NORTHERN TRUST

CAPITAL MARKET ASSUMPTIONS

FIVE-YEAR OUTLOOK: 2023 EDITION

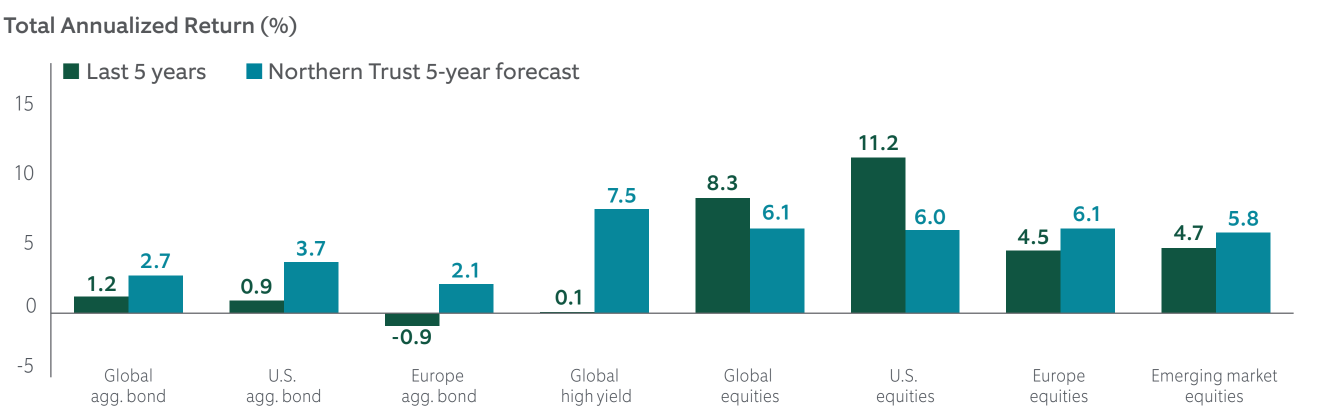
Published August 10, 2022

We expect financial market returns over the next five years to be modestly below long-term historical averages. Fixed income returns will likely be helped by higher yield starting points but capped by flatter global yield curves. We believe equity returns will be helped by today's lower valuations but hurt by slow growth and the impact of higher interest rates on profit margins and valuation upside.

Our return forecasts are created using our "forward-looking, historically aware" process, wherein historical returns and relationships are subjected to our forward-looking themes. We expect **Slow Growth Transitions** as we go through an **Inflation Recalibration** and expect a **Monetary Drought** — certainly when compared to the recent central bank flood. Globalization will likely evolve into **Regional Rebuilding Blocs** focused on energy security, but the **Green Transition is Still a Go**. Lastly, with interest rates **Not So Negative**, we finally exit a very odd period in economic and market history.

EXHIBIT 1: COME TOGETHER

We expect future returns to converge — both across regions and against historical averages.



Source: Northern Trust Asset Management, Bloomberg. Annualized return data in local currency from 6/30/2017 to 6/30/2022. 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.

2023 THEMES & ASSET CLASS RETURNS OVERVIEW

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

Slow Growth Transitions

Slow transitions — pandemic to endemic; globalization to regionalization; and fossil fuels to renewables — represent economic challenges for a global economy already facing debt and demographic headwinds. Slow transitions will likely lead to continued slow growth.

Regional Rebuilding Blocs

Globalization is evolving into regional systems driven by security needs — both economic and military. While this economic deglobalization may move slowly, we think decisions on whether — or how best — to deglobalize portfolios will come more quickly.

Inflation Recalibration

Automation and digitization are still impactful disinflationary forces, but can take time to overcome the recent shocks of stressed global supply chains, tight commodity markets and depressed labor supply. Recalibration will likely take much of the five-year horizon.

Green Transition Still a Go

The rising costs and insecurity of energy supplies have led policymakers to prioritize meeting energy demand in the near term even if it means increasing carbon emissions. But, over the medium term, climate initiatives remain an important consideration.

Monetary Drought

The post-Global Financial Crisis monetary flood has evaporated — and the next five years may bring much drier conditions. The past couple years of quasi-modern monetary theory policy — partially responsible for high inflation — will unlikely repeat soon.

Not So Negative

Higher interest rates — including a move out of negative territory for Europe and Japan — bring investors closer to positive real (after inflation) cash returns. Good for economic functioning (and savers), but a headwind for risk asset valuations.

Fixed Income

Fixed income forecasts are getting a boost from a higher yield starting point, but remain subdued by historical standards. Flat yield curves mean more dependence on coupon payments (versus price appreciation). We expect high yield returns to benefit from wider credit spreads amid stable fundamentals.

Real Assets

Less valued during the years of *Stuckflation*, real assets have become an important component of the portfolio. All real assets should do well in the five-year environment we predict, but natural resources are particularly attractive given both near- and long-term commodity needs.

Equities

Equity forecasts are helped by a lower valuation starting point, but face headwinds from a lower valuation ceiling and some margin compression — mostly driven by the end of the zero/negative monetary policy era. Absolute returns are decent, but return premiums are lower this year.

Alternatives

Private investments are providing attractive premiums over public market counterparts. Hedge funds recently have shown more potential to provide alpha. The wide return dispersion among strategies means the manager selection process remains paramount.

SLOW GROWTH TRANSITIONS

Debt and demographic headwinds continue to limit economic growth. Retirement parties are now more common as baby boomers exit the workforce, and debt is structurally high (pandemic stimulus increased global debt by 30 percentage points in 2020).[1] But we've written about this for years. Newly affecting the global economy are the slow transitions taking place, including pandemic to endemic; globalization to regionalization; and fossil fuels to renewables. Two of these are sufficiently important to warrant a theme. The transition from globalization to regionalization — gaining momentum as a result of the pandemic and geopolitical strains — sacrifices efficiency for security (see *Regional Rebuilding Blocs*, page 6). Meanwhile, the transition from fossil fuels to renewables (see *Green Transition Still a Go,* page 7) may lower economic growth potential. The transition has slowed at the moment but is likely to regain traction.

Newly affecting the global economy are the slow transitions taking place, including pandemic to endemic; globalization to regionalization; and fossil fuels to renewables.

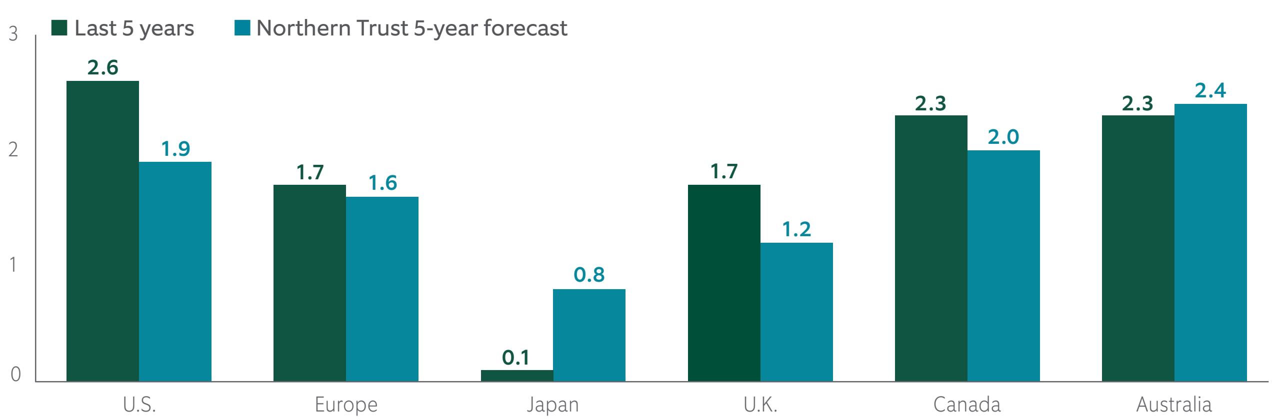
The West has largely moved into the endemic stage of COVID-19, but periodic case spikes can still derail consumer sentiment and keep workers out of the labor market. China's path to endemic status has been more obstacle-ridden. Low vaccine efficacy has left many vulnerable to COVID, while China's zero-COVID strategy has left its economy vulnerable to a slowdown. Nature is a powerful force (and is proving more powerful than lockdown strategies), meaning China's transition to endemic will likely be slow and sporadic. This further impairs China's economic growth profile — a growth profile already in structural decline due to a maturing economy and aging demographics (including a shrinking workforce).

