NORTHERN TRUST

CAPITAL MARKET ASSUMPTIONS

FIVE-YEAR OUTLOOK: 2018 EDITION

After a year of strong risk asset returns and some increase in global interest rates, financial markets remain supported by many of the same themes we detailed last year. While the theme titles have evolved in many cases to capture shifting and subtle nuances, the broader expectation for continued economic growth, controlled inflation and accommodative monetary policy is expected to result in good-but-not-great risk asset returns and low-but-mostly-positive fixed income returns.

Presenting our Five-Year Themes:

1 | **MILD GROWTH MYOPIA** — Subdued economic cycles and stronger financial systems will push out the next recession and limit its severity.

2 | **STUCKFLATION** — Low and durable structural inflation has altered both monetary policymaking and investor behaviors.

3 | **PASS/FAIL MONETARISM** — Without a template for policy normalization, central banks' efforts cannot be graded — other than that they must not fail.

4 | **TECHNOLOGY SLOWZONE** — Technology has been pulled into the orbit of government meddling but will remain a constructive economic force.

5 | **GLOBAL (RE)POSITIONING SYSTEM** — The irreversible fade of legacy multilateral institutions is creating as many investment opportunities as risks.

6 | **EXECUTIVE POWER DRIVE** — Investors are accepting leaders who challenge political norms in order to favorably tilt the economic landscape.

2018 CMA FIVE-YEAR THEMES OVERVIEW

Mild Growth Myopia

Subdued economic cycles and stronger financial systems will push out the next recession and limit its severity.

Many lament that the global economy seems stuck on a slow growth trajectory. They are short-sighted. The same forces keeping a lid on growth have also buffered downturns and extended the cycle itself. The service economy's steady expansion smooths out cycle peaks and valleys the same way that gradually removing monetary stimulus balances fiscal policy limitations. Nearly 10 years into the U.S. expansion, the cycle has matured and recession odds have risen — but the onset of a slowdown will be later and less threatening than suggested by the standard playbook.

Stuckflation

Low and durable structural inflation has altered both monetary policymaking and investor behaviors.

Most major central banks have fallen well short of their 2% annual targets over the past decade — and many of the supply-side forces behind the shortfall are only gaining traction. This is reflected in low interest rates and flattening yield curves. Technological innovations combined with vast troves of data are enhancing price discovery and optimization techniques globally. Monetary policy adjustments and trade frictions will produce uncertainties and pockets of inflation, but companies and consumers will continue to find ways to alleviate such pricing pressures.

Pass/Fail Monetarism

Without a template for policy normalization, central banks' efforts cannot be graded — but they must not fail.

Stuckflation and a boisterous political backdrop argue for under-the-radar monetary policymaking, but operating with uber-large financial market footprints makes this challenging. This is new territory, where only two grades exist: Pass or Fail. Monetary experts know recent business cycles ended because of financial instability — not high inflation. With stricter regulations this time around, a more cautious monetary path will be taken. Building "dry powder" too fast only to increase the odds that its use will become necessary is self-defeating.

Technology Slowzone

Technology has been pulled into the orbit of government meddling, but will remain a constructive economic force.

After being allowed to flourish without governmental interference in its business models and data collection endeavors, technology now finds itself in the political cross hairs. Social media data mining for political purposes has sparked deep angst over the integrity of democratic elections just as it is increasingly leveraged by politicians on a global level. A period of political maneuvering is now underway but technology's benefits are too great to be throttled for long. Tech will regain its swagger by adhering to revamped rules of the road.

Global (Re)Positioning System

The irreversible fade of legacy multilateral institutions is creating as many investment opportunities as risks.

Those left behind by globalism and information technology question whether western-style democracy can right the ship; they also have weak attachment to the post World War II institutional frameworks led by the United States. Global engagement will continue, but based on transactions-oriented instead of ideological frameworks. Investors appreciate that these new approaches will favor tech savvy and globally integrated corporate structures. Over time, the tug of war between free markets and managed capitalism will be resolved somewhere in the middle.

Executive Power Drive

Investors are accepting leaders who challenge political norms in order to favorably tilt the economic landscape.

Mainstream, rules-compliant politicians are in retreat everywhere as tech-enabled populists push strong leaders and new agendas onto the political stage. One truism embraced by all sides is that control of executive political power and technology are the most important levers for shaping the future economic landscape. Populism has often been described as a road to economic dysfunction. But for now, asset owners have accepted the movement and been rewarded with strong returns. Investors will likely stay supportive until populism runs its course.

FIVE-YEAR FORECAST SUMMARY

Fixed Income

The end of the 30-year-plus bull market does not mean the start of the next bear market. Interest rates will remain low.

Interest rates over the next five years will remain below investor expectations, driven by continued *Stuckflation*. With long-term interest rates anchored, the current Federal Reserve rate hike cycle will end earlier and at a lower level than is priced into the markets. Also controlling short-term U.S. rates is the ongoing accommodation from other major central banks in response to low inflation. The result will be a nearly flat U.S. yield curve and a very small shift upward in other yield curves around the world.

Credit spreads — both investment grade and high yield — will settle in at slightly higher levels than the lows seen this cycle. The ongoing economic expansion and still-low debt servicing costs continue to provide a foundation. We anticipate slightly higher fixed income returns than we did last year — supported by higher starting point yields, continued central bank accommodation and steady credit spreads.

Equities

Equity returns will be below long-term historical averages, but higher than what current valuations would predict.

Developed market equities will provide annualized returns in the mid-single digit range over the next five years. Valuations, while still elevated, retreated this past year as per share earnings grew faster than equity prices. We don't expect a tailwind from valuations during the next five years, but we don't expect a material headwind either. Ongoing but slower economic growth, per our *Mild Growth Myopia* theme, will provide modest support to revenues while share repurchases and *Stuckflation* will continue to support earnings.

Emerging market equities' valuations are below historical levels and continue to represent a longer-term buying opportunity. Higher growth, which should persist, and lower valuations should allow for a return premium over developed market equities. Our developed and emerging market equity forecasts are slightly below last year's expectations.

Real Assets

Real asset returns will be mostly in line with equities, providing diversification through different "flavors" of market risk.

Natural resource returns outpaced the broader global equity universe over the last year, but continue to trail significantly over the past 10 years. Ongoing global economic growth and better calibration between supply and demand will allow recent outperformance to persist.

Exposure to interest rate and credit risk will support global real estate. But negative investor sentiment remains as the real estate market is forced to respond to the more digitally based economy.

Global listed infrastructure can serve as a lower-risk (but also slightly lower-return) alternative to global real estate for income generation. The public-to-private transfer of infrastructure projects has opened up a new set of opportunities.

Alternatives

Alternatives — private equity and hedge funds — can enhance risk-adjusted portfolio returns through non-traditional means.

Investors have questioned expected private equity return premiums, given higher valuations and increased asset flows to private equity funds. Higher private market valuations over the past few years have been mostly — but not completely — in lockstep with higher public market valuations. Increased asset flows are finding increased opportunities as companies stay private longer.

Alpha — returns not explained by risk exposures — has been persistently shrinking in the hedge fund universe. Our low-single-digit hedge fund return expectation is driven by lower financial market returns and assumes this low average alpha, but we recognize the dispersion across individual strategies. Manager selection is paramount.

MILD GROWTH MYOPIA

Over the past couple of years, the global economy has switched to a higher gear, experiencing the first period of above-channel growth since the financial crisis. Many investors do not expect this to last — and we agree. But they also are focusing on the deep recession "inevitably" on the other side, which we don't expect. Instead of a risk, we see a growth slowdown as a continued enabler of the extended economic cycle thesis we first introduced four years ago in our *Enduring and Maturing Global Growth* (2014) theme.

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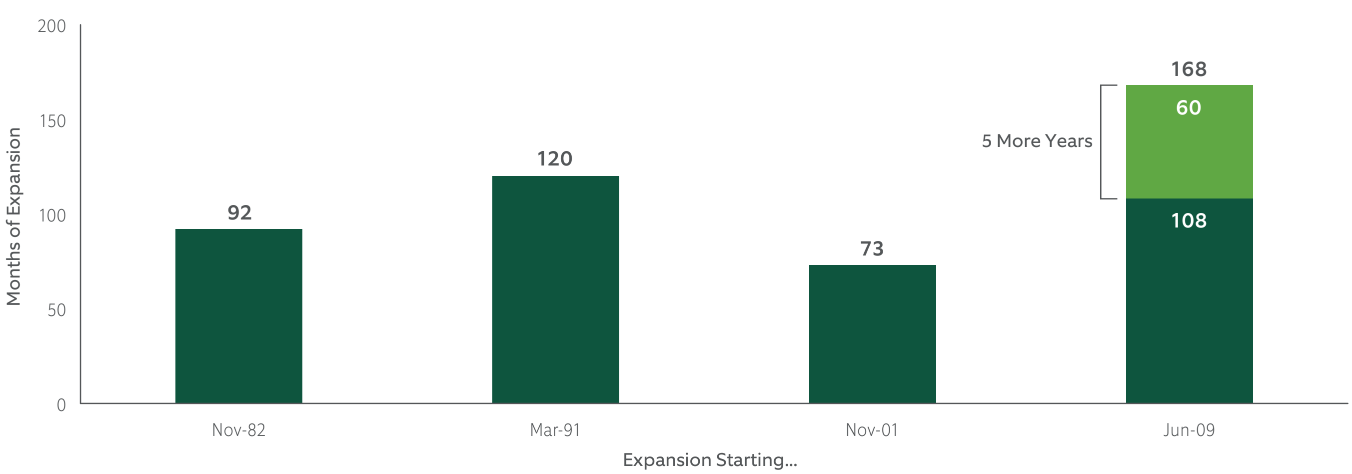
The global economy has a demand problem — driven by aging populations, transitioning emerging economies and elevated debt levels — not a supply problem, which has been ameliorated by technological advances. This keeps structural inflation contained — per our (now perennial) theme of *Stuckflation* (2016, 2017 and again in 2018 on page 6) — and monetary policy accommodative.

Those in the "recession is coming" camp point out that the length of this expansion means we are due. For instance, the current U.S. economic expansion just turned nine years old — one year shy of the longest expansion in post-WWII history (the 90s). However, when measured by cumulative growth, we still have a way to go. This expansion's 40% of nominal growth is just half of the cumulative output experienced during the Reagan and Clinton administrations (we try to stay bipartisan in our writing). Even if the U.S. economy grows for another five years at our expected nominal growth rate, it will still be just shy of the cumulative growth in those earlier expansions.

This is not to say that the odds of recession have not increased (they have), but the next recession is likely to be later and less severe than many believe. True, central banks have less fiscal and monetary ammunition to deploy in the next downturn, but they know this and will tread lightly (see *Pass/Fail Monetarism,* page 8). Also,

EXHIBIT 1: CURRENT U.S. EXPANSIONS: RECORD LENGTH...

Five more years of this U.S. economic expansion would be a post-WWII record.



Source: Northern Trust Global Asset Allocation, Bloomberg.

a stronger financial system lowers systemic risks while the continued shift to a service economy smooths out the "boom-bust" of yesteryear given the lower cyclicality service industries face.

We expect the global economy to experience annualized real (removing inflationary effects) growth of 2.5% over the next five years, a slight increase from last year's five-year forecast of 2.4%. The two largest economies in the world — the United States (25% of global gross domestic product [GDP]) and China (16%, when measured in U.S. dollar terms) — are expected to grow at an annual pace of 1.9% and 3.5% respectively. Recent U.S. fiscal stimulus (tax reform) will serve to elongate the current economic expansion but will not meaningfully alter the structural growth channel in which the United States has largely been confined over the past decade.

China's "official" growth numbers are likely overstated — but so is the risk of a debt-driven hard landing, given the benefits of a command-control economy in dealing with such issues. The "imminent" China hard landing has been flagged for some time — just as the "day of reckoning" for developed market debt levels has been flagged for decades. Barring a trade war escalation, we expect the slow moderation in Chinese growth to continue.

Meanwhile, the European Union (representing 19% of the global economy) is expected to grow at a 1.6% annualized pace, reflecting a continued monetary union (no eurozone breakup) but slow progress on unions of other sorts (fiscal, political, banking, etc.). In fact, the lack of progress Europe has made on addressing weaknesses in its banking sector, including the lack of a common deposit insurance scheme, materially exposes the region to another crisis should another recession take hold.

