6
		Australia	MSCI Australia	7.2	6.4	4.7	5.8	5.7	7.7	8.5
	Agg.	Developed markets	MSCI World	6.3	6.2	4.5	4.8	5.7	6.0	11.0
		Emerging markets	MSCI Emerging Markets	5.9	5.8	5.3	5.4	6.1	8.3	6.1
		Global equities	MSCI All Country World	6.3	6.1	4.6	4.9	5.8	6.2	10.4
Real	Global	Natural resources	S&P Global Natural Resources	7.9	7.3	5.0	3.6	6.1	7.2	5.8
		Listed real estate	MSCI ACWI IMI Core Real Estate	8.3	6.8	5.1	6.3	6.3	6.0	3.7
		Listed infrastructure	S&P Global Infrastructure	6.4	6.0	5.5	5.8	5.8	5.4	6.7
Alts		Private equity	Cambridge Global Private Equity	9.6	9.6	7.6	7.9	7.7	8.0	N/A
		Private credit	Cambridge Global Private Credit	6.9	6.5	6.0	7.6	6.8	6.6	N/A
		Hedge funds	HFRI Fund Weighted Comp	4.5	5.4	2.9	2.6	3.7	4.3	4.5

Source: Northern Trust Asset Management. ^Starting with the 2024 edition, we changed the long-term investment horizon to 10 years from five years. *The naming convention was changed to the forward year starting with the 2021 edition, which was published in 2020. For each CMA edition, the long term forecast period is as follows: 2024 (6/30/2023 to 6/30/2033), 2023 (6/30/2022 to 6/30/2027), 2022 (6/30/2021 to 6/30/2026), 2021 (6/30/2020 to 6/30/2025), 2019 (6/30/2019 to 6/30/2024), 2018 (6/30/2018 to 6/30/2023). Forecasts listed here represent total return forecasts for primary asset classes, annualized using geometric averages. Forecasted returns are based on estimates and reflect subjective judgments and assumptions. They are not necessarily indicative of future performance, which could differ substantially. 10-year actual returns are listed in local currency (with the exception of real assets, which are in USD) and annualized for the 10-year period ending 6/30/2023. Past performance does not guarantee future results. Index performance returns do not reflect any management fees, transaction costs or expenses. It is not possible to invest directly in any index. Indexes are the property of their respective owners, all rights reserved.

ABOUT THE CMA PROCESS

Every year, Northern Trust's Capital Market Assumptions (CMA) Working Group gathers to develop long-term financial market forecasts. The team adheres to a forward-looking, historically aware approach. This involves understanding historical relationships between asset classes and the drivers of those asset class returns, but also debating how these relationships will evolve in the future.

Our forward-looking views are encapsulated in our annual list of CMA themes, which — combined with our quantitative analysis — guide our expectations for long-term asset class returns. The CMA return forecasts are combined with other portfolio construction tools (standard deviation, correlation, etc.) to annually review and/or update the recommended strategic asset allocations for all Northern Trust managed portfolios and multi-asset class products.

The CMA Working Group is composed of senior professionals from across Northern Trust globally, including top-down investment strategists, bottom-up research analysts and client-facing investment professionals. CMA Working Group members are listed here.

ABOUT NORTHERN TRUST

Northern Trust is a preeminent global financial institution that provides asset servicing, investment management and wealth management services for institutions, high-net-worth individuals and families. For more than 130 years, our success has been anchored in one purpose: to serve as our clients' most trusted financial partner, guarding and growing their assets as though they are our own. Today, we are more than 23,000 employees strong around the globe and manage $1.4 trillion in assets (as of June 30, 2023) for our clients.

We earn their trust by staying true to our steadfast fiduciary heritage and providing differentiated, exceptional service tailored to each client's specific needs. Our market-leading technological capabilities allow us to deliver the highest level of service to our clients with speed and precision.

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CMA model expected returns are based on IPC forecasted returns and reflect Northern Trust's Investment Policy Committee's forward-looking annual capital market assumptions. The Capital Market Assumptions Working Group, a subset of IPC members, publishes its assumptions as a white paper report. Forecasted returns are annual returns (geometric basis). The model cannot account for the impact that economic, market and other factors may have on the implementation and ongoing management of an actual investment strategy. Model outcomes do not reflect actual trading, liquidity constraints, fees, expenses, taxes and other factors that could impact future returns. The model assumptions are passive only. References to expected returns are not promises or even estimates of actual returns an investor may achieve. The assumption, views, techniques and estimates set out are provided for illustrative purposes only. Forecasts of financial market trends that are based on current market conditions constitute the CMA Working Group judgment and are subject to change without notice. "Expected" or "alpha" return estimates are subject to uncertainty and error. The ability to achieve similar outcomes is subject to risk factors over which Northern Trust may have no or limited control.

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