We expect 2.6% annualized real global economic growth over the next five years. Our 1.9% U.S. forecast marks a slowdown from the past five years but still is ahead of most other advanced economies (largely due to better demographics). Our 3.7% China forecast is also a slowdown from the past five years (due to growing structural challenges). In general, the more exposed a country is to slow transitions and debt and demographic headwinds, the greater the economic pressure. This puts younger, resource-rich economies (e.g., Canada, Australia) in better shape than older, energy-dependent economies (e.g., Europe, Japan).

EXHIBIT 2: GOOD WHILE IT LASTED

We think the past two years' stimulus-boosted growth will revert to previous slow form.

Annualized Real GDP Growth (%)



Source: Northern Trust Asset Management, Bloomberg. Data from 3/31/2017 to 3/31/2022.

INFLATION RECALIBRATION

No economic variable evolved more rapidly than inflation over the past year. Global supply chain complexities and worker shortages coming out of the pandemic left a bigger mark than expected. Yet many investors and policymakers still believed that the global economy's "transitory inflation" simply caught a case of "long transitory" — and was still moving back toward equilibrium on its own but at a slightly slower pace than previously expected. This all changed with the war in Ukraine. The inflation genie escaped the bottle, and it will take effort to put the genie back.

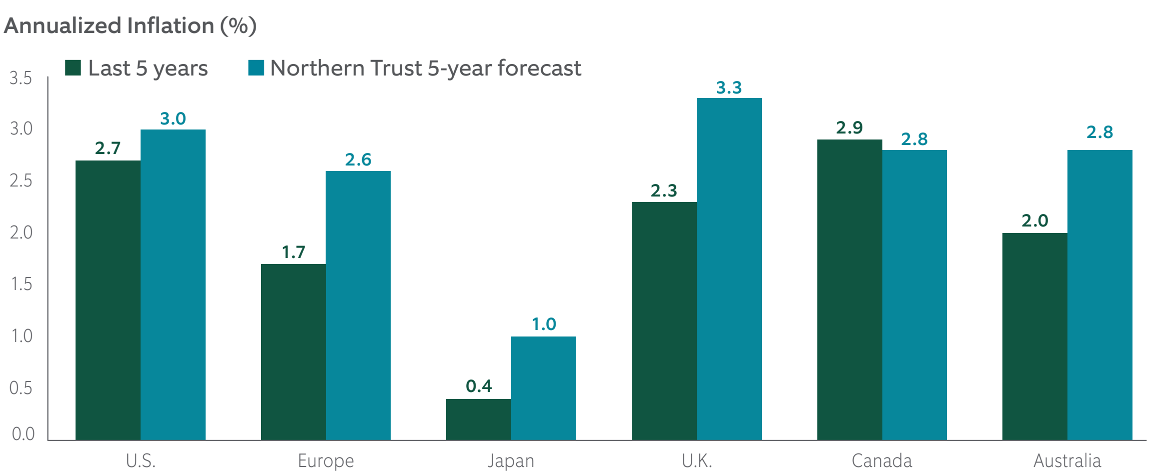
While we expect inflation to take time to move back toward central banks' targets, we do believe the worst has passed.

The war's biggest inflationary impact has been through commodities — and it may last for years. Before the war, Russia supplied 12% of global oil and 17% of global natural gas exports; Russia and Ukraine together supplied 29% of global wheat and 19% of global corn exports.[2] This supply is at risk of disruption — both in the short term (planting/harvesting/exporting) and in the longer term (persistent Russian boycotts). The latter is more important for our five-year horizon, as it further entangles already-snarled global supply chains. It has also notably widened the already-growing "West-East" divide, jump-starting a fairly dramatic rebuilding of infrastructure and trade partnerships (see *Regional Rebuilding Blocs*, page 6).

The inflationary challenges captured by *Regional Rebuilding Blocs* were mostly absent during the *Stuckflation* era. But the other key drivers of *Stuckflation* — automation and digitization — are still around. In fact, they have been further incentivized by recent staffing shortages (remedied by kiosks, apps and, eventually, driverless vehicles) and rising travel costs (prompting more work from home and virtual meetings). Therefore, while getting inflation back in the bottle will probably take time, it will be a much more pleasant experience than the last time inflation hit current levels (1979) and then-Fed Chair Paul Volcker was forced to raise short-term interest rates to 20%. So while we expect a *Monetary Drought* (see next page) — certainly in contrast to the monetary flood of the past decade — we don't expect a monetary dust bowl. And while we expect inflation to take time to move back toward target (see Exhibit 3), we do believe the worst has passed.

EXHIBIT 3: THE END OF AN ERA

The Stuckflation regime is over, replaced by a period of recalibration back toward target levels.



Source: Northern Trust Asset Management, Bloomberg. Data from 3/31/2017 to 3/31/2022. All regions use headline Consumer Price Index as the inflation metric.

MONETARY DROUGHT

As inflation and growth threats have shifted decisively away from deflation to stagflation, the focus of central banks has shifted decisively from accommodating loose fiscal policy back to maintaining price stability. The proverbial monetary flood has largely evaporated, and a drought is upon us. Consequences arising from this shift are significant. Politicians can no longer rely on central bank support for their spending plans or even ensuring low debt servicing costs through suppressed interest rates. The global economy — and all its actors (from the business community to the consumer) — must adjust to higher nominal yields (and higher real yields) when making investment and consumption decisions. At the same time, financial markets must contemplate a world of tighter financial conditions and the absence of the "central bank put" wherein monetary policy would come to the rescue every time the markets stumbled.

Financial markets must contemplate a world of tighter financial conditions.

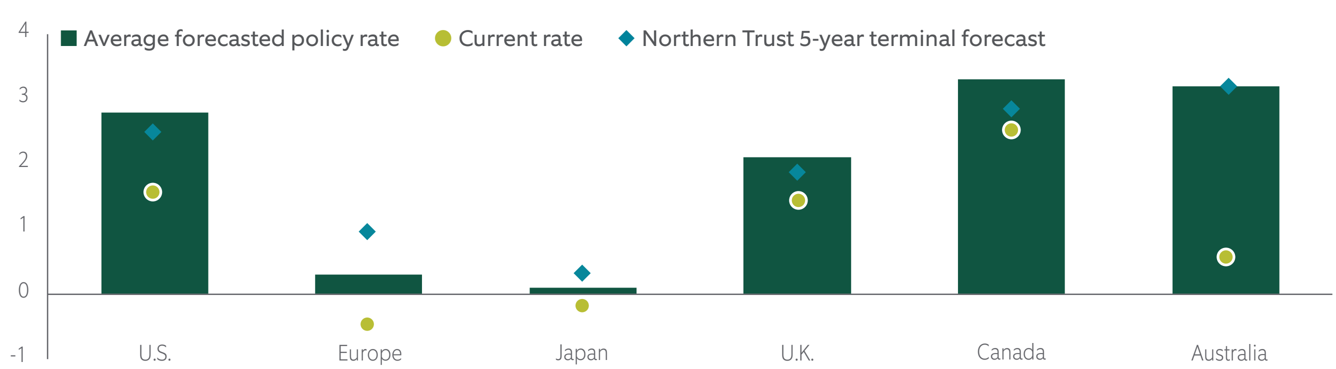
Currently, high-single-digit inflation rates and expectations for a multi-year period return to the 2% target simply don't provide central banks as much room to maneuver on recent ambitions (climate, inequality). Instead, central banks must be singularly focused on ensuring inflation comes back down to target and that inflation expectations remain firmly anchored. Everything else in the current environment is secondary at best — and in direct conflict at worst. On the bright side, the credibility of central banks is still holding firm and expectations are for them to succeed in bringing inflation to heel over the next couple of years — as seen in breakeven rates (the fixed income markets' assessment of future inflation). But those looking for central banks to "make it rain" shouldn't hold their breath.

The "terminal" forecasts found in Exhibit 4 represent where we believe policy rates will be at the end of the five-year period, which can somewhat obscure our year-by-year policy expectations from start to end. For instance, we expect the Fed will end the five-year period at 2.5% but will push rates up over the next year before slowly coming down. The average policy rate (green bars) takes into account our forecasted trajectory (2.8% in the case of the Fed), providing a better indication of the average monetary policy environment expected over the five-year horizon.

EXHIBIT 4: NOT BEING VERY SUPPORTIVE

Central bank policy trajectory and the resulting short-term interest rates are taking a more restrictive turn.

Central Bank Policy Rates (%)



Source: Northern Trust Asset Management, Bloomberg. Data as of 6/30/2022.