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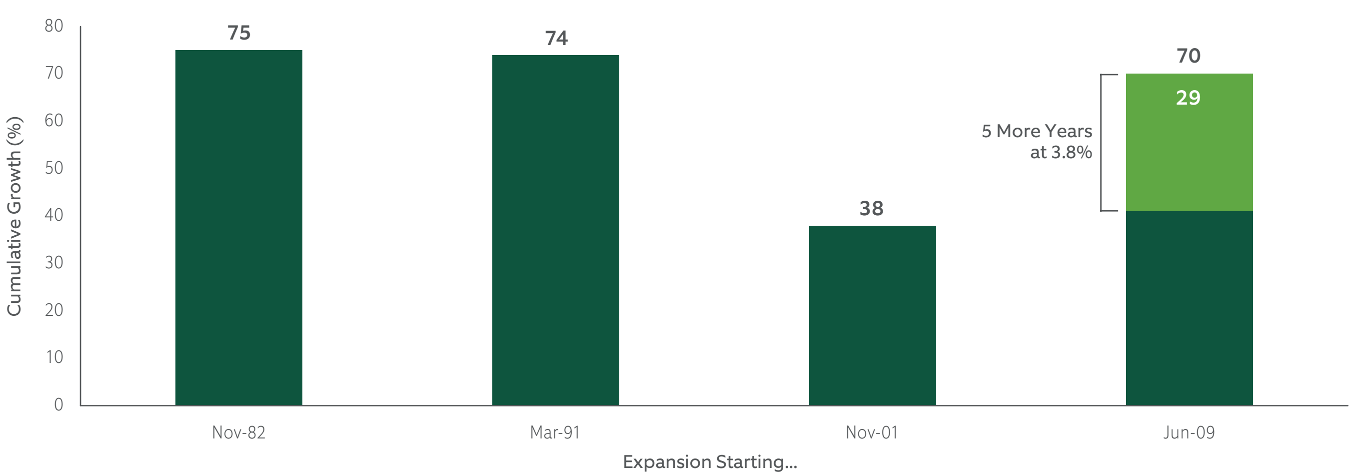
EXHIBIT 2: …BUT NOT RECORD MAGNITUDE

Even with five more years of growth, total output will still be shy of the expansions of the '80s and '90s.



Source: Northern Trust Global Asset Allocation, Bloomberg.

STUCKFLATION

Despite some cyclical increase in inflation data (largely due to increasing commodity prices and mostly confined to the United States), our *Stuckflation* theme remains in place as we look over our five-year investment horizon. Amazingly, after years of uber-accommodative monetary policy around the globe, core inflation levels remain persistently low in the world's biggest economies, including the United States (2.0% core year-over-year inflation), Europe (1.0%) and Japan (0.1%).

Compounding low inflation readings during the past 10 years has put most developed-market central banks far behind the 2% inflation rate generally targeted. As the charts show, even if U.S. consumer prices were to increase 5.8% overnight, they would only be at the level the Federal Reserve targeted and expected 10 years ago. With few exceptions, this dynamic has occurred across the globe — notably in Europe and Japan, where this "inflation deficit" has been 10.2% and 20.4% respectively.

The structural forces that have kept inflation low — including demographically hobbled demand and technology-enabled supply — are not going away. The impact of technology on supply can be felt in three general categories:

1. Automation;

2. Price discovery; and

3. Price optimization.

Automation has been with us since the industrial revolution — but its benefits continue. As technology continues to develop, automation — once mostly confined to the factory floor — is seeping into retail (order/checkout kiosks are in early stages of deployment) and office jobs (data reconciliation will slowly

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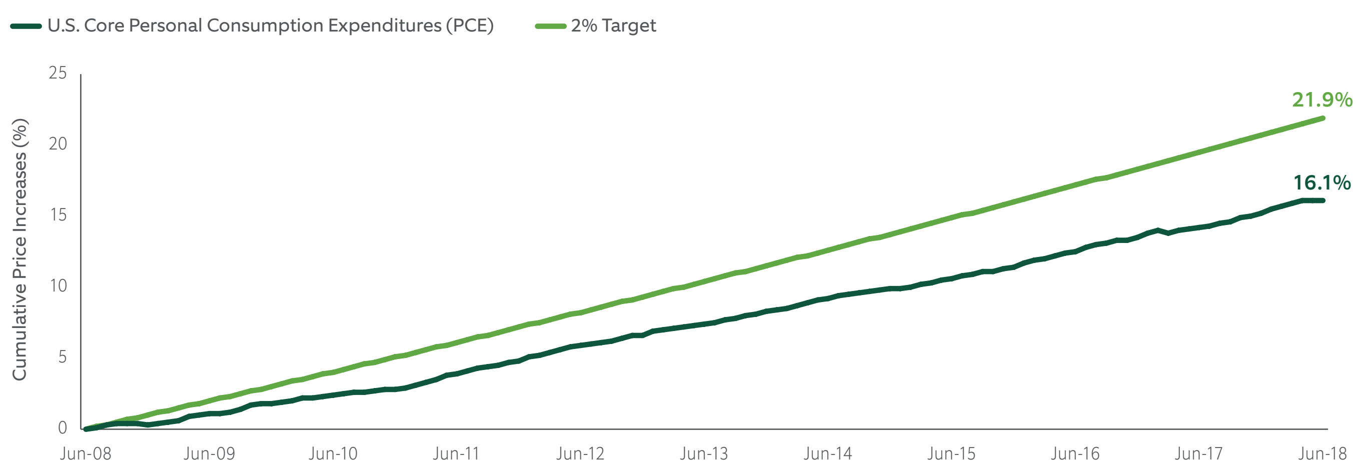
EXHIBIT 3: INFLATION FALLING BEHIND

U.S. prices have fallen well behind where they should be in the eyes of the Fed.



Source: Northern Trust Global Asset Allocation, Bloomberg. Data from 6/30/2008 to 6/30/2018.

be displaced by new technologies, such as blockchain). Meanwhile, the internet has vastly increased price discovery, which has made raising prices difficult; consumers quickly and effortlessly move to the lowest-cost provider.

While these first two areas are well understood by most, the third area — price optimization — is underappreciated. Big data will allow price discrimination in an increasing number of industries, meaning the same good can be priced according to the individual's demand curve (think airline seats today). Ultimately, this allows more efficient pricing, resulting in falling average costs. (Economists would call this removing dead weight loss.) The overarching theme here is that substitution — whether of input costs, goods or prices — promotes flexible markets and dampens inflationary pressures.

We expect inflation to remain tame around the world with five-year annualized inflation expectations ranging from 0.8% in Japan (generally structurally low) to 2.2% and 2.1% in the United Kingdom and Australia, respectively (generally structurally high). Rounding out the large developed economies, we expect inflation of 1.9% in the United States, 1.7% in Canada and 1.2% in Europe.

These expectations are fairly consistent with the experience of the past decade, and most remain below the general 2% central bank target. Continued uber-accommodative central bank policy — all else equal — should push inflation higher. But current market dynamics will keep inflation mostly stuck. A modest trade war would pressure longer-term inflation dynamics less than many fear — again, given dynamics above — while a large trade war would actually lower inflation because of its damage to confidence and, ultimately, to demand.

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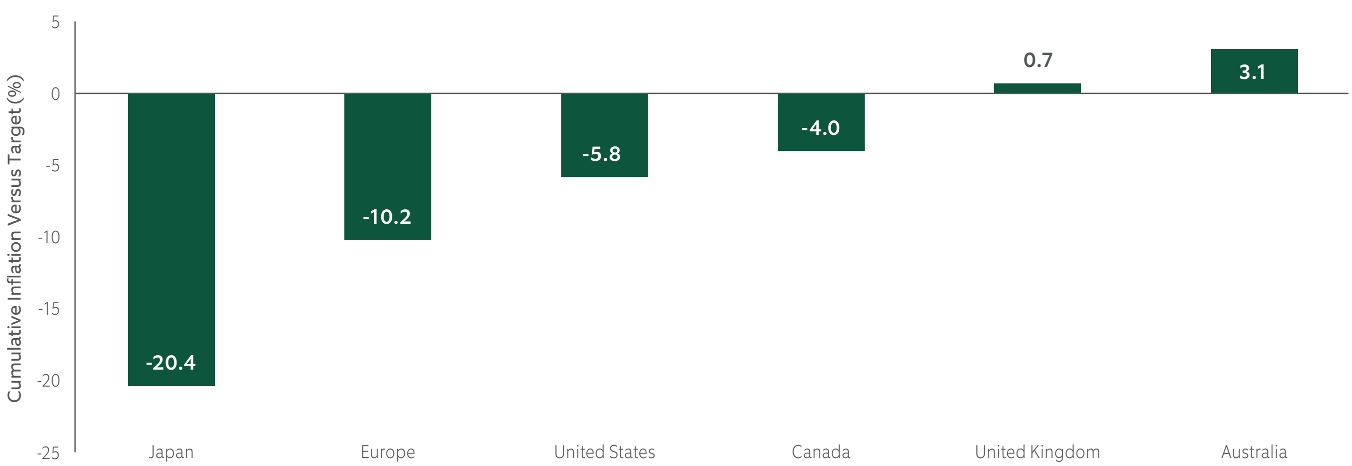
EXHIBIT 4: UNDERACHIEVERS

Cumulative inflation shortfalls over the past decade are biggest in the three major economies.



Source: Northern Trust Global Asset Allocation, Bloomberg. Green bars represent the core inflation measures. Data from 6/30/2008 to 6/30/2018.

PASS/FAIL MONETARISM

As noted in our 2017 theme of *Waiting for Monetary Godot,* we don't expect monetary policy normalization anytime soon. Instead, we believe central bankers have every incentive to remain cautious. Further, we believe that central banks are simply tasked with not failing — that is, inadvertently pushing the global economy into recession.

Central bankers are anxious to move off center stage after a decade of experimental monetary policy. As long as they don't fail, investors will instead focus on the re-emergence of executive leadership (see *Executive Power Drive,* page 14) as the bigger driver of risk taking and asset allocation decisions. To stay out of the spotlight, central banks will (as they should) pay less attention to any potential pockets of cyclical inflation and more attention to avoiding a premature end to this long-lived but lackluster economic expansion. Our continued expectation for *Stuckflation* (page 6) and the financial market stabilization provided by the stricter post-financial crisis regulations will help central banks in this endeavor and supports a cautious approach.

When applying this Pass/Fail scoring rubric specifically to the Federal Reserve, a passing grade means avoiding a rate hike trajectory that inadvertently (and unnecessarily) inverts the yield curve. Yield curve inversions have preceded all of the past five U.S. recessions (with no false-positives). In a world where such accurate indicators of future economic and financial market performance are difficult to come by, the Fed should take heed. Currently, the combination of recent rate hikes and stubborn longer-dated yields (the 10-year U.S. Treasury yield refusing to go materially above 3%) have the yield curve flirting with inversion. If structural inflationary pressures don't materialize — as we expect — further yield curve flattening will force the Fed to lower its rate hike trajectory.

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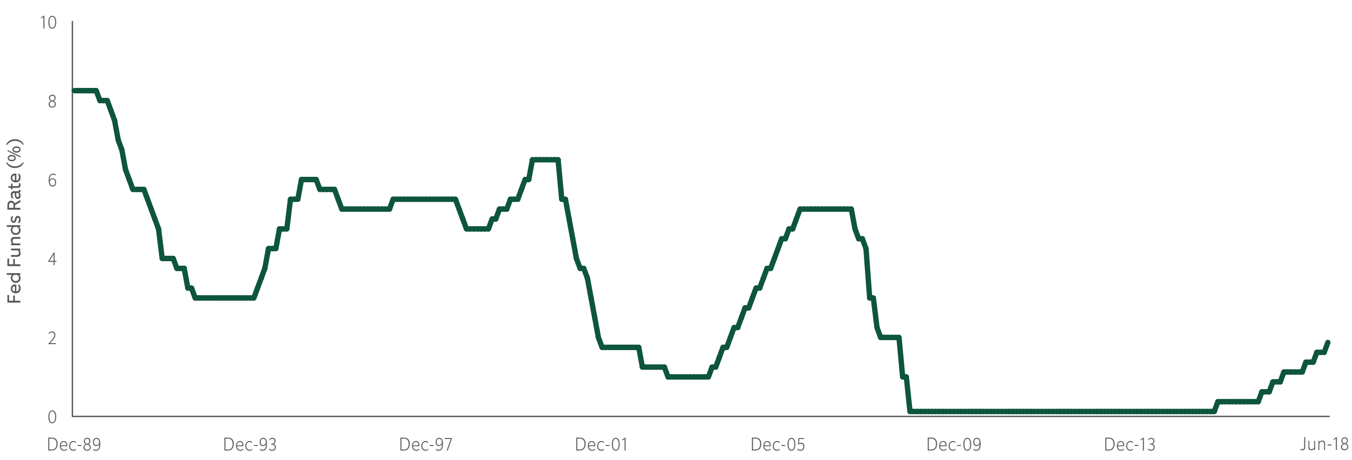
EXHIBIT 5: LOWER LOWS, LOWER HIGHS

Fed policy has moved closer to the zero-bound over the past 25-plus years.



Source: Northern Trust Global Asset Allocation, Bloomberg. Data from 12/31/1989 to 6/30/2018.

Many argue that the Fed needs to rebuild "dry powder" to confront the next economic downturn — and it does. As Exhibit 6 shows, the Fed has cut rates between 4% and 5% in the past three recessions. But it currently only has room for 2% of rate cuts before hitting the zero lower bound. However, building "dry powder" too fast just to be forced to put it to use more quickly is self-defeating. A better approach is to very gradually increase rates and reduce balance sheets to a new equilibrium level, relying on the structural forces keeping inflation low and stricter regulations preventing systemic risks.