REGIONAL REBUILDING BLOCS

Russia's invasion of Ukraine is the latest development in the globalization saga — an event with major geopolitical implications that has highlighted the importance of economic and military security. A spotlight has been cast on the need to limit dependencies on strategic adversaries and on imports in general — the latter already in focus due to the pandemic. Europe stands out given its high level of imports (roughly twice the percentage of economic output versus the U.S. and China — and with a sizable portion of these imports coming from China and Russia). Europe's policy realignment has been most pronounced, but ongoing broader "West-East" tensions will remain a key focal point, while we expect large emerging market countries (think India) to aim to work with both sides.

Viewing security both economically and militarily, two key elements are energy supply and technology. Emphasis on energy security will affect demand for all energy types — both fossil fuels and clean energy (see *Green Transition Still a Go*, page 7). Meanwhile, the technology component accelerates an earlier trend of countries recognizing the importance of technological advantage and self-sufficiency. The "rebuilding" process addressing these needs covers many areas, including military capabilities, semiconductors, fossil fuels, clean energy and related rare earths, as well as supply chain reorientations. However, going this route comes with associated costs. Companies may lose focus on resiliency should supply chains heal and memories of pandemic supply chain disruptions fade — though the severity of new security concerns may help them remember.

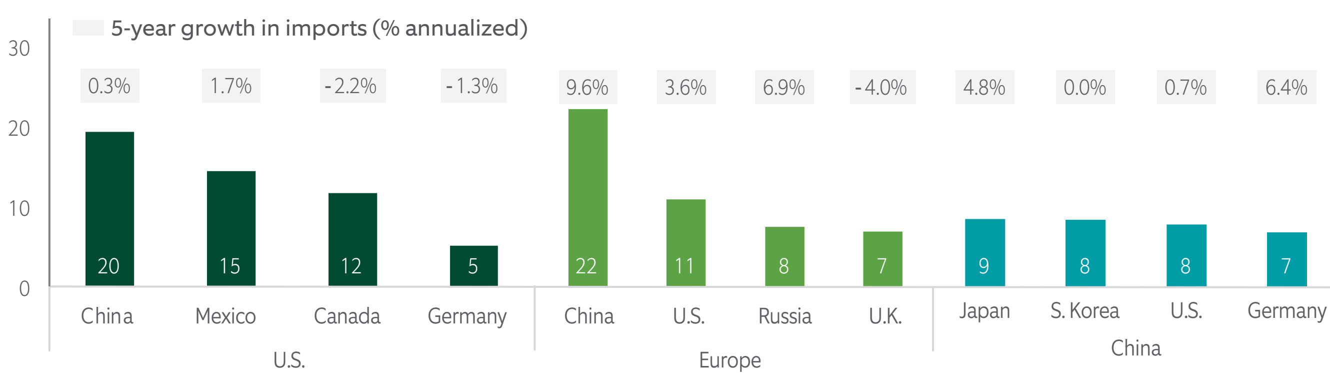
This rebuilding will take time. But, while tasks such as building energy infrastructure or rerouting supply chains are multi-year initiatives, investment portfolios may change more quickly. A case in point is that while companies exiting Russia operations are still ongoing, Russia was excluded from major equity indexes within weeks of invading. Overall, this rebuilding trend may flow through to financial markets in a number of ways, but the most likely avenue is upward pressure on inflation (and resulting headwinds to corporate profit margins). Ultimately, the rebuilding will require major capital investment to largely uphold the prior economic status quo.

The rebuilding process covers a number of areas, including military capabilities, semiconductors, fossil fuels, clean energy and related rare earths, as well as supply chain reorientations.

EXHIBIT 5: RECONSIDERING TRADE RELATIONS

Geopolitical considerations have moved to the forefront as countries rethink trade dependencies.

Import Breakdown by Country (% of total imports)



Source: Northern Trust Asset Management, OEC, Eurostat. Import data as of most recently available calendar year (2020 for U.S. and China, 2021 for Europe).

GREEN TRANSITION STILL A GO

Russia's attack on Ukraine is reverberating around the world in many different ways. A new geopolitical landscape has presented itself alongside new security concerns. And the green transition is right in the middle of it all, albeit with diverging short- and medium-term effects and regional approaches. In the short term, Russia's energy supply weaponization means politicians must ensure energy demand can be met — whatever the source. We think this will delay the green transition. Meanwhile, the invasion has pushed fossil fuel prices higher and spurred a renewed focus on energy security. Those forces may propel private and public investment in renewables and energy conservation beyond decarbonization merits alone. This will likely accelerate the green transition in the medium- to long-term.

With supply and demand likely to keep fossil fuel prices high, the resulting cost-parity equation will likely facilitate a continued natural shift toward renewables.

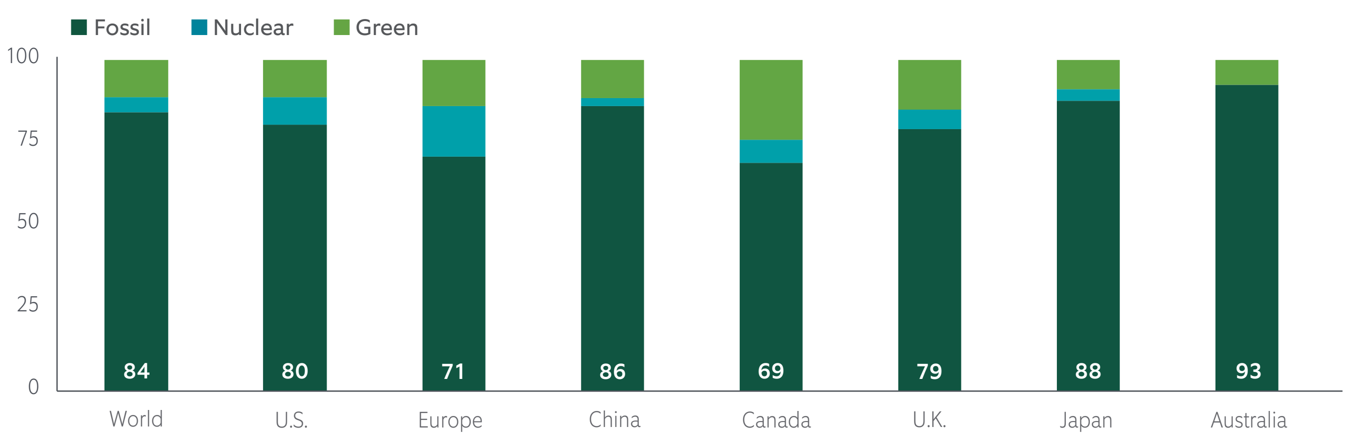
Digging deeper, we expect the approach to the green transition to diverge by region. In Europe and Asia — where a significant part of the fossil fuel supply comes from external sources — the short-term focus is on meeting energy demand regardless of the carbon footprint of each energy source. Liquefied natural gas is being imported, and coal-fired power plants are increasing production. At the same time, however, high prices of fossil fuels are spurring massive public and private investment in renewables and conservation. Even more, governments are signaling they understand the role renewables and nuclear power must play in achieving energy security. As a result, despite the short-term delay, the green transition is bolstered in the medium term by the fallout from Russia's invasion.

The U.S. green transition is more politically charged, with energy security issues elsewhere used as justification by some to stay committed to "made in America" fossil fuels versus renewables. Despite the debate, Democrats led the passing of a sizeable climate package recently thought dead, accelerating the U.S.'s green transition (though more modestly than previously sought). Unanimous Republican opposition threatens the pace of transition beyond the current administration. However, with supply and demand likely to keep fossil fuel prices high, the resulting cost-parity equation will likely facilitate a continued natural shift toward renewables — particularly in areas like wind and solar as well as electric vehicles.

EXHIBIT 6: WHERE DO THEY GET THE ENERGY?

Fossil fuels still dominate energy portfolios — but we believe green (and nuclear) sources will continue to grow.

Energy Mix by Country (%)



Source: Northern Trust Asset Management, International Energy Agency. Data as of 2019, the most recently available data. Data labels show percent fossil fuels.

NOT SO NEGATIVE

The post-Global Financial Crisis (GFC) era of ultra-accommodative policy has come to a close as central banks have sharply pivoted to tightening in the wake of higher inflation. Nearly all central banks have exited zero/negative interest rate policy — with the Bank of Japan the lone holdout. We expect yield curves to remain relatively flat compared to history, but this still leaves interest rates higher than observed in most of the past decade. The percentage of negative-yielding debt has dropped from over 25% in 2020 to 3% more recently (see Exhibit 7). Even though expected cash returns still imply slightly negative rates on a real (after inflation) basis, the departure from negative rates should help economic functioning and provide a return to normalcy to a variety of economic actors, including savers and financial institutions. Longer term, this is likely a positive from an economic standpoint, but it's important to note uncertainty around central bank reaction functions is high as policymakers must adapt to the new backdrop, balancing growth and inflation considerations amid ongoing geopolitical shifts.

Nearly all central banks have exited zero/negative interest rate policy — with the Bank of Japan the lone holdout.

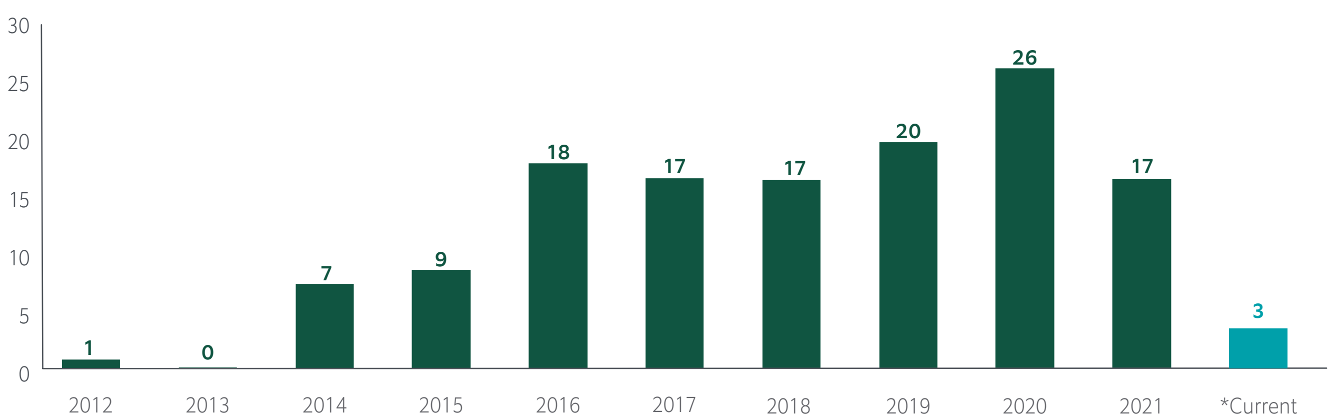
The most direct implication of this paradigm shift is higher expected returns from cash — both in the absolute sense and relative to other asset classes versus recent years. On the surface, this may not appear significant as our risk asset forecasts still outpace both cash and fixed income. However, this is a key distinction versus the prior post-GFC environment because investors now must consider a different opportunity set of risk and reward across the spectrum of asset classes.

The change in approach for central banks, as well as increased geopolitical uncertainty, may increase volatility for the risk asset outlook. This element plus higher interest rates are likely to cap the upside for equity valuations, while demand for risk assets in different market backdrops may evolve given we expect the opportunity cost of holding cash and fixed income versus risk assets to be much lower than in the past decade. Risk assets should still provide positive returns broadly speaking, but those specific asset classes that provide additional facets of exposure such as yield, volatility reduction or inflation protection may be more attractive to investors.

EXHIBIT 7: NEGATIVE YIELDS IN THE REARVIEW MIRROR

The central bank shift to tighter policy lowers the expected return premium for risk assets versus cash.

Percentage of Negative-Yielding Global Investment Grade Debt (% of total)



Source: Northern Trust Asset Management, Bloomberg. Year-end data from 2012 through 2021; *Current as of 6/30/2022.

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.

Inflation Recalibration will likely put some pressure on profit margins, but high yield's improved quality mix and benign maturity schedule should keep the default rate at or even modestly below long-run averages.

Interest Rate Expectations

While *Inflation Recalibration* and *Monetary Drought* set the stage for short-end rates to move (and stay) higher, *Slow Growth Transitions* will likely cap longer term rates at fairly low levels by most historical comparisons. U.S. rates in particular should also be capped by demographics and insatiable fixed income demand globally. Exhibit 8 shows a simplified (3-month to 10-year) yield curve, comparing our five-year interest rate forecasts against market expectations and current levels in the U.S., Germany (proxying Europe) and Japan. We expect U.S. interest rates to stay the highest of the major regions — but all rates to finally be positive.

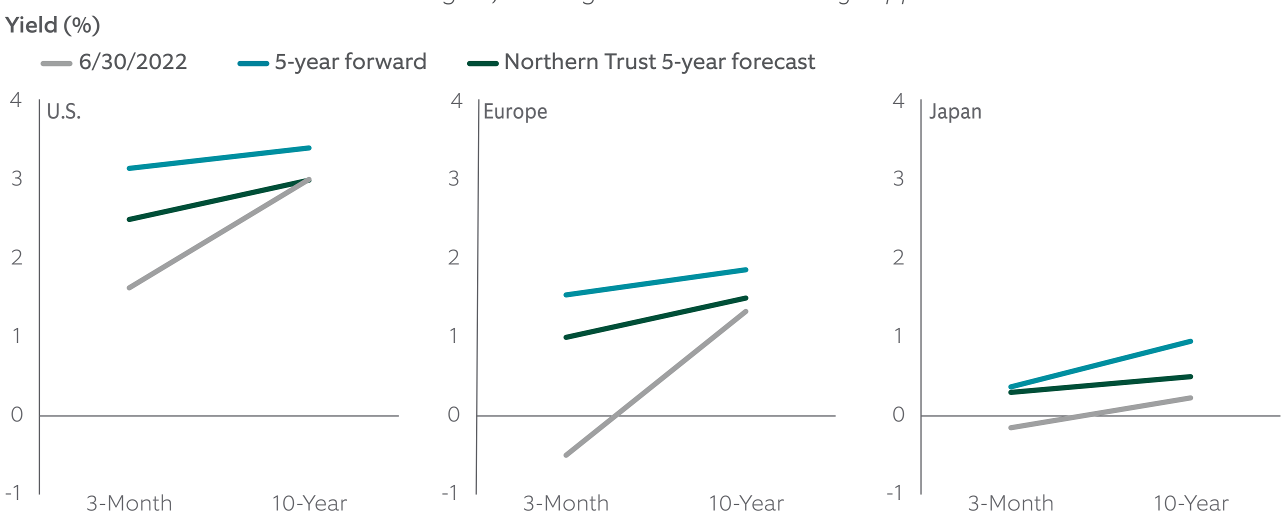
Credit Spread Expectations

Credit spreads may stay near long-run averages as stable-to-solid fundamentals face modest drag from *Slow Growth Transitions*. *Inflation Recalibration* will likely put some pressure on profit margins, but high yield's improved quality mix and benign maturity schedule should keep the default rate at or even modestly below long-run averages. We expect default rates to move up from current record low levels as growth prospects slow — accompanied by some credit spread widening in certain areas amid a backdrop defined by *Monetary Drought*.

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

EXHIBIT 8: LOWER FOR NO LONGER (BUT NOT HIGH EITHER)

We believe short-end rates will move higher, but long-end rates have mostly capped out.



Source: Northern Trust Asset Management, Bloomberg, as of 6/30/2022. German yields, often cited as the euro area benchmark, are used as a proxy for Europe.

Cash Return Forecasts

As we leave zero/negative interest rate policy in a more sustained way, cash return forecasts have moved higher across the board. We forecast a 2.8% return in the U.S., even higher returns in Canada (3.3%) and Australia (3.2%), and lower (but positive) returns in the U.K. (2.1%), Europe (0.3%) and Japan (0.1%).

We expect returns to match yield to maturities.

Inflation-Linked Return Forecasts

With *Stuckflation* moving to *Inflation Recalibration* and inflation expectations more aligned with current market pricing, inflation-linked bond returns are expected to closely mirror Treasury returns of similar duration. Specific forecasts range from 3.4% and 3.5% on the high side (U.S. and Canada, respectively) to 0.1% on the low side (Japan). Europe (2.2%) and the U.K. (3.3%) fall within this range.

Investment Grade Return Forecasts

Over the past 40 years, the five-year annualized U.S. investment grade return has bested the starting-point yield by a 0.6% annual average. This "outperformance" has been driven by generally positive yield curves and the perpetual nature of fixed income indexes (new higher yielding bonds replace lower yielding maturing bonds). Today's yield curves are mostly flat (taking away that "roll yield"), while our interest rate forecasts mostly match market expectations (reducing the potential for capital appreciation). All said, we expect returns to match yield to maturities.