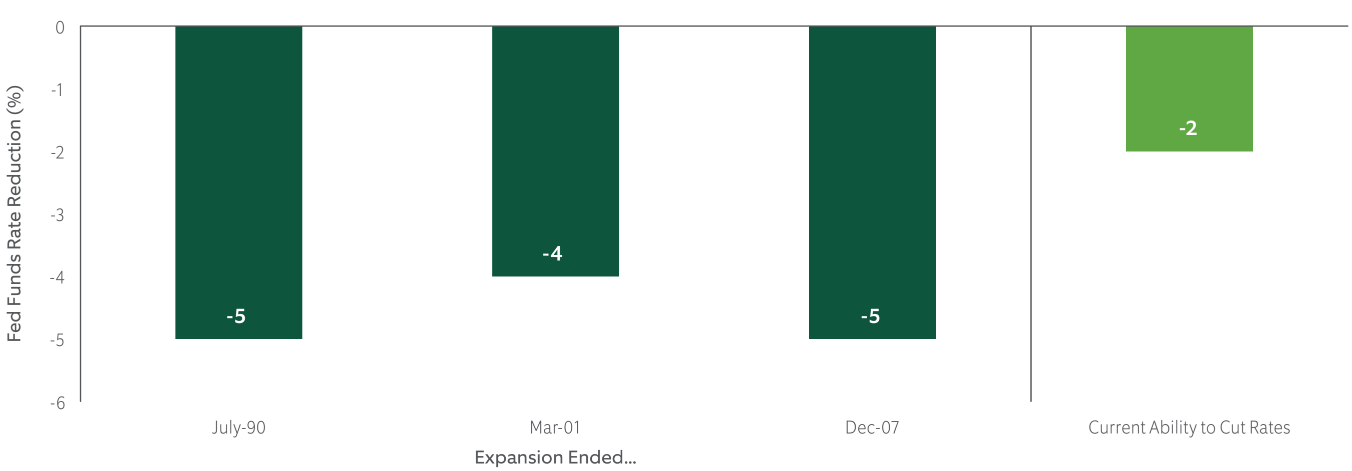
For the Fed, we believe this new equilibrium level is a policy upper bound of 2.5%. Meanwhile, we expect the European Central Bank (ECB) to (just barely) regain positive rate territory over the next five years while the Bank of Japan's interest rate policy will remain at zero. We provide further detail on the expected term structure (for these and other major economies) in the Fixed Income section (starting on page 16).

Our base case is for the Fed to reach this 2.5% equilibrium (neutral rate) in the first half of our five-year horizon, and to hold steady for the remainder of the period. From that point, it is more likely that the Fed will engage in another monetary easing cycle — to combat weakening global economic demand — than it is that it will be forced to push rates higher because of inflationary pressures. Other major central banks, which have greater structural demand challenges, will move even more cautiously.

We expect the Fed to reach a 2.5% policy rate and stay there. Other major central banks will move even more cautiously.

EXHIBIT 6: LESS ROOM FOR MANEUVERING

Current Fed policy is 2% from zero — just half of the normal Fed easing cycle.



Source: Northern Trust Global Asset Allocation, Bloomberg. Data from 12/31/1989 to 6/30/2018.

TECHNOLOGY SLOWZONE

In 2016, our theme of *Technological Turbulence* correctly anticipated that the path to technological adoption would be bumpy. However, it focused more on the political blowback related to displaced workers (due to job automation) and less on the disruptions to democratic systems that we have seen since then.

Data has become an economic and a political force. As such, it has found a new level of both scrutiny and appreciation from politicians around the world. The most public display of this came earlier this year, when Mark Zuckerberg was brought before lawmakers to explain how he intended to "fix" Facebook. Less public, but also having a large impact, was Europe's rollout of General Data Protection Regulation (GDPR) and Markets in Financial Instruments Directive (MiFID) II. The former regulates the use of personal data. The latter injects transparency into the financial markets — from full documentation of transaction prices to full separation of broker trading costs from research costs. Both are examples of how technology can spur innovation while, at the same time, creating new costs (and headaches).

It will take time to navigate this *Technology Slowzone,* as politicians feel their way to right-sized regulations in the new digital age. However, they eventually will reach solutions to allow technological advancement and data collection to continue. The benefits are too large to ignore.

One area where technological benefits already are being realized is the downward pressures on costs that technology-adept companies have brought to the marketplace. Amazon's acquisition of Whole Foods immediately resulted in cheaper prices across a wide variety of food products (Exhibit 7); and Amazon's foray into "basic" goods (batteries, etc.) is successfully reducing the "brand"

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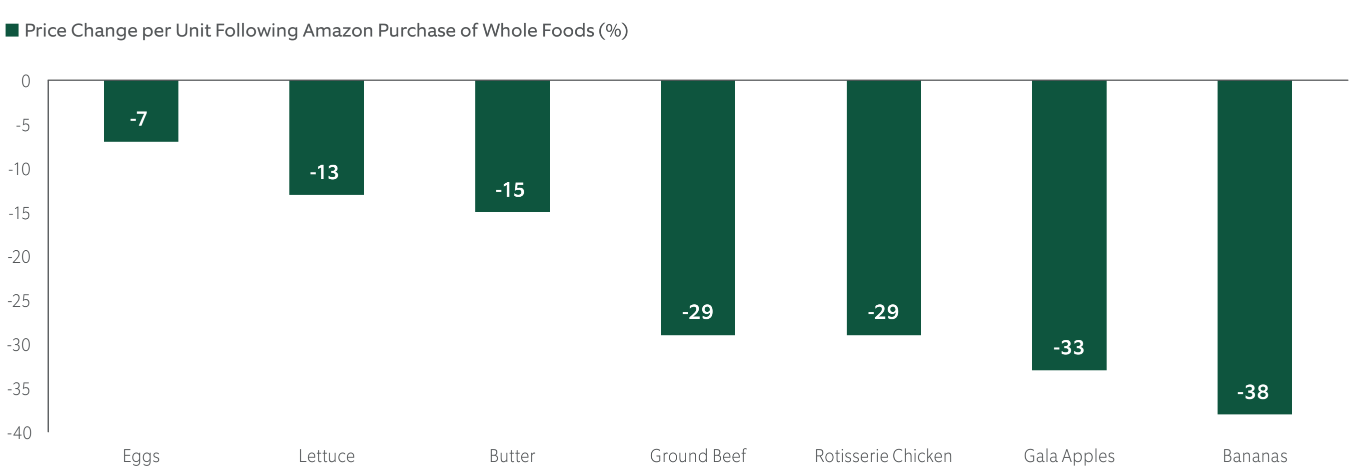
EXHIBIT 7: TECHNOLOGY BRINGS LOWER PRICES: FROM GROCERIES…

Amazon's purchase of Whole Foods came with immediate price cuts.



Source: Northern Trust Global Asset Allocation, Bloomberg. Price change shown represents change from 8/24/2017 to 8/28/2017.

premium. Elsewhere, Airbnb has introduced stiff competition in the traditional hoteling industry (Exhibit 8). These developments are not without problems: Amazon has been accused of monopolistic activities and Airbnb has often been blamed for apartment scarcity. Appropriate policy can solve these issues over time — as it does for any new technology (think automobiles).

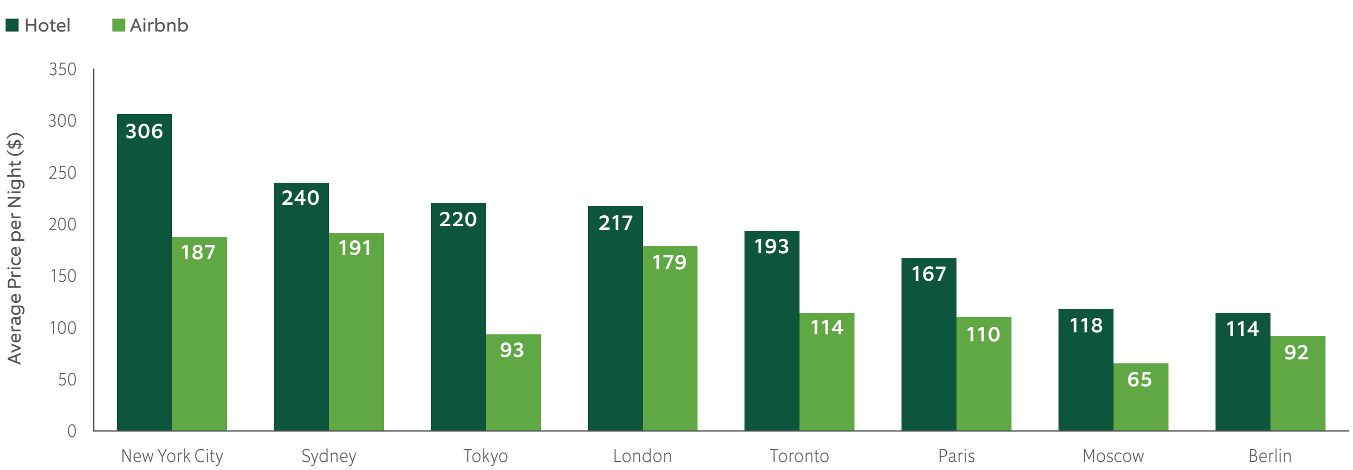
We already are realizing the benefits from many technological advances — mostly stemming from automation and price discovery enhancements. But the full benefits from data collection will carry a longer adoption timeline — the bigger the economic benefit, the more invasive it can be. For example, truly matching consumers with the products they want to buy requires extensive data on past purchasing habits. As such, regulatory policies on data collection will take longer to implement and companies will need to establish consumer trust.

Regulatory policies must cut two ways. First, they need to establish a level playing field. Companies like Amazon and Facebook have troves of data; smaller market players simply can't compete. One solution may be to mandate that all data is appropriately shared across the industry — but that will take time. Second, regulations need to establish an appropriate balance between allowing effective use of data and consumer privacy. Studies show that younger generations are much more amenable to having their data shared — though demographic shifts are slow. Investors should not be discouraged by what will likely be a slow adoption of technological potential. We're seeing many technological benefits already — the rest will come in due time.

Tech regulations must cut two ways. First, they need to establish a level playing field. Second, they need to establish an appropriate balance between effectiveness and privacy.

EXHIBIT 8: ...TO LODGING

Airbnb has proven itself a viable — and cheaper — alternative to traditional hotels.



Source: Northern Trust Global Asset Allocation, Kleiner Perkins 2018 Internet Trends. AirDNA, HRS, Statista. Prices as of January 2018.

GLOBAL (RE)POSITIONING SYSTEM

The rise in populism and the more recent isolationist rhetoric from U.S. President Donald Trump have many investors fearing the end of free markets and global multilateralism. This system has governed the world economy since the end of World War II, with the creation of the United Nations, the World Bank and the International Monetary Fund in 1945. It received a shot in the arm in 1995 with the creation of the World Trade Organization (WTO) and again in 2001 with China's admittance. As seen in Exhibit 9, the proliferation of global trade (as a percentage of GDP) responded in kind — growing from 24% in 1960 (earliest data available from the World Bank) to a high of 61% just ahead of the Great Recession in 2008. After a brief falloff, global trade has hovered just below the 60% mark. [Note: global trade figures count both exports and imports, so a fully trade-dependent global economy would register at 200%.]

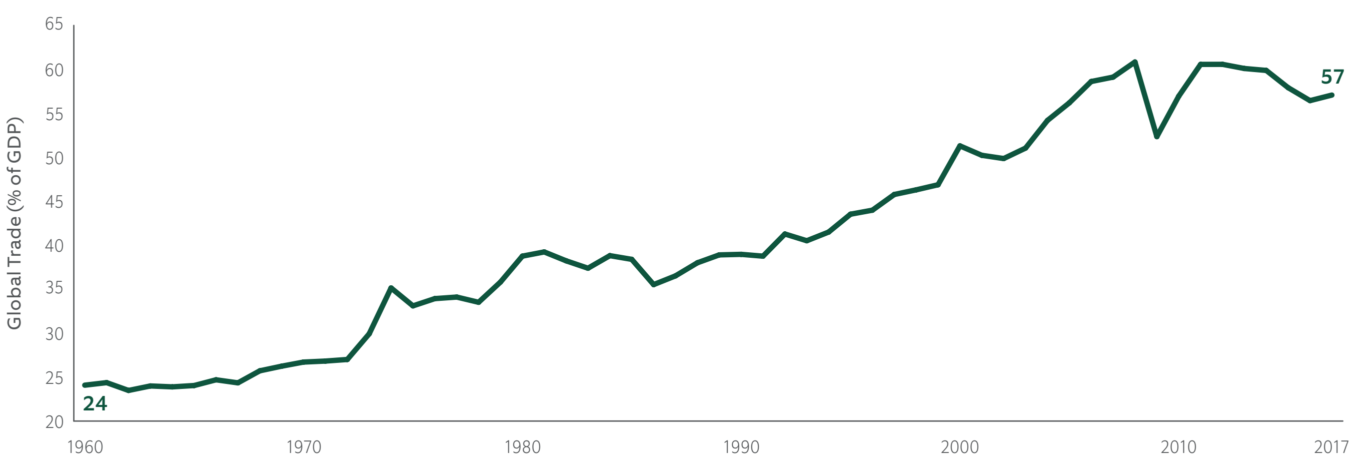
The fact that trade has become such an important element of the global economy is both a curse and a blessing in the current situation.