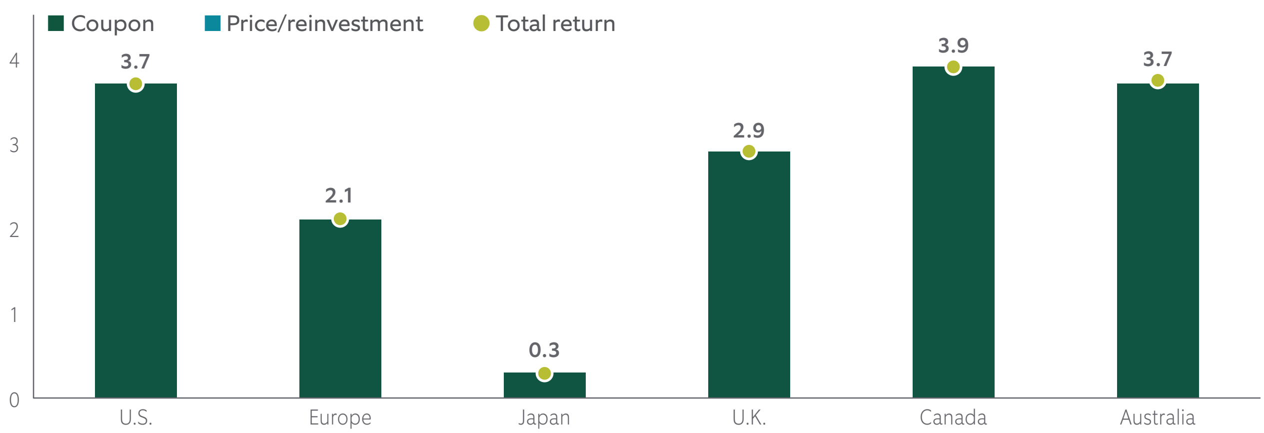
High-Yield Return Forecasts

Credit (default) risk shows most in high yield, where five-year returns have trailed starting-point yields by a historical average of 1.3%. Over the next five years, *Slow Growth Transitions* may act as a headwind — but better index quality, solid interest coverage ratios and reduced issuance may prevent a materially worse outcome. A 2% cut to the June 30 yield of 9.5% results in a 7.5% global high yield forecast.

EXHIBIT 9: CLIPPING COUPONS

Flat yield curves and appropriately priced securities mean returns will likely match yield to maturities.

Northern Trust Five-Year Annualized Investment-Grade Fixed Income Return Forecast by Country (%)



Source: Northern Trust Asset Management, Bloomberg. Coupon return calculated as yield to worst on 6/30/2022.

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 36% of next-five-year (and 80% of next-10-year) total return variability. This year, our quantitative process predicts a 4.5% annualized return. Historically, we have forecasted a higher return, benefiting from an expectation that valuations would move higher in a low interest rate world. With our *Not So Negative* theme, valuations have lost some of that low interest rate support — but how much?

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 1.6% annualized excess return.[3] But, more recently, this return premium has been negative — will this continue?

Our forward-looking thematic views — applied to the key equity forecast building blocks listed below — help us answer the questions posed above.

Our forward-looking thematic views are applied to the key equity forecast building blocks.

Key Forecast Building Blocks

1. **Revenue growth** is based on our nominal economic growth forecasts weighted by each equity index's geographic exposures.

2. **Profit translation** represents companies' ability to turn revenues into per-share earnings through profit margins and share count (repurchases/issuance).

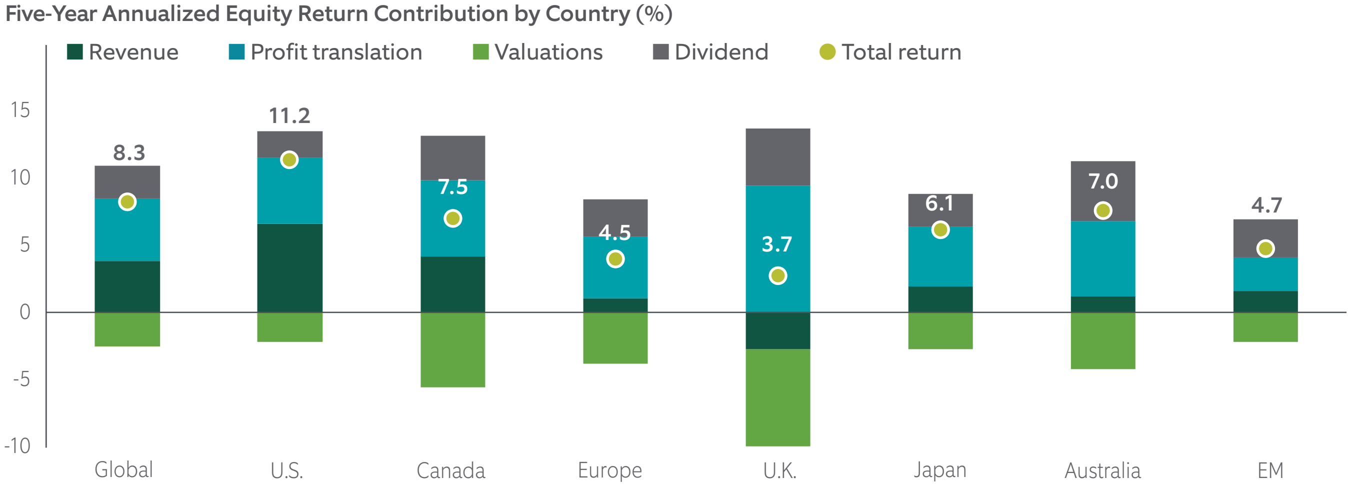
3. **Valuation impact** is based on expected changes in price-to-earnings ratios, which better align with our "building block" forecasting approach than the cash flow yields we use in our quantitative process (the two are highly correlated).

4. **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: PAST FIVE-YEAR RETURNS WERE STRONG

Mostly decent revenues and strong profit translation overcame some valuation headwinds.

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



Source: Northern Trust Asset Management, Bloomberg. Data from 6/30/2017 through 6/30/2022. 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 five-year annualized forecast for developed market equities is 6.2% — compared to the 8.8% return of the past five years. Interestingly, higher inflation increases the revenue opportunity set — as company sales are driven by nominal (not real) growth rates. In fact, we expect better revenue growth the next five years (5.1%, annualized, as are all other growth rates below) than the last five (4.0%) — thanks to this inflationary push. But what matters is the bottom line — and the same inflationary forces helping revenues also hurt expense control and ultimately determine profit margins. With profit margins at historically high levels (11.8%), we anticipate some deterioration in the tougher environment ahead. Accordingly, we lowered profit margin expectations to ~11% — still above the historical average of 8.7% (data from 2005). All said, profit translation is a swing factor in the last five years versus the next five — a 5.0% boost turns into a 2.4% drag. Valuations — due partly to *Not So Negative* — are coming off the highs of recent years. But we still (perhaps conservatively) expect equilibrium valuations (we forecast ~15x forward earnings) to be above current levels (14.5x) and historical averages (14.7x). Therefore, valuations should provide a 0.8% boost to total returns. Adding a 2.1% annual dividend yield leads to the 6.2% total return forecast.

With developed market corporate profit margins at historically high levels, we anticipate some deterioration in the more challenging environment ahead.

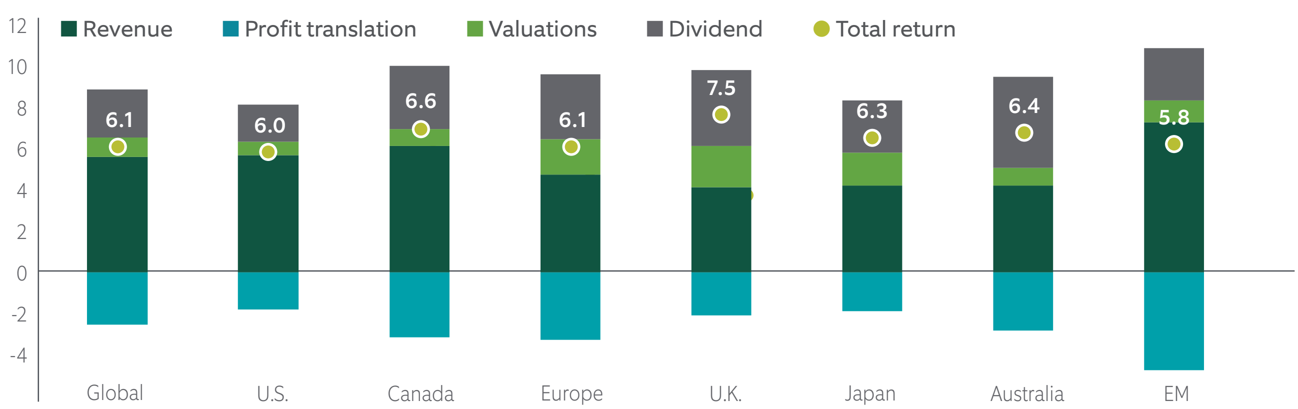
Emerging Market Return Forecasts

Emerging market (EM) equity discussions revolve around China — not just how its ~35% weight affects broader asset class returns, but also how to think of China in a global portfolio (with solutions ranging from separating it from other EM countries to omitting it). Uncertainties — both economic and financial — prompt us to expect low valuations (~11x forward earnings) will largely remain, offering a small 1% tailwind. Meanwhile, potential revenue growth remains high (6.9%), but chronic and continued share dilution and aforementioned profit margin pressures take a good cut (-4.5%). With a 2.4% dividend yield, we arrive at a 5.8% forecast.

EXHIBIT 11: NEXT-FIVE-YEAR FORECASTS ARE LOWER — BUT ACCEPTABLE

We think high profit margins will shrink, but lower valuations will revert higher — allowing decent returns.

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



Source: Northern Trust Asset Management. EM is emerging markets.

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, listed infrastructure 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 review in the context of our forward-looking themes. For instance, the 6.0% global listed infrastructure forecast comprises contributions from market (global equity) and term (interest rate) risk exposures of 3.1% and 0.2%, respectively — plus our 2.8% cash forecast (originally stripped out of the factor return above).

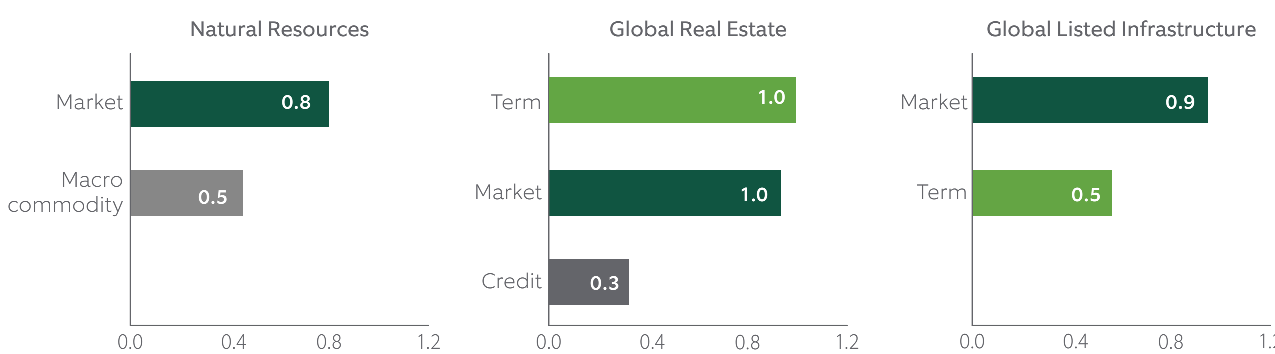
This historically based quantitative analysis is subject to our forward-looking thematic views. The next page focuses on what our themes mean for the asset class relationships to the various risk factors (the betas in Exhibit 12) and ultimate return forecasts. Any modifications to the quantitative model results are captured by a qualitative return adjustment (shown in Exhibit 13). This year, we applied a qualitative overlay to natural resources and global real estate.

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: UNDERSTANDING EXPOSURES

All real assets have notable market (equity) exposure, but with a mix of other exposures also present.

Real Asset Factor Exposure (Beta)



Source: Northern Trust Asset Management, Bloomberg. Regressions calculating factor exposure (beta) run from 12/31/2002 to 3/31/2022. 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.

Natural Resources

Natural resources are a clear beneficiary of the Russia-Ukraine war. A meaningful portion of supply taken offline (*Inflation Recalibration*) and increased demand to secure critical resources (*Regional Rebuilding Blocs*) should support commodity prices for years. And these impacts are just the icing on the cake. Reduced investment has underpinned tight commodity markets for years now. *Green Transition Still a Go* may continue to cap longer term financial incentives for capital investment in "dirty" resources, but it does at least recognize the need for an "all of the above" energy strategy. *Slow Growth Transitions* are unlikely to outweigh these tailwinds, which warrant a +1% adjustment when taken together.

A meaningful portion of supply taken offline and increased demand to secure critical resources should support commodity prices for years.

Global Real Estate

Office space remains challenged by the work-from-home trend and the retail property sector by e-commerce. However, such challenges are creating opportunity. Less-needed office and retail space will continue to be repurposed into spaces with higher return on investment (fulfillment centers, residential spaces). But repurposing takes time, and *Not So Negative* interest rates may act as somewhat of a drag. So, as the global real estate recovery story gains traction, we maintain a -1% adjustment.

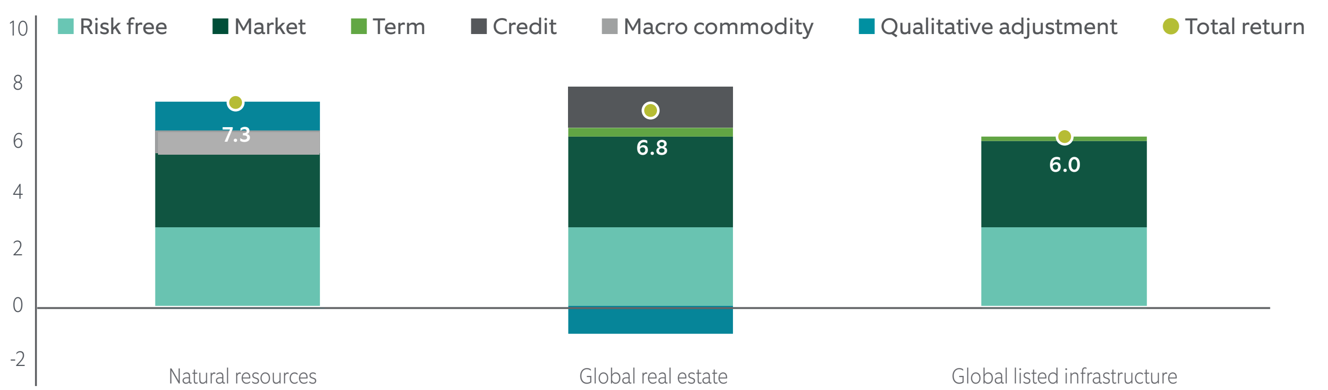
Global Listed Infrastructure

Listed infrastructure's historical downside protection properties will likely be valued in a potentially higher-volatility regime (*Not So Negative*). Elevated commodity prices should provide some support for the asset class (~60% energy and utilities). Its remaining composition (industrials) stands to benefit from the reshuffling of supply chains (*Regional Rebuilding Blocs*). Higher interest rates may weigh on the asset class a bit, but with those higher rates will also come more attractive income yields.

EXHIBIT 13: DIVERSIFICATION ON DISPLAY

Real assets should shine in a more uncertain and higher inflationary risk regime.

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



Source: Northern Trust Asset Management, Bloomberg.

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 simply assume our alternative investments will maintain the broad industry's historically realized alpha, as determined through risk factor modeling.

Private equity, broadly speaking, continues to offer material return premiums.

Private Investments

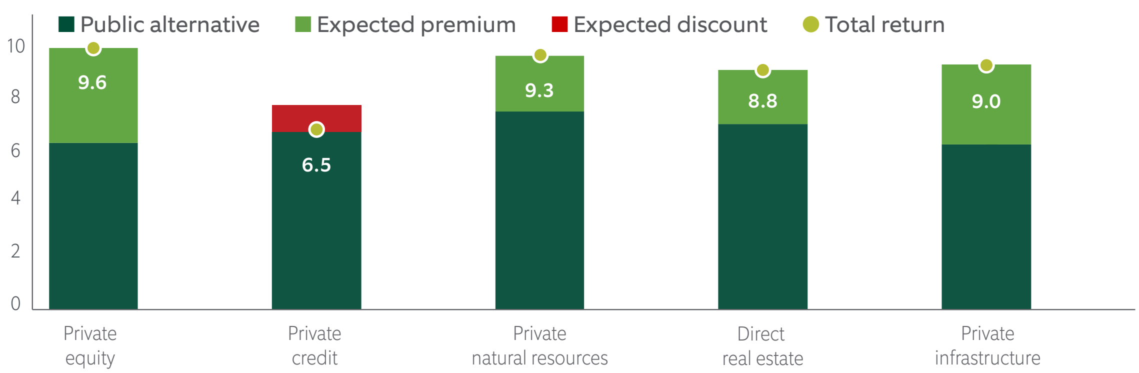
The private investment universe spans the capital structure (from credit to equity) and across all risk assets. We develop our private investment forecasts in the form of return premiums to associated public market return forecasts (e.g., private credit versus high yield). This premium is derived from the respective alphas, which are found by regressing the respective private market returns on their public market counterparts. Importantly, we capture delayed appraisals through a series of lagged market independent variables in the regression model.