The fact that trade has become such an important element of the global economy is both a curse and a blessing in the current situation. It's a curse given the material impact a prolonged trade war could potentially have on global output; it's a blessing because that same material impact should keep it from actually happening (just as the biggest deterrent to nuclear war is the mutually assured destruction that would follow). Along with the rise in global trade over the past 50 years, corporations have also globally diversified their operations. As Exhibit 10 shows, nearly 30% of MSCI U.S. Index company revenues, in aggregate, come from outside the United States (the number is closer to 40% for S&P 500 companies). Companies in the MSCI Europe Index derive half of their aggregate revenues from outside of Europe. Meanwhile, supply chains have also become increasingly global — interconnected across economic and political blocs.

A reasonable argument can be made that protectionism today would not be as severe as the protectionism of the 1930s, when a large percentage of the

EXHIBIT 9: GLOBALLY INTEGRATED ECONOMIES

Over the past 25 years, global trade has risen dramatically.



Source: Northern Trust Global Asset Allocation, World Bank. Yearly data from 12/31/1960 to 12/31/2016. Northern Trust estimate as of 2017.

global population was employed in the agriculture and manufacturing sectors (those most hit by tariffs). Another reasonable argument can be made that some companies today, equipped with technological advancements (3D printing, etc.), are better able to adjust to any new trade deterrents by reorienting their supply chains. That said, it would be cavalier to not appreciate the negative impact a prolonged trade war would have on broader global growth and financial market sentiment. The bigger question is how determined world leaders would be to see a global trade war through. Populism suggests an extended battle is possible.

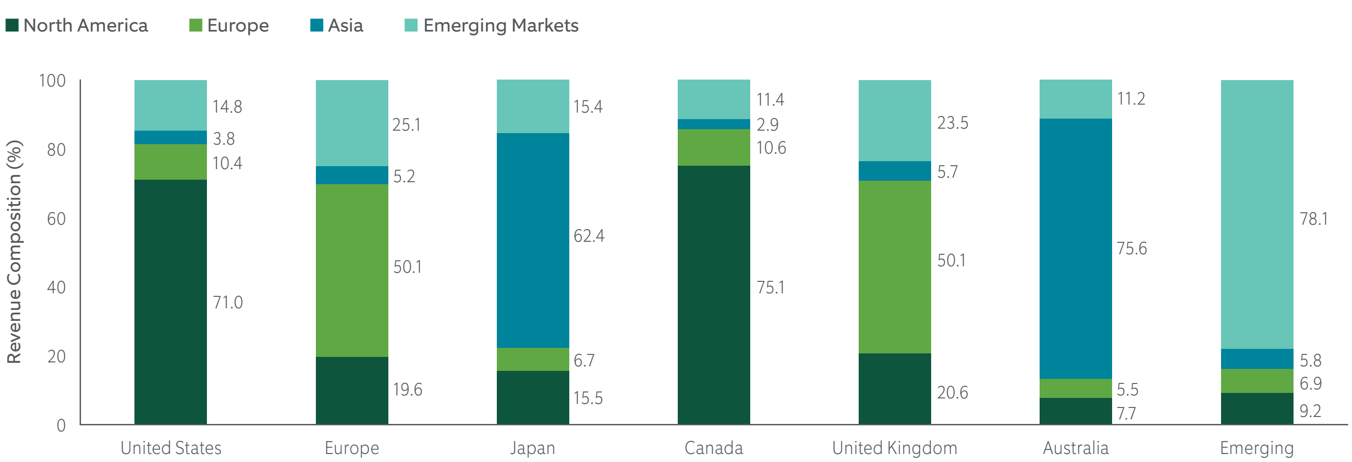
We expect a prolonged transition to a new — but still global — system. It will be a more bilateral approach, tweaking current trade frameworks in a more transactional way. All else equal, this "transition to transactionalism" will continue to induce volatility as investors confront change. But we believe the ultimate outcome will be more benign than investors fear — and may even present opportunities. A transactional approach sacrifices the comprehensive nature of global trade pacts but allows more flexibility and speed to market.

The current global system has been in place for more than 70 years now. The West's preferred free market approach is now competing for dominance with the managed capitalism endorsed by China. Throwing the current system out completely is wrong, but so too is thinking that it can remain in its current form while the global economy has changed so dramatically underneath it. Looking closely at both systems shows that some elements of managed capitalism are actually better suited for a digital economy (the proliferation of "winner take all" markets in the free market approach indicates the need for an adjustment). The new global system will be a blend of both free market and managed capitalism — a "repositioning," not a complete overhaul.

This "transition to transactionalism" will continue to induce volatility as investors confront change. But we believe the ultimate outcome will be more benign than investors fear.

EXHIBIT 10: GLOBALLY INTEGRATED COMPANIES

Corporations increasingly source revenues from all over the world.



Source: Northern Trust Global Asset Allocation, Factset. Data as of 4/30/2018.

EXECUTIVE POWER DRIVE

Investors' fears about the populist movement's implications for global equity markets have been calmed. The MSCI ACWI Index is up 28% (16% annually) since Donald Trump was elected president on November 8, 2016. More impressive, this strong global equity performance has been accompanied by much less market volatility than has been realized historically. Reasonable minds can disagree about the underlying drivers of the strong markets over the past two years (and often do — largely along party lines). But it is clear that "populism" as a broad construct doesn't have to be — nor has it been thus far — negative for financial markets.

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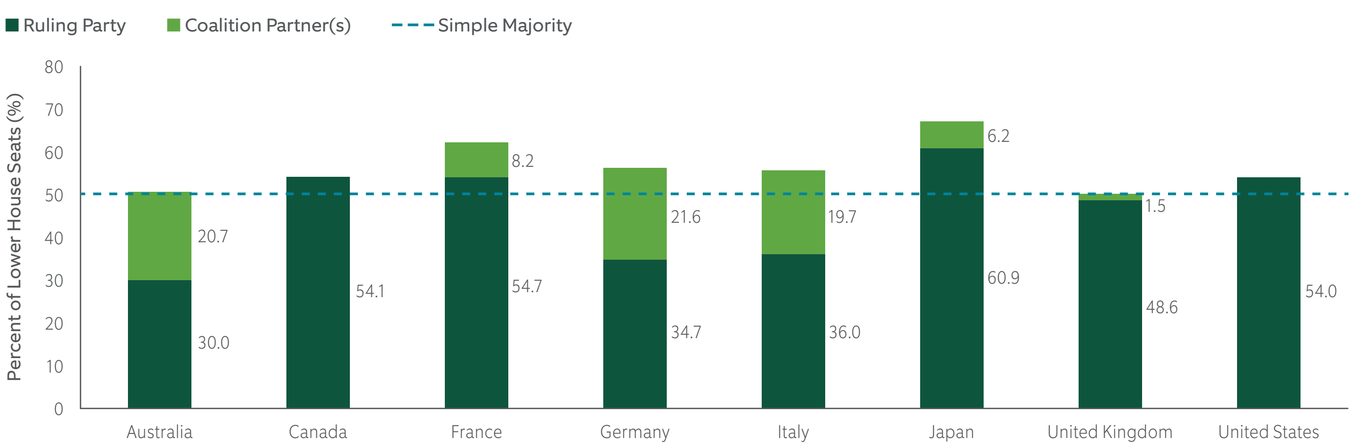
The populist movement has ushered in a new wave of elected officials — ones that have leveraged technology (social media) to tap into voter demands and deeply resonate with their constituencies. One key benefit of this new dynamic is voters' belief that they are being "heard." And, as we discussed in last year's *Populist Catharsis* theme, airing grievances and finding solutions are preferable to avoiding the issues altogether — no matter how ugly the process may be.

Meanwhile, as a result of China's rise, governments are now competing in a global environment increasingly populated by less-democratic political models. This has raised the profile and importance of executive leadership just as legislative power — and its effectiveness — has declined. Legislative bodies in many traditional democracies are dealing with constant shifts back and forth across the aisle — from narrow majority to narrow majority. Many parliamentary governments are increasingly fractured — while China's Communist Party enjoys a persistent 100% control. Exhibit 11 shows the size and composition (ruling party and coalition partners) of various legislative lower houses globally. Parliaments in Germany, Italy and the United Kingdom have all been forced to create coalitions of unlike-minded political parties. Populist parties have become sizable opposition parties or — in the case of Italy — the ruling party itself.

EXHIBIT 11: NARROW MARGINS

Legislative majorities are slim, with those who have parliamentary systems reliant on coalitions in many cases.



Source: Northern Trust Global Asset Allocation, various government websites. Chart shows the percentage of lower house seats held by the ruling party (and coalition partners if applicable).

Aggressive executive leaders with strong messages are needed to pull the legislative branches back together. French President Emmanuel Macron was an example of a strong — and populist — executive leader (French equity markets rallied 4% the day after it was clear he would be France's next head of state). But his profile has faded somewhat since. The message to executive leaders: double-down; more aggressively rally your base; talk directly to your constituents via social media.

This new approach to governing seems that it would be counter-productive at best and catastrophic at worst. But, thus far, investors have been open minded about the more aggressive approach as long as it supports economic growth. Investors are focusing more on what political leaders do than what they tweet. What they tweet is simply a means to an end — a way to galvanize the base. What they actually do is what will dictate the path of financial markets.

Executive leaders are "hearing" their constituents, providing comfort that they are "on their side," but ultimately they will enact policy that abides by what financial markets will allow. Trump only took on his trade initiatives when the U.S. economy was on solid footing. Greek Prime Minister Alexis Tsipras put the Greek bailout package to referendum, but ultimately agreed to terms with the European Union. As with any negotiation, starting from a strong position and compromising toward the "middle" can ultimately lead to a more favorable outcome.

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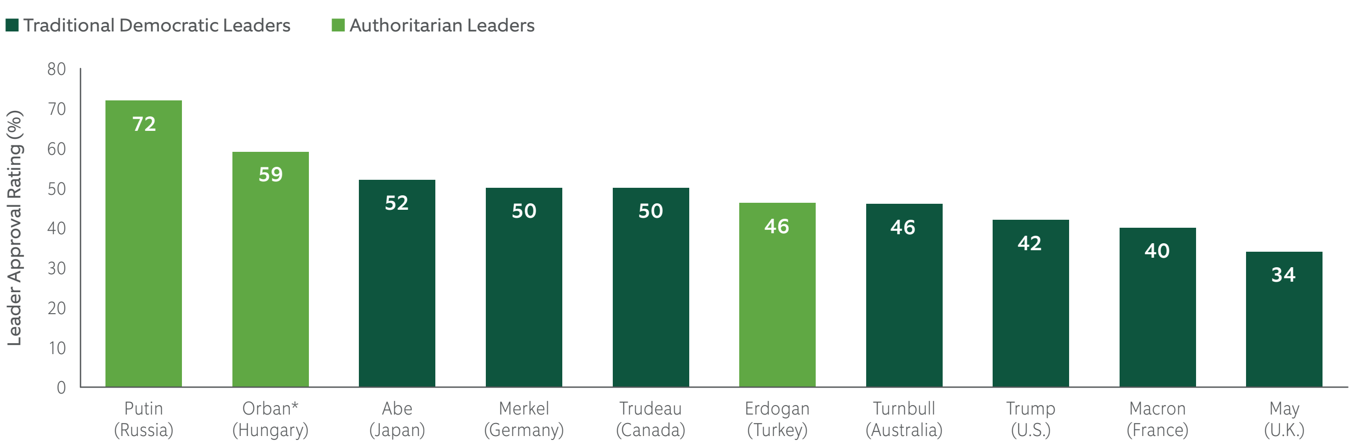
EXHIBIT 12: HARD TO PLEASE

Amid low approval ratings for politicians globally, populist leaders have found their niche.



Source: Northern Trust Global Asset Allocation, fivethirtyeight.com, Opinium, ARD-DeutschlandTrend, Ifop, Nikkei, Ipsos, Median, MetroPoll (May 2018), VTsIOM, The Australian (May 2018). Poll data as of June 2018 unless noted otherwise. *Denotes approval of leader's political party.

FIXED INCOME

Forecasting fixed income returns is an exercise in understanding the effects of two primary variables:

1. **Term structure:** The expected progression of interest rates on "risk-free" bonds as maturity (term) increases, driven by the compensation investors require over various periods (term risk).
2. **Credit spreads:** The extra yield (spread) required by investors to assume the risk they could lose their original investment due to issuer insolvency (credit risk).