Private equity, broadly speaking, continues to offer material return premiums. Our 9.6% return forecast is driven by a 3.5% return premium, which was a 2% "haircut" from the historically realized 5.5% return premium — done to address the (we believe modest) concerns over the increased amount of money flowing in to capture potentially reduced investment opportunities. We believe attractive opportunities remain, but they are capturing higher prices so that a haircut is warranted. Using a similar approach, we calculate return premiums across private real assets. We assign a 2% premium to our public equity-based natural resources forecast to arrive at a 9.3% total return expectation. Direct real estate also earns a 2% premium (8.8% total return forecast), while private infrastructure earns a 3% premium (9.0%). The private credit data implies a 2% premium — but adding that to our already-elevated (for uniquely public market reasons) high yield forecast is the wrong comparison at the moment. Our 6.5% private credit forecast is more appropriately compared to our 9.6% private equity forecast.

EXHIBIT 14: FOUR PREMIUMS AND A DISCOUNT

Private credit — still an attractive income provider — has a difficult comparison with high yield.

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



Source: Northern Trust Asset Management, Bloomberg.

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 lagged market factor), credit (default risk) and term (interest rate risk). We use data going back to 2002, the earliest available data for all relevant asset classes and risk factors. Hedge fund strategies can benefit the portfolio through “true” alpha (truly adjusting for all risk exposures) or through “esoteric beta” (risk exposures not available to the average investor). We are only adjusting for those cheaply captured betas, so any esoteric beta will be grouped with alpha (as it effectively is in this case). The average hedge fund has provided a historical alpha of 0.9% — which, when added to the risk exposure return contribution, equals a 5.4% forecast.

The average hedge fund has provided a historical alpha of 0.9%.

The long-term alpha masks an interesting evolution of hedge fund alpha over time. We calculated alpha by decade in Exhibit 15. Alpha generation had been in 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, alpha has increased to 3.8%. The blend of more alpha and lower return premiums (as cash returns creep higher) has increased hedge funds’ potential role in the diversified portfolio for cases where hedge fund investing is appropriate.

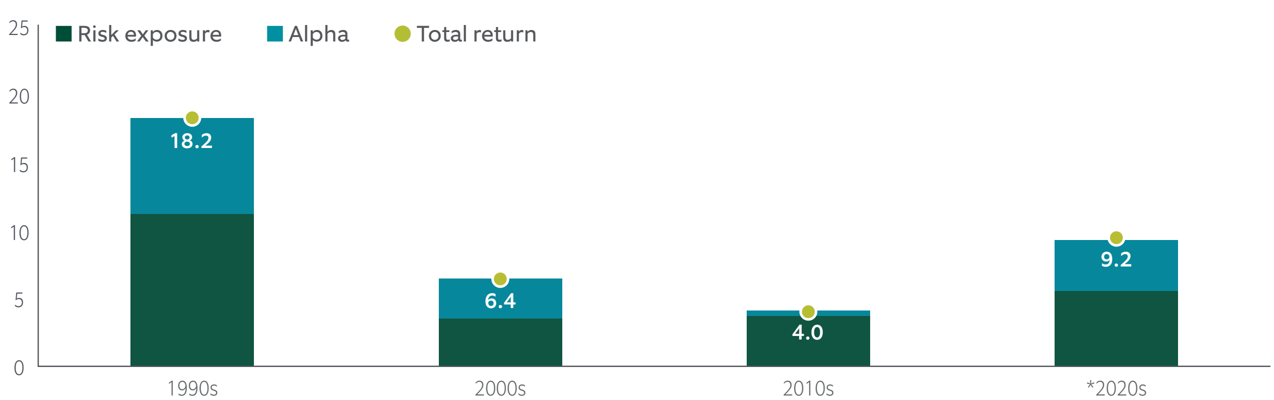
A Note on Alternative Forecasts

Alternative asset class indexes — generally an average of a universe of strategies — are not “accessible” the way the public indexes are. Further, 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 also be thought of as what to expect in the market outlook we envision.

EXHIBIT 15: ALPHA THROUGH THE DECADES

Only a couple years in, this decade has seen better alpha generation than the previous decade.

Hedge Fund Return Contribution by Decade (%)



Source: Northern Trust Asset Management, Bloomberg. Data from 12/31/1990 to 3/31/2022. *2020s through 3/31/2022. Past performance is no guarantee of future results.

HOW HAVE WE DONE?

We are frequently asked about the accuracy of our five-year forecasts. In response, we offer Exhibit 16 to compare our five-year forecasts from five years ago versus actual results. We review our accuracy across the major asset classes: cash, fixed income (both investment grade and high yield) and equities (both developed and emerging markets). We then aggregate and review at the portfolio level — including the risk asset portfolio, the risk-control portfolio and the strategic asset allocation portfolio (SAA, a balanced mix of the two component portfolios). In addition, on the next page we provide the five-year actual returns alongside the five-year forecasts from our 2017 effort across all asset classes and all regions within each asset class.

Our five-year forecasts from 2017 proved too optimistic in the fixed income arena. Nearly all of the fixed income shortfall was a consequence of the past year's rising interest rates — at this time last year, four years into the forecast, global investment grade was on pace for a 3.9% total return (versus our 3.2% forecast) while global high yield had earned 5.2% annually (versus our 4.5% forecast). In equity markets, our 2017 five-year forecast was too pessimistic on developed market returns (mostly due to the strong U.S. equity returns coming in at 11.2% versus a 5.9% forecast) and too optimistic on emerging market equities.

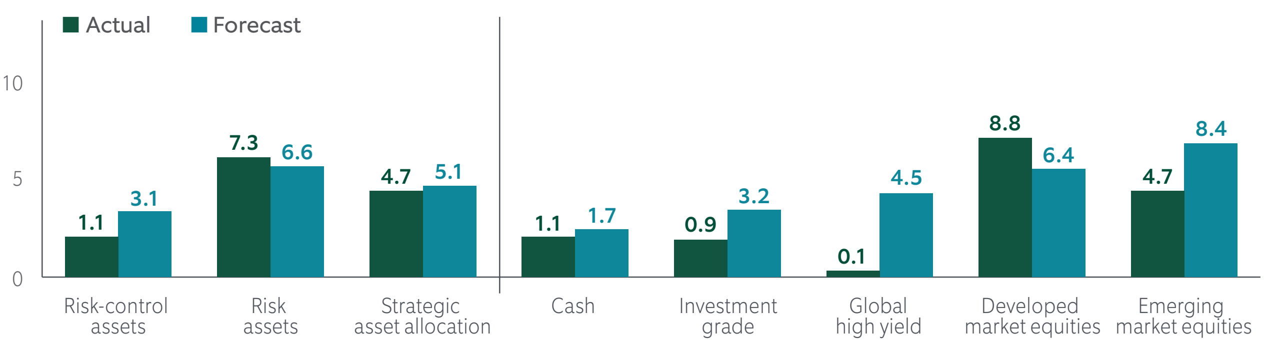
At the portfolio level, too-optimistic risk-control forecasts more than offset too-pessimistic risk asset forecasts, which put our 5.1% 2017 SAA forecast somewhat above the 4.7% actual. The risk asset portfolio's actual return (7.3%) outpaced our forecast (6.6%) thanks partly to the 11.2% U.S. equity return — but also to the strength of natural resources (earning an 8.9% return against an already-elevated 7.4% return forecast); at the time of that forecast, natural resources (NR) had earned a -1.6% return annually the previous five years. A couple of "lessons learned" here: 1) NR has fulfilled its role in a five-year period characterized by growing (and ultimately problematic) inflation pressures; 2) as the saying goes, past performance does not guarantee future results.

At the portfolio level, too-optimistic risk-control forecasts more than offset too-pessimistic risk asset forecasts.

EXHIBIT 16: BOGGED DOWN BY BONDS

The past year of rising interest rates has resulted in missed forecasts in fixed income markets.