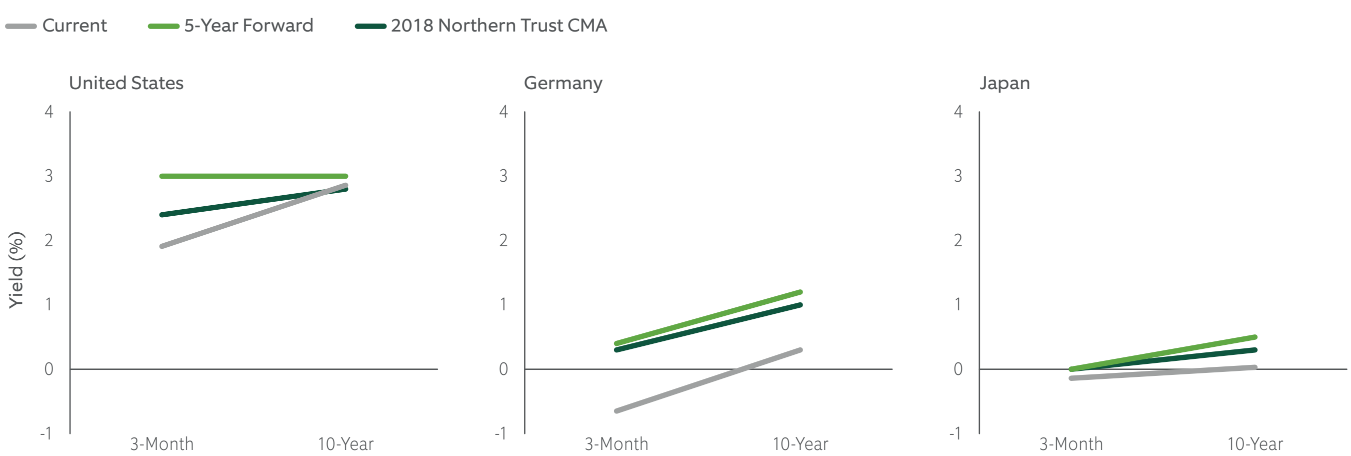
Term structure is heavily dependent on the outlooks for monetary policy and the economy. In simple terms, central banks are seen as controlling the short-end of the yield curve while growth and inflation expectations dictate longer-dated rates. However, because growth and inflation influence central bank decisions on short-term rates, investors are also essentially predicting the longer-term path of short-term rates. To give a simple example, if the Fed is expected to maintain rates at 2% for five years and then increase rates to 3% for the next five years, the 10-year U.S. Treasury would likely carry a yield somewhere in the 2.5% range (possibly a bit higher to account for uncertainty — but not too much higher or arbitrage opportunities would arise). As such, economic fundamentals, as well as the outlook for monetary policy, help us understand the expected yield on longer-dated debt.

Our *Mild Growth Myopia, Stuckflation* and *Pass/Fail Monetarism* themes set the stage for short-term rates to move only modestly higher over our five-year horizon. We expect the U.S. Treasury yield curve to flatten as the Fed slowly increases its policy rate to a new, lower-than-historical neutral level (2.5% upper bound) in the first half of our five-year forecast period, and then to hold steady for the remainder of the period. This will put downward pressure on 10-year yields (we forecast a 2.75% level). Other yield curves globally should experience more of an upward shift (as opposed to a flattening) because of their expected slower path to achieving policy rate neutrality. We believe this upward shift in global rates will be generally less than is anticipated by forward market rate markets.

Our *Mild Growth Myopia, Stuckflation* and *Pass/Fail Monetarism* themes set the stage for short-term interest rates to move only modestly higher over our five-year horizon.

EXHIBIT 13: LOW RATES, FLAT CURVES

Mild growth and stuckflation will keep interest rates low and yield curves flat globally.



Source: Northern Trust Global Asset Allocation, Bloomberg. Current and five-year forward data as of 6/30/2018.

Our five-year-forward interest rate forecasts (vs. market expectations) for the sovereign debt of major developed economies are listed below and displayed in Exhibits 13 and 14.

	3-Month		10-Year	
Country	Northern Trust	Market	Northern Trust	Market
United States	2.4%	3.0%	2.8%	3.0%
Europe (Germany)	0.3%	0.4%	1.0%	1.2%
Japan	0.0%	0.0%	0.3%	0.5%
United Kingdom	1.3%	1.4%	1.8%	2.0%
Canada	1.8%	2.3%	2.3%	2.3%
Australia	2.8%	2.9%	3.3%	3.1%

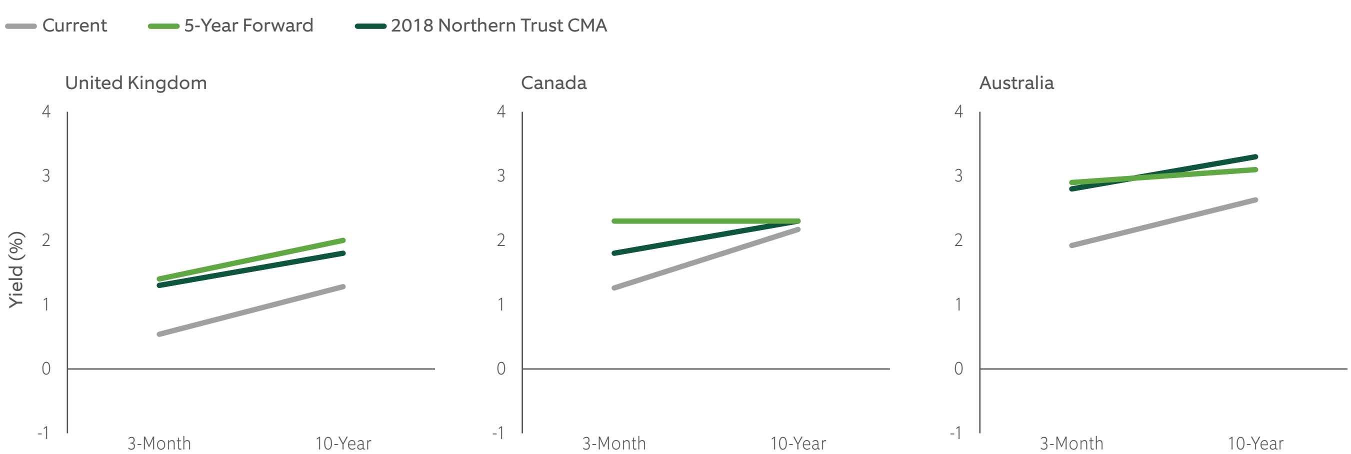
The United States will continue to have higher rates across the curve than most developed markets. The one exception is Australia, where higher inflation and starting policy rates are expected to keep its yield curve elevated vis-à-vis other developed markets, except those economies dealing with fundamental credit concerns (i.e., Italy). Japan's yield curve will remain very flat, stuck close to 0%, as experimental monetary policy continues. Yield curves in other major economies — including Europe (proxied by Germany), the United Kingdom and Canada — are expected to maintain slightly positive slopes. Sovereign yields in all developed economies (even Japan) are expected to move out of negative territory, but will remain at very low levels versus history.

Our general expectation for short-term interest rates to slowly move higher means average annual cash returns will range from 2.5% in Australia to -0.3% in Europe as the ECB digs out from its negative rate hole. The United States is expected to have a cash return of 2.2%, while cash in Japan, the United Kingdom and Canada is expected to return 0.0%, 0.9% and 1.6% respectively.

Our general expectation for short-term interest rates to slowly move higher means average annual cash returns will range from 2.5% in Australia to -0.3% in Europe.

EXHIBIT 14: LOW RATES, FLAT CURVES

Mild growth and stuckflation will keep interest rates low and yield curves flat globally.



Source: Northern Trust Global Asset Allocation, Bloomberg. Current and five-year forward data as of 6/30/2018.

Longer-Duration Index Returns

Forecasting the returns for longer-duration fixed income indexes becomes more involved because it incorporates market expectations and fixed income index dynamics, which can result in differences between starting point yields and actual five-year returns (although the two are highly correlated). For global Treasuries and global investment-grade fixed income, this annualized difference has averaged 1.1% and 0.6%, respectively, during the past 30 years (see Exhibit 15).

This "outperformance" was made possible by the combination of interest rates persistently undershooting market expectations (positively sloping yield curves helped) and the index's evergreen structure (new bonds are continually being added to the index as old bonds mature). The former provided price appreciation while the latter allowed that price appreciation to persist through time. This "outperformance" has been fairly constant throughout history.

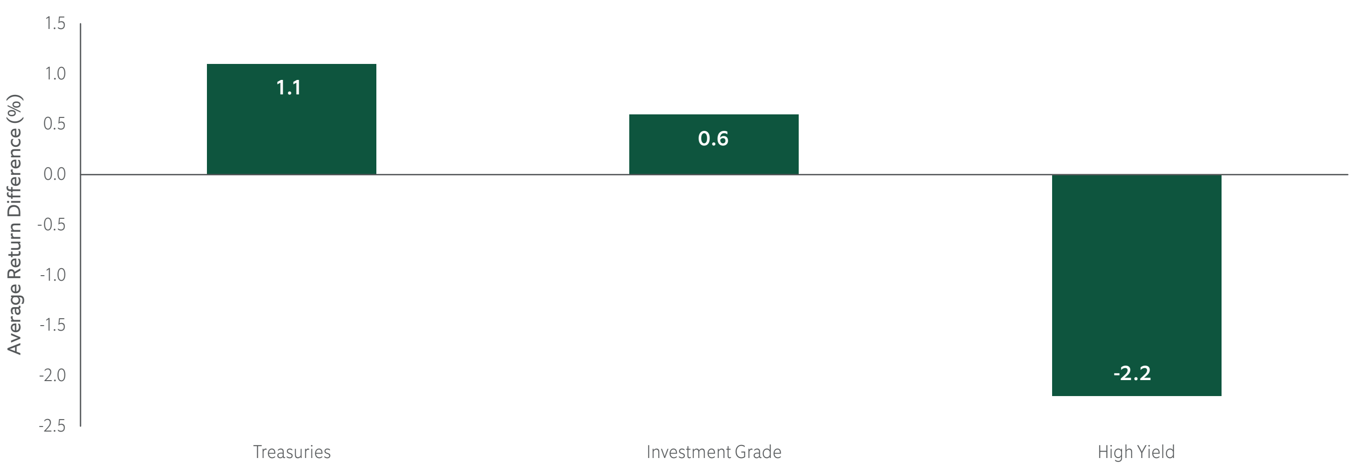
One exception was in the late 1970s, when interest rates moved materially higher over the subsequent five-year period. However, it is not enough for interest rates to just ratchet higher; to experience "underperformance," they must exceed what is priced into the forward curves (future interest rate expectations). For example, over the past five years, the yield on the U.S. Treasury index has doubled — from 1.2% to 2.7% — yet the index still outperformed the starting point yield by 0.3% annually. Meanwhile, the global investment grade index has fallen slightly to 2.0% from 2.1% over the past five years, with an annualized return of 3.3%.

Because we expect interest rates to remain below what is priced into forward curves, we forecast that the 2.0% starting point yield will translate into a 2.7% annualized total return. A similar dynamic is in play for our regional fixed income forecasts (see Exhibit 16). To summarize, constrained increases in yields will support fixed income prices allowing total returns to outpace starting point yields.

Constrained increases in yields will support fixed income prices allowing total returns to outpace starting point yields.

EXHIBIT 15: HOW A YIELD BECOMES A RETURN

Five-year annualized returns differ from starting point yields due to term structure and credit impacts.



Source: Northern Trust Global Asset Allocation, Bloomberg. Average return difference measured from 12/31/1986 to 3/31/2013.

High Yield Outlook

Credit impacts on total return are most noticeable within high yield. Referring back to Exhibit 15, global high yield's credit element (in the form of defaults) leads to five-year annualized returns below starting point yields — a 2.2% hit on average. Today we believe default pressures will be slightly below the historical experience. The fairly stable economic outlook will support revenues while *Stuckflation* and the resulting monetary accommodation will keep financing conditions constructive. That said, defaults are inevitable, especially this late in the credit cycle. As such, and consistent with history, we expect a lower total return than the current yield on the global high yield index. Our 4.6% global high yield forecast is 1.9% below the index's 6.5% yield.