Five-Year Annualized Returns 2017-2022 (%)



Source: Northern Trust Asset Management, Bloomberg. Actual return data from 6/30/2017 - 6/30/2022. Forecasted returns as of 6/30/2017. Risk-control assets = cash, investment-grade fixed income and Treasury inflation-protected securities. Risk assets = high yield bonds, U.S. equities, developed ex-U.S. equities, emerging market equities, global natural resources, global real estate and global listed infrastructure. SAA = Strategic Asset Allocation. SAA is made up of a combination of risk-control and risk assets. Returns are displayed in local currency. Past performance does not guarantee future results.

DETAILED FIVE-YEAR ASSET CLASS RETURN FORECASTS

All Returns in % Annualized				5-Year Return Forecasts by CMA Year						5-Year Actual Return
		Asset Class	Proxy Index	2023	2022	2021*	2019	2018	2017	
Fixed Income	U.S.	Cash	3-Month U.S. T-Bill	2.8	0.3	0.1	1.1	2.2	1.7	1.1
		Inflation linked	Bloomberg U.S. TIPS	3.4	2.2	2.4	2.6	2.9	3.0	3.2
		Investment grade	Bloomberg U.S. Aggregate	3.7	2.4	2.3	3.0	3.6	3.2	0.9
		High yield	Bloomberg U.S. High Yield	7.4	3.5	5.5	5.0	4.9	4.8	2.1
		Municipal	Bloomberg Municipal	3.2	2.0	2.6	2.4	3.2	3.2	1.5
	Canada	Cash	3-Month Canada T-Bill	3.3	0.2	0.2	0.7	1.6	1.3	1.0
		Inflation linked	FTSE Canada Real Return Bond	3.5	2.0	2.2	2.0	2.3	2.5	0.7
		Investment grade	FTSE Canada Universe	3.9	2.4	1.9	2.6	2.9	2.5	0.2
		High yield	BofAML Canadian High Yield	6.0	3.8	5.2	4.5	4.5	4.5	4.0
	Europe	Cash	3-Month German Bunds	0.3	-0.4	-0.5	-0.3	-0.3	-0.2	-0.7
		Inflation linked	Bloomberg Euro Inf. Linked	2.2	1.0	1.5	1.0	1.2	1.5	2.3
		Investment grade	Bloomberg Euro Aggregate	2.1	1.0	1.0	1.2	1.8	1.5	-0.9
	U.K.	Cash	3-Month Gilts	2.1	0.2	0.1	0.3	0.9	0.5	0.5
		Inflation linked	Bloomberg Inflation Linked Gilt	3.3	1.0	1.3	2.2	1.7	1.6	-0.5
		Investment grade	Bloomberg Sterling Aggregate	2.9	1.5	1.3	2.2	2.5	2.5	-0.6
	Japan	Cash	3-Month JGB	0.1	-0.1	-0.1	-0.1	0.0	-0.1	-0.2
		Inflation linked	Bloomberg Inflation Linked JGB	0.1	0.2	0.5	0.2	0.5	0.8	0.8
		Investment grade	Bloomberg Japanese Aggregate	0.3	0.2	0.2	0.2	0.5	0.7	-0.3
	Aus.	Cash	3-Month Australia Gov't Bond	3.2	0.3	0.2	0.8	2.5	2.4	1.0
		Investment grade	Bloomberg Australian Composite	3.7	1.5	1.2	2.2	3.5	3.2	0.7
	Global	Inflation linked	Bloomberg Global Inflation Linked	2.9	1.5	1.8	2.0	2.0	2.2	2.5
		Investment grade	Bloomberg Global Aggregate	2.7	1.6	1.6	2.1	2.7	2.2	1.2
		High yield	Bloomberg Global High Yield	7.5	4.0	5.6	4.8	4.6	4.5	0.1
Equities	Developed markets	U.S.	MSCI United States	6.0	4.3	4.7	5.7	5.8	5.9	11.2
		Canada	MSCI Canada	6.6	5.2	4.5	4.5	5.5	6.0	7.5
		Europe	MSCI Europe ex U.K.	6.1	4.7	5.4	6.0	6.3	7.2	4.5
		U.K.	MSCI United Kingdom	7.5	6.2	5.6	7.4	6.3	6.6	3.7
		Japan	MSCI Japan	6.3	4.1	3.8	4.5	6.0	6.0	6.1
		Australia	MSCI Australia	6.4	4.7	5.8	5.7	7.7	7.7	7.0
	Agg.	Developed markets	MSCI World	6.2	4.5	4.8	5.7	6.0	6.4	8.8
		Emerging markets	MSCI Emerging Markets	5.8	5.3	5.4	6.1	8.3	8.4	4.7
		Global equities	MSCI All Country World	6.1	4.6	4.9	5.8	6.2	6.9	8.3
Real	Global	Natural resources	S&P Global Natural Resources	7.3	5.0	3.6	6.1	7.2	7.4	8.9
		Listed real estate	MSCI ACWI IMI Core Real Estate	6.8	5.1	6.3	6.3	6.0	6.1	2.5
		Listed infrastructure	S&P Global Infrastructure	6.0	5.5	5.8	5.8	5.4	5.8	4.8
Alts		Private equity	Cambridge Global Private Equity	9.6	7.6	7.9	7.7	8.0	8.4	N/A
		Private credit	Cambridge Global Private Credit	6.5	6.0	7.6	6.8	6.6	6.5	N/A
		Hedge funds	HFRI Fund Weighted Comp	5.4	2.9	2.6	3.7	4.3	4.4	5.7

*Naming convention of five-year outlook was changed to the forward year, so the 2021 edition was published in 2020. For each CMA edition, the five-year forecast period is as follows in parentheses: 2023 (6/30/2022-6/30/2027), 2022 (6/30/2021-6/30/2026), 2021 (6/30/2020-6/30/2025), 2019 (6/30/2019-6/30/2024), 2018 (6/30/2018-6/30/2023), 2017 (6/30/2017-6/30/2022). 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. Five-year actual returns are listed in local currency (with the exception of real assets, which are in USD) and annualized for the five-year period ending 6/30/2022. 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 no guarantee of future results.

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 — guides our expectations for five-year 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

Principles that Endure

Through our expertise and dedication, we transform the plans of the world's most successful individuals, families and institutions into action to help our clients reach their most ambitious goals. Spanning decades and generations, our longevity comes from the recognition that we are more than a financial institution. We are active participants in our communities, global leaders in business and philanthropy and thoughtful architects of innovative employee benefit and support programs.

Founded in Chicago in 1889, Northern Trust has a global presence with offices in 23 U.S. states and Washington, D.C., and across 23 locations in Canada, Europe, the Middle East and the Asia-Pacific region. As of June 30, 2022, Northern Trust had assets under custody/administration of US $13.7 trillion, and assets under management of US $1.3 trillion. For more than 130 years, Northern Trust has earned distinction as an industry leader for exceptional service, financial expertise, integrity and innovation.

Footnotes

[1] Source: Brookings Institution, 2020

[2] Source: JP Morgan, Bloomberg, 2020

[3] Correlation and excess return were calculated using the MSCI World Index and MSCI Emerging Markets Index, from 12/31/1987 to 6/30/2022.

Contributors

DAN PHILLIPS, CFA
Director, Asset Allocation Strategy
CMA Working Group Chair

DAN BALLANTINE, CFA
Investment Strategist

RYAN BOYLE
Senior Economist

MARK CARLSON, CFA
Senior Investment Strategist , Fixed Income

COLIN CHEESMAN, CFA
Senior Investment Analyst

MICHAEL DE JUAN
Director, Portfolio Strategy

DAN FARRELL
Director, EMEA Cash Management

CHRIS HUEMMER, CFA
Senior Investment Strategist , Equities

MICHAEL HUNSTAD, PH.D.
Chief Investment Officer, Global Equities

TIM JOHNSON
Head of Portfolio Solutions,
Global Fixed Income

ERIC LEE, CFA
Investment Strategist

ANGELO MANIOUDAKIS
Chief Investment Officer

JIM MCDONALD
Chief Investment Strategist

JULIE MORET
Global Head of Sustainable Investing
and Stewardship

KATIE NIXON, CFA
Chief Investment Officer
Wealth Management

DAN PERSONETTE, CFA
Director, Interest Rate Strategy

BRAD PETERSON, CFA
National Portfolio Advisor
Wealth Management

COLIN ROBERTSON
Co-Head of Fixed Income

CHRIS SHIPLEY
Chief Investment Strategist, North America

WOUTER STURKENBOOM, CFA
Chief Investment Strategist,
EMEA and APAC

THOMAS SWANEY
Chief Investment Officer,
Global Fixed Income

CARL TANNENBAUM
Chief Economist

ERIC WILLIAMS
Director, Credit Strategy

PETER YI, CFA
Director, Cash Management

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