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Emerging Market Debt

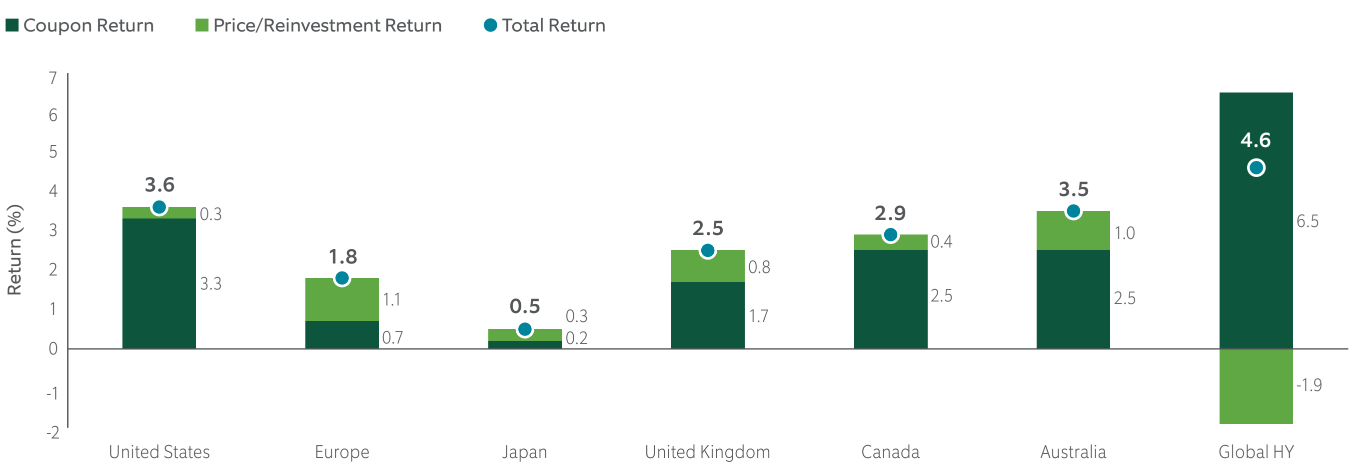
Emerging market debt will benefit from stabilizing economies (i.e., no hard landing in China). With its higher starting point yield, emerging market debt is an attractive complement to global high yield in a well-diversified portfolio. The path of the dollar significantly influences the performance of emerging market debt. We don't have a strong view on the dollar's direction over the next five years, but continued strength would weigh on emerging market debt returns.

U.S. Municipals

We expect overall credit stability for the majority of the market during the next five years, although rising pension obligations will continue to put pressure on pockets of the market. The Trump tax reforms will add some level of challenge for states with comparatively high tax rates, particularly those already dealing with outmigration and lagging business growth. But high-tax states also will likely benefit from rising investor demand for their tax-free securities. Meanwhile, overall supply will be constrained as state and local issuers await clarity on potential federal infrastructure programs and hope for revenue growth to support additional debt loads.

EXHIBIT 16: FIXED INCOME BUILDING BLOCKS

Fixed income returns continue to suffer from low yield starting points.



Source: Northern Trust Global Asset Allocation, Bloomberg. Coupon return calculated as yield to worst on 6/30/2018. Price return of global high yield is -0.4%.

EQUITIES

Our equity forecasting process is informed by quantitative analysis, understanding what economic and financial market factors have driven equity returns over time. Of all the factors we follow, valuations — specifically cash flow yields — have proven to be the best predictor of future returns. Analyzing developed market equity data going back to 1970, cash flow yields have explained 42% of next-five-year total return variability and 85% of next-10-year total return variability. Given current above-average valuations (8.5% cash flow yield vs. the 12.5% long-term average), the model predicts a five-year annualized total return of 3.3% (see Exhibit 17) — well below the long-term historical average of 8.3% (data back to 1900).

Analyzing developed market equity data going back to 1970, cash flow yields have explained 42% of next-five-year total return variability and 85% of next-10-year total return variability.

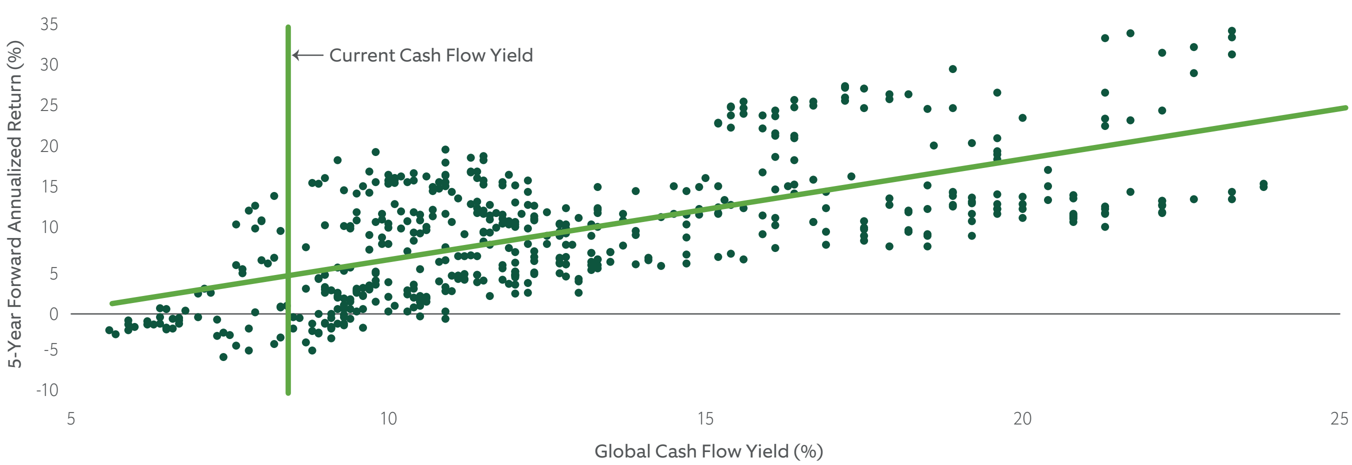
Not only does the quantitative analysis suggest a lower return, it also assigns a lower probability of a positive return over the next five years. Exhibit 18 divides the monthly historical cash flow yields into deciles and shows the average return and probability of a positive return in each of those decile buckets. While positive five-year returns have been historically guaranteed when valuations are in the lower six deciles, the probability of a positive return dips below 100% starting in the seventh decile and falls below 50% in the tenth decile (where valuations currently sit).

Our quantitative analysis of emerging market equities is limited by a shorter data set (the MSCI Emerging Markets Index starts in 1987). For the 30-plus years of data we do have, emerging market equities have shown a 0.89 correlation to developed market equities with a 1.20 beta and a 3.1% annualized return premium.

However, this return premium has not been constant. For instance, emerging markets have underperformed developed markets by 5.4% annually over the

EXHIBIT 17: VALUATION HEADWINDS…

High valuations (low cash flow yields) have historically been met with lower returns.



Source: Northern Trust Global Asset Allocation, Bloomberg. MSCI World cash flow yields are the inverse of price to cash earnings ratio.

past five years. More attractive valuations (10.8% cash flow yield) and a stable emerging economic growth environment (no China hard landing) should allow the return premium to resume during the next five years. The size of that return premium will depend on the degree to which emerging market growth — particularly in China — slows from its rapid pace of the past couple decades.

To determine our equity forecasts — both for global and regional markets — we apply our forward-looking views through a building-block approach.

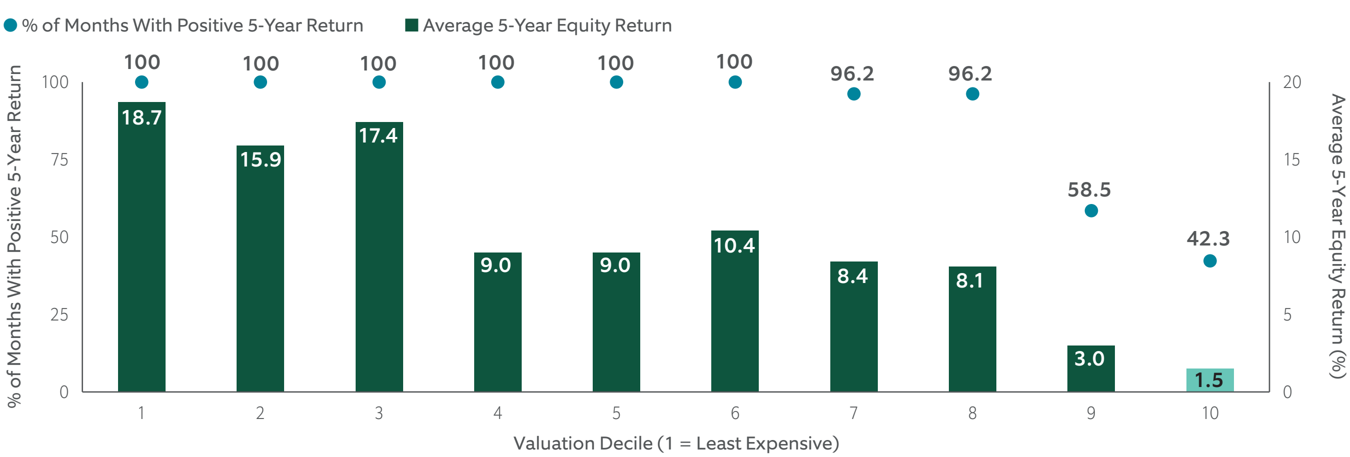
The Building Blocks of Our Forecasts

Our historically based quantitative analysis is a check on our forward-looking views. We apply these forward-looking views to both global and regional equity markets through a building-block approach, involving four primary forecasts:

1. **Revenue growth:** Expected revenue growth for each equity index is based on our nominal economic growth forecasts multiplied by the index's geographic composition.
2. **Profit translation:** Profit translation — companies' ability to turn revenue into per-share earnings — includes changes in both profit margins and share counts (share repurchases/share issuance).
3. **Valuations:** While we use cash flow yields in our quantitative process, we use expected change in price-to-earnings ratio to forecast valuation impact. This allows us to maintain consistency with our earnings forecast.
4. **Dividend yield:** We use current dividend yields as our starting-point forecast, only deviating if we have a specific expectation based on our forward-looking views that companies will return more or less cash to shareholders via dividend payments.

EXHIBIT 18: …HAVE HISTORICALLY REDUCED ODDS OF SUCCESS

Valuations in the 9th and 10th decile have lower probabilities of positive five-year returns.



Source: Northern Trust Global Asset Allocation, MSCI World CF yields and five-year returns from 1/31/1970 to 6/30/2013. Current 6/30/2018 CF yield (8.3) is in the 10th decile and indicated in light teal.

The table below outlines our building block expectations for developed markets, emerging markets and global equity markets as a whole.

Building Block	Developed Markets	Emerging Markets	All Countries
Revenue Growth (%)	4.2	6.9	4.5
Profit Translation (%Δ)	0.2	-2.2	0.0
Valuations (%Δ)	-0.9	1.1	-0.7
Dividend Yield (%)	2.4	2.4	2.4
Total Return (%)	6.0	8.3	6.2

Developed market equities = MSCI World; emerging market equities = MSCI EM; all country world equities = MSCI ACWI. Components may not exactly equal total return due to compounding.

The modest growth outlook articulated in our *Mild Growth Myopia* theme results in mid-to-lower single digit revenue growth across developed markets and high-single digit revenue growth in emerging markets. Meanwhile, our structural expectation for *Stuckflation* should allow developed market profit margins to remain elevated. When combined with the expectation for continued share repurchases, developed markets should experience positive profit translation. However, emerging markets — as notorious share issuers — will suffer in this "building block."

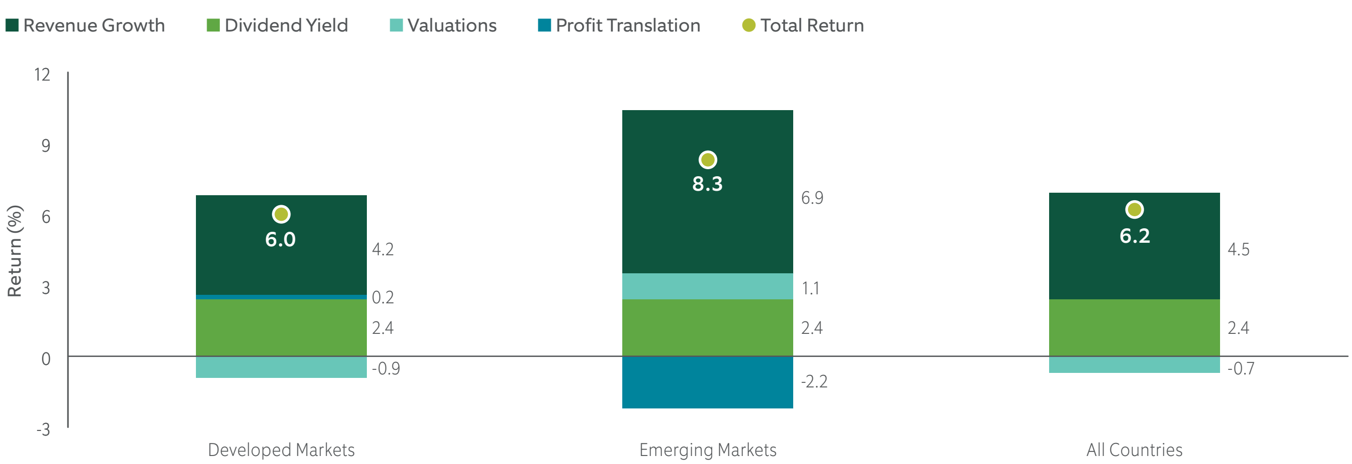
Our quantitative starting point suggests a developed market return of only 3.3% (see page 20), but that assumes valuations revert to the long-term average. We believe valuations will remain elevated; we have projected only slight valuation contraction in developed markets and valuation expansion in emerging markets.

Returns in individual economic regions are more idiosyncratic and, therefore, harder to forecast — but we make an attempt in Exhibit 20 (further detail is available on request).

We believe valuations will remain elevated; we have projected only slight valuation contraction in developed markets and valuation expansion in emerging markets.

EXHIBIT 19: EQUITY BUILDING BLOCKS: HIGH LEVEL

Positive returns will continue in developed markets; emerging markets benefit from attractive valuations.



Source: Northern Trust Global Asset Allocation.

Looking at Factors

Segmenting global equity markets by geography can be complemented by a factor-based approach — dissecting the equity universe into collections of stocks with common characteristics that provide persistent return premiums. Broadly recognized factors include: size (small capitalization stocks); value (inexpensive stocks); momentum (stocks recently outperforming the market); as well as low volatility and dividend yield. Another well-known factor — quality — has varying definitions. We focus on three aspects of quality: profitability, cash generation and management efficiency (efficient use of capital). Using this definition, we find that high-quality stocks have less risk — and less tail risk — than low-quality stocks and, over time, high-quality stocks have outperformed low-quality stocks across most markets.

Forecasting equity factor returns is beyond the scope of our annual effort, given varying portfolio implementation procedures (e.g., the degree of "tilt" toward individual factors, the potential combination of factors, etc.). However, we've summarized potential long-term return implications for factor returns based on research from our quantitative research team:

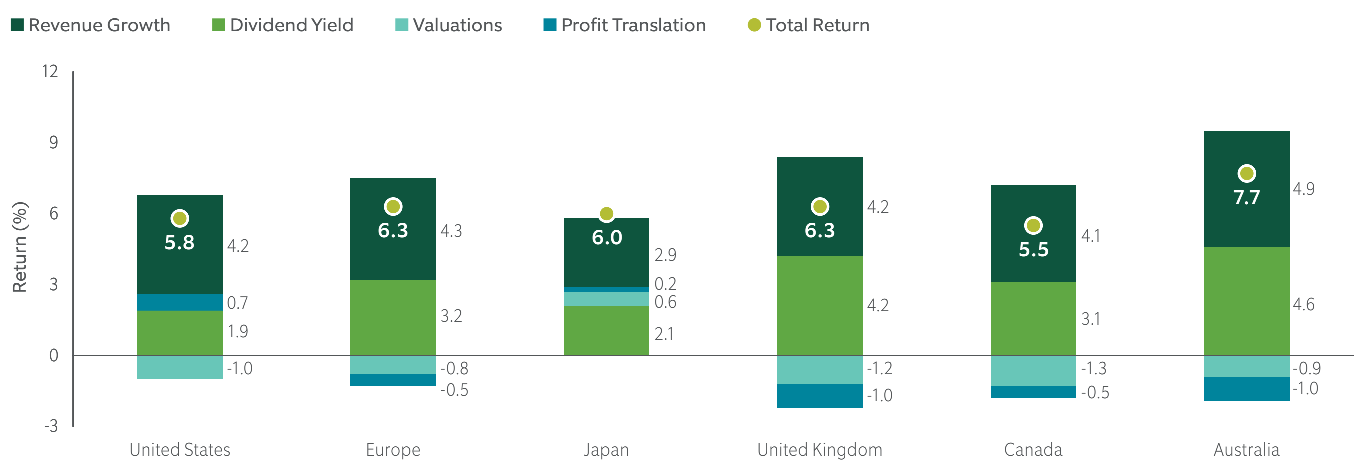
When analyzing relative factor valuations on a price-to-book basis (relative to history), value continues to stand out as attractively priced. Low volatility, richly valued at the time of last year's Capital Market Assumption process, has now moved back to its long-run average value across most major markets.

The factors we focus on tend to perform well in contractionary stages of the economic cycle, while value and low volatility have performed best during periods with Fed rate hikes. The flattening of the current economic cycle (*Mild Growth Myopia*) and the expectation for continued accommodative monetary policy (*Pass/Fail Monetarism*) may affect this historical pattern.

We find that high-quality stocks have less risk than low-quality stocks and, over time, high-quality stocks have outperformed low-quality stocks across most markets.

EXHIBIT 20: EQUITY BUILDING BLOCKS: REGIONAL DETAILS

We expect a small valuation contraction across most developed markets.



Source: Northern Trust Global Asset Allocation.

REAL ASSETS

The industry term "real assets" is a bit clumsily defined. Our primary asset classes in this category — natural resources, global real estate and listed infrastructure — aren't technically real assets (like physical gold). Instead, they are equity based. But they do provide real benefits to the portfolio, including diversified risk exposures and, in some cases, inflation protection (see Exhibit 21).

We start our real asset forecast process with a review of historical quantitative relationships, identifying risk exposures. Our primary "real asset" asset classes all have equity market exposure. In addition, natural resources has emerging market equity and commodity exposure; real estate and listed infrastructure have term (interest rate) exposure, and real estate has credit exposure.

Multiplying asset class exposures to these factors by our return expectations for these factors provides a baseline. We then conduct a qualitative review based on forward-looking themes (captured in the adjustment). Forecasts are listed below, along with the contribution from each relevant factor and the qualitative adjustment (if any). For instance, the 6.0% global real estate forecast comprises contributions from global equity (market), interest rate (term) and credit risk exposures of 2.9%, 0.3% and 1.1%, respectively — along with the 2.2% cash return and an adjustment of -0.5%.

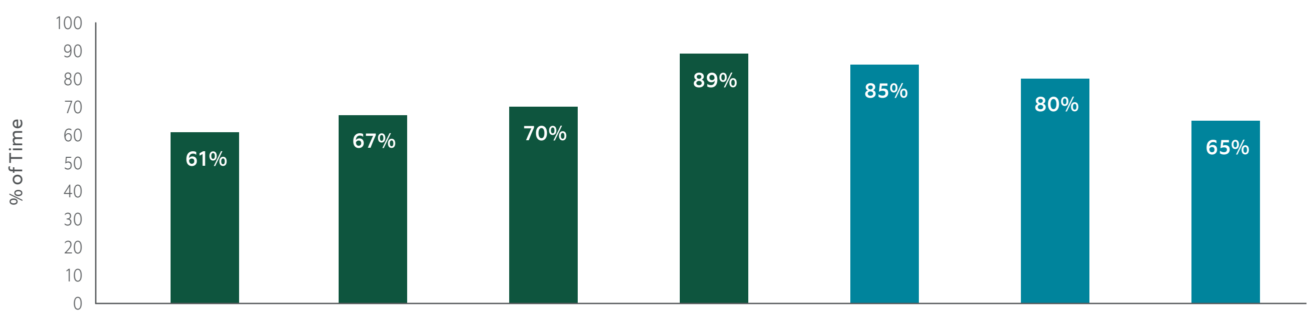
Contribution (%)	Natural Resources	Real Estate	Listed Infrastructure
Cash Return	2.2	2.2	2.2
Market	3.7	2.9	3.0
Term	—	0.3	0.2
Credit	—	1.1	—
Emerging Market	1.0	—	—
Commodity	0.3	—	—
Adjustment	0.0	-0.5	0.0
Total Return (%)	7.2	6.0	5.4

Components may not exactly equal total return due to compounding.

Real assets provide real benefits to the portfolio, including diversified risk exposures and, in some cases, inflation protection.

EXHIBIT 21: REAL RETURNS

Natural resources and listed infrastructure do a better job of covering inflation during periods of high inflation.



During:	Fixed Income	Global Equities	TIPS	Futures-based Commodities	Natural Resources	Global Listed Infrastructure	Global Real Estate
"High" Inflation	4.2%	7.6%	7.3%	16.3%	23.6%	15.3%	9.6%
Normal Inflation	4.5%	8.9%	4.1%	-4.5%	4.2%	9.5%	10.9%

Source: Northern Trust Global Asset Allocation, Bloomberg. Data from 12/31/2001 to 3/31/2018. High inflation (above 2.98%) is the 75th percentile of data during the data range. Normal inflation is below 2.98%.

Natural Resources

We believe an equity-based approach to natural resources is a better way to gain commodity exposure. Historically speaking, it has materially and persistently outperformed a futures-based approach (see Exhibit 22). Driving this outperformance is its equity market exposure, but commodity prices still play a large part in the return expectation. The modest growth environment — combined with OPEC-controlled supply — has steadily removed the oil glut of the past few years. Meanwhile, the continued rise of the emerging market middle class should support commodity demand more broadly. We made no adjustments to our quantitatively derived return forecast of 7.2%.

Historically speaking, an equity-based approach to natural resources has materially and persistently outperformed a futures-based approach.

Global Real Estate

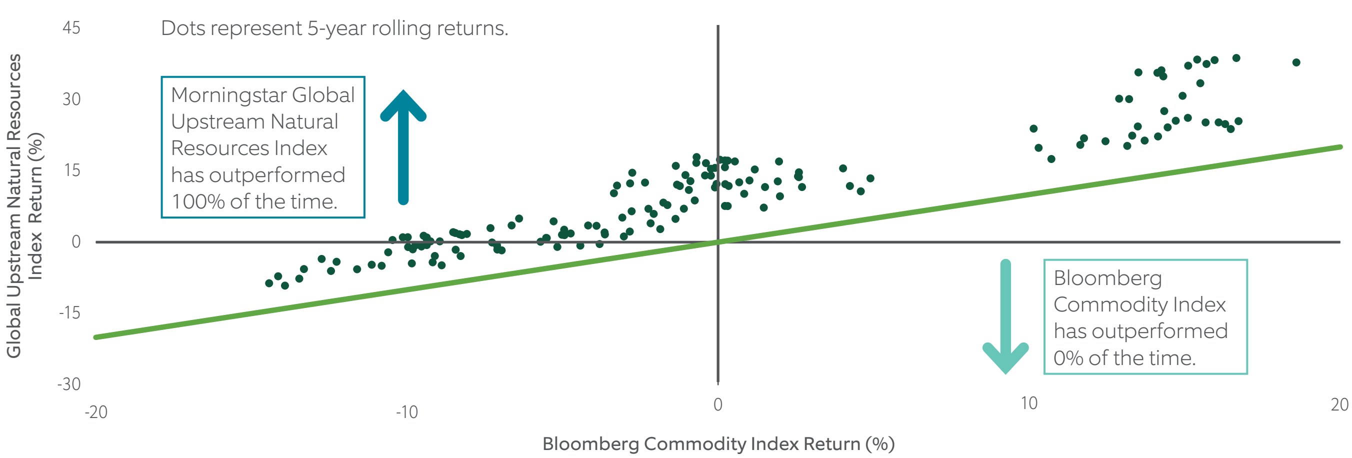
Term and credit risk exposures provide continued support for global real estate, especially after the recent uptick in interest rates (that we don't expect to persist). Fundamentals are mixed: traditional supply is growing slower than in past cycles, but demand pressures likely will continue as shoppers move online and office space is rationalized. These are issues we have flagged for some time, but they remain a drag on demand — as well as investor sentiment. As such, we continue to qualitatively adjust downward (by -0.5%) our quantitatively driven return forecast — leading to our 6.0% return expectation.

Global Listed Infrastructure

Term exposure will provide support to global listed infrastructure and investors may view the asset class as a purer bond proxy than global real estate, without some of global real estate's fundamental challenges. Developed economy infrastructure needs provide longer-term opportunities as cash-strapped governments look to the private sector for help. We made no adjustments to the quantitative baseline, expecting a 5.4% total return.

EXHIBIT 22: A STRUCTURALLY BETTER SOLUTION

Equity-based natural resources outperform futures-based commodities in both up and down markets.



Source: Northern Trust Global Asset allocation, Bloomberg. Data from 12/31/2000 to 6/30/2018.

ALTERNATIVES

We define alternative investments as asset classes that enhance risk-adjusted portfolio returns by introducing nontraditional risks. We focus on two primary asset classes — private equity investments and hedge funds.

When we apply a 2.0% return premium to our 6.0% global equity return forecast, we come to an 8.0% return forecast for private equity.

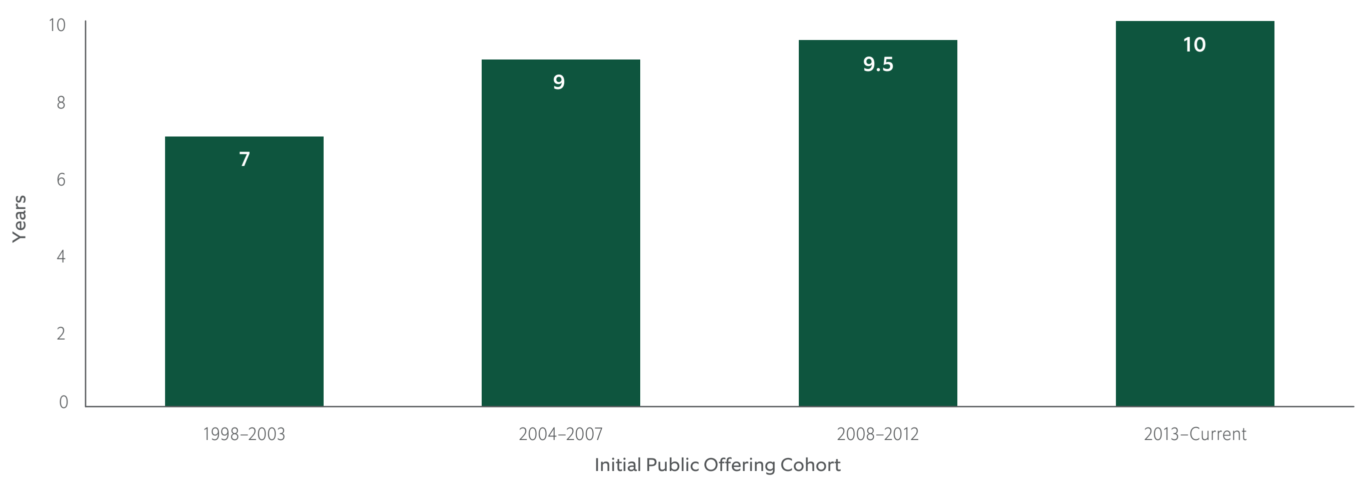
Private Equity

Forecasting private equity returns is difficult because the absence of public pricing inhibits quantitative analysis. But it is intuitive to expect equity-like returns with a return premium to compensate for asset class illiquidity. Academic research, using public market equivalent returns (converting private equity internal rates of return into traditional return streams) supports this intuition, suggesting a historical return premium of 2.5% (this figure also includes alpha generation in addition to the illiquidity premium).

In our 2016 CMA effort, we haircut this historically realized return premium by 0.5% (to 2.0%) to capture concerns over higher valuations and heightened investor interest (making "deals" more difficult to find). Since then, private equity interest has grown and valuations have increased slightly. However, these concerns have been somewhat alleviated by the greater number of opportunities in the private equity space — particularly venture capital. As companies remain private longer (see Exhibit 23), the opportunity set grows — and the higher prices venture capital firms are paying are partially justified by the higher valuations these private companies expect to realize at that (later) initial public offering (IPO) date. The net effect is that more returns accrue to private — vs. public — equity holders, thus increasing the interest in private investing. With a greater opportunity set offsetting slightly higher valuations and increased investor interest, we maintained our 2.0% premium. Applied to our 6.0% global equity return forecast, we come to an 8.0% return forecast for private equity.

EXHIBIT 23: MORE INFLOWS FOR MORE OPPORTUNITIES

Companies are staying private longer, increasing the number of private equity opportunities.



Source: Northern Trust Global Asset Allocation, *Venture Capital Journal.* Data as of June 2018.

Hedge Funds

The primary benefit of hedge fund strategies is the ability to provide nontraditional and uncorrelated return premiums to the traditional portfolio, generally by producing alpha — returns not explained by risk exposures. Our 4.3% hedge fund return forecast represents the combination of expected alpha (0.4%) and the lower expected returns from risk exposures (3.9%). These are based on our risk factor model, which includes market, term, credit, size, value, momentum, emerging market, commodity and currency risk. We add an additional market factor (lagged by one month) to capture any accounting issues that might delay asset price "marks."

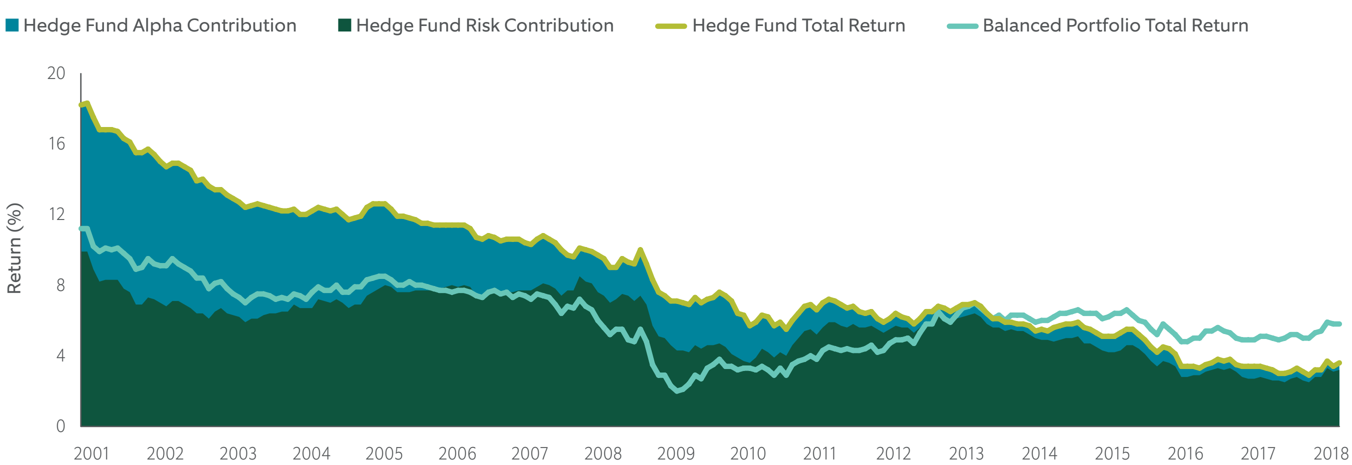
Exhibit 24 shows rolling 10-year hedge fund returns bifurcated between the risk (green area) and alpha contribution (teal area) — all based on the model described above. The hedge fund risk contribution has been fairly steady — though slowly declining — over time, largely tracking a balanced portfolio (50% global equities/50% global fixed income). This makes sense; hedge funds in aggregate are really just one large multi-asset-class portfolio, with notable exposure to equities (market risk).

As noted above, the primary way hedge funds add value — and earn their fees — is by generating alpha. Alpha generation of the broad HFRI Fund-Weighted Index has been deteriorating over time, from an annualized 8.2% in the 10-year period ending December 31, 2000, to an annualized 0.4% over the past 10 years. We use this trailing 10-year alpha as our baseline expectation for the next five years. But we acknowledge that individual strategies will vary greatly around that average alpha depending on manager skill. Hedge funds also can add value through nontraditional risk exposures, those not available to ordinary investors (and, therefore, indistinguishable from alpha).

Hedge funds can add value by producing alpha or through nontraditional risk exposures, those not available to ordinary investors.

EXHIBIT 24: INCREASING RISK RELIANCE

Alpha generation of the average hedge fund has been slipping over time, but varies significantly by manager.



Source: Northern Trust Global Asset Allocation, Northern Trust Portfolio Construction Desk, Bloomberg. Data from 12/31/2000 to 3/31/2018.

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	2018	2017	2016	2015	2014	2013	
Fixed Income	United States	Cash	3-Month U.S. T-Bill	2.2	1.7	0.5	1.5	0.9	0.5	0.5
		Inflation Linked	BBG BarCap U.S. TIPS	2.9	3.0	2.5	2.5	3.0	2.7	1.7
		Investment Grade	BBG BarCap U.S. Aggregate	3.6	3.2	3.0	3.0	3.0	2.8	2.3
		High Yield	BBG BarCap U.S. High Yield	4.9	4.8	5.3	5.6	5.6	6.1	5.5
		Municipal	BBG BarCap Municipal	3.2	3.2	2.8	3.5	4.0	3.0	3.5
	Europe	Cash	3-Month German Bunds	-0.3	-0.2	-0.5	0.0	0.4	1.0	-0.4
		Inflation Linked	BBG BarCap Euro Inflation Linked	1.2	1.5	1.4	1.8	2.8	3.2	3.9
		Investment Grade	BBG BarCap Euro Aggregate	1.8	1.5	1.4	2.0	2.8	3.0	3.6
	Japan	Cash	3-Month JGB	0.0	-0.1	-0.3	0.0	0.1	0.1	-0.1
		Inflation Linked	BBG BarCap Inflation Linked JGB	0.5	0.8	0.8	1.2	1.5	0.6	0.8
		Investment Grade	BBG BarCap Japanese Aggregate	0.5	0.7	0.5	1.0	1.2	0.8	2.2
	U.K.	Cash	3-Month Gilts	0.9	0.5	0.3	1.5	1.3	0.6	0.4
		Inflation Linked	BBG BarCap Inflation Linked Gilt	1.7	1.6	2.0	2.6	3.0	3.2	8.2
		Investment Grade	BBG BarCap Sterling Aggregate	2.5	2.5	2.6	3.0	3.7	3.5	5.4
	Canada	Cash	3-Month Canada T-Bill	1.6	1.3	0.7	1.5	1.3	1.5	0.8
		Inflation Linked	FTSE TMX Real Return Bond	2.3	2.5	2.5	2.5	3.2	3.2	4.0
		Investment Grade	FTSE TMX Universe	2.9	2.5	2.6	2.7	3.4	3.5	3.5
		High Yield	ML Canadian High Yield	4.5	4.5	5.0	5.6	5.6	6.1	6.1
	Aus.	Cash	3-Month Australia Gov't Bond	2.5	2.4	2.0	2.2	2.8	3.3	2.1
		Investment Grade	BBG BarCap Australian Composite	3.5	3.2	3.3	3.5	4.0	3.6	4.3
	Global	Global Aggregate	BBG BarCap Global Aggregate	2.7	2.2	2.1	2.5	2.7	2.6	3.3
		Global High Yield	BBG BarCap Global High Yield	4.6	4.5	5.3	5.8	5.8	6.5	5.9
		Emerging Market Debt	JP Morgan GBI-EM Diversified	5.8	5.3	5.5	6.5	6.0	7.0	6.1
Equities	Developed Markets	United States	MSCI United States	5.8	5.9	4.8	5.6	6.6	7.1	13.4
		Europe	MSCI Europe ex U.K.	6.3	7.2	5.3	6.8	8.2	7.8	10.8
		Japan	MSCI Japan	6.0	6.0	5.6	6.2	6.6	5.8	10.1
		United Kingdom	MSCI United Kingdom	6.3	6.6	5.9	7.0	8.6	8.4	7.9
		Canada	MSCI Canada	5.5	6.0	6.0	6.9	7.1	7.6	9.6
		Australia	MSCI Australia	7.7	7.7	8.0	8.1	9.1	9.4	9.8
		Developed Markets	MSCI World	6.0	6.4	5.4	6.1	7.2	7.4	11.7
	Emerg. Markets	Asia	MSCI EM Asia	8.8	8.9	8.0	8.5	10.0	9.9	9.6
		Latin America	MSCI EM Latin America	6.5	6.9	5.6	5.7	7.0	10.6	7.5
		EMEA	MSCI EM EMEA	7.5	7.3	6.0	6.5	7.9	10.4	4.9
		Emerging Markets	MSCI Emerging Markets	8.3	8.4	7.3	7.8	9.0	10.1	8.8
	Global	Global Equities	MSCI All Country World	6.2	6.9	5.8	6.5	7.4	7.7	11.4
Real		Natural Resources	S&P Global Natural Resources	7.2	7.4	6.9	7.0	7.0	7.2	5.0
		Listed Real Estate	MSCI ACWI IMI Core Real Estate	6.0	6.1	6.3	6.9	8.0	8.0	7.3
		Listed Infrastructure	S&P Global Infrastructure	5.4	5.8	5.6	6.2	7.0	7.5	8.0
Alts		Private Equity	Cambridge Global Private Equity	8.0	8.4	7.4	8.6	9.2	9.6	N/A
		Hedge Funds	HFRI Fund Weighted Comp	4.3	4.4	3.4	4.4	4.3	4.4	4.6

Forecasts listed here represent total return forecasts for primary asset classes, annualized using geometric averages. Forecast 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 6/30/2018.

Every year, Northern Trust's Capital Market Assumptions Working Group (CMA) 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.

CMA 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.

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ABOUT NORTHERN TRUST

Whatever Your Greater, We Can Help You Achieve It

For more than a century, Northern Trust has worked hard building our legacy of outstanding service, expertise and integrity. Founded in Chicago in 1889, Northern Trust has offices in the United States in 19 states and Washington, D.C., 23 international locations in Canada, Europe, the Middle East and the Asia-Pacific region, and 18,300 employees globally. We serve the world's most-sophisticated clients — from sovereign wealth funds and the wealthiest individuals and families, to the most-successful hedge funds and corporate brands.

Our guiding principles not only survived but thrived during the Great Depression, two world wars and the 2008 financial crisis. We burnished our reputation as a global leader delivering innovative investment management, asset and fund administration, fiduciary and banking solutions enabled by sophisticated, leading technology. And through it all, we continually laid a solid, forward-looking foundation on which future generations can continue growing and achieving greater.

As of June 30, 2018, Northern Trust Corporation had:

- $10.7 trillion in assets under custody/administration
- $8.1 trillion in assets under custody
- $1.1 trillion in assets under management
- $135 billion in banking assets

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