NORTHERN TRUST

CAPITAL MARKET ASSUMPTIONS

FIVE-YEAR OUTLOOK: 2019 EDITION

Recent strong risk asset returns, paired with sharply lower global interest rates, represent an atypical investing backdrop. Financial markets have been working through a mash-up of slowing growth, muted inflation and easier monetary/regulatory policy – all wrapped in rising political uncertainty and on-again/off-again trade tensions. Positive breakthrough prospects are evenly matched with dire scenarios.

Our outlook falls in between, which should result in decent risk asset performance and subdued fixed income returns during the next five years.

Against this backdrop, six key themes have emerged for our five-year outlook:

1 **GLOBAL GROWTH RESTRUCTURING** — A shifting economic model – due to geopolitical and technological developments – will slow growth.

2 **IRRECONCILABLE DIFFERENCES** — The fractious U.S.-China relationship will produce a cascade of geopolitical, economic and market changes.

3 **STUCKFLATION 4.0** — Muted growth in global demand and timid policy responses suggest stuckflation is here to stay.

4 **EXECUTIVE POWER PLAY** — Solid growth has pacified power grab concerns, but leaders are at risk of overplaying their hands.

5 **MONETARY MAKEOVER** — Stuckflation has left central banks without a North Star and seeking relevance as their independence is challenged.

6 **STAKING OUT CLIMATE RISK** — Climate risk regulatory impacts will slowly build, but with high dispersion and sporadic embracement.

2019 CMA FIVE-YEAR THEMES OVERVIEW

Global Growth Restructuring

A shifting economic model – due to geopolitical and technological developments – will slow growth.

To withstand shifting political winds and growing technology application, the global economy must evolve. We expect big changes to legacy global trade frameworks. Globalization 2.0 as a moniker is too sanguine; a more appropriate term is Globalization 0.5 – a step backward from what is optimal. While technology can help paper over the cracks, it brings its own challenges (i.e., security and inequality concerns). As with any restructuring, the global economy must endure continued slow growth pain – and risk of recession – to emerge stronger in the new world we find ourselves in.

Executive Power Play

Solid growth has pacified power grab concerns, but leaders are at risk of overplaying their hands.

Investors have tolerated political power grabs in exchange for pro-growth policies that have allowed for the continued equity bull market. But this tradeoff will prove challenging when growth slows or should power shift to leaders with less business-friendly agendas. As such, our *Executive Power Drive* theme from last year has evolved. Investors have given executive leaders some leash, but will still judge them on their economic acumen (see the investor response to authoritarian rule in Turkey as a recent example). Truly strong leaders will balance the populist movement with sensible economic policy. The risk is that they focus too much on the former.

Irreconcilable Differences

The fractious U.S.-China relationship will produce a cascade of geopolitical, economic and market changes.

A focal point of *Global Growth Restructuring* is the tense relationship between the United States and China, which will remain tense due to irreconcilable differences between the world's two economic superpowers. The two have diametrically opposed views on the best economic model, the role of government and the role each should play in global affairs – all exacerbated by distrust. Importantly, these differences are likely to transcend any change in U.S. leadership. The result will be a diplomatic dance that meanders between economic armistice and war, but never peace – leaving other countries to decide how to align.

Monetary Makeover

Stuckflation has left central banks without a North Star and seeking relevance as their independence is challenged.

Persistently low inflation has stripped central bankers of their purpose. Try as they might, no monetary policy prescriptions – at least none that central bankers are bold enough to try – will remedy continued *Stuckflation*. Similarly, no central bank-driven initiatives can address the insufficient level of global demand. This task is the responsibility of fiscal and broader economic policy – controlled by politicians. As such, central bankers will increasingly be subservient to political agendas. No political leader wants anything other than easy monetary policy. As long as inflation remains stuck, they will get it.

Stuckflation 4.0

Muted growth in global demand and timid policy responses suggest stuckflation is here to stay.

Little has changed in our stuckflation theme (now four years running). Most major central banks continue to miss their 2% inflation targets, and supply-side forces driving the shortfall remain strong. Technological innovations, along with vast troves of data, are enhancing price discovery and optimization techniques globally. This is reflected in low interest rates and flat yield curves. We anticipate ongoing inflation disappointment to eventually lead to a coordinated policy response. But until we see urgency on the matter, we stick to our stuckflation outlook.

Staking Out Climate Risk

Climate risk regulatory impacts will slowly build, but with high dispersion and sporadic embracement.

As the world tries to reconcile growing carbon emissions with Paris Agreement commitments, the topic of climate risk becomes more important. It highlights that even though the direct physical risks of climate change are still small, the transition risk associated with regulatory change is slowly building. Investment categories with direct exposure to transition risk now require special attention. However, dispersion between countries will be high, and transition risk can be reversed when confronted by political backlash – and, in some cases, already has.

FIVE-YEAR FORECAST SUMMARY

Fixed Income

Low-but-positive returns will persist, as yield curves globally continue to test investor expectations for what is possible.

Interest rates will move back toward the lower end of their post-financial crisis range. Driving the continued low interest rate environment are the same factors that have been around for much of the last decade: *Stuckflation* and slow growth (referred to as *Global Growth Restructuring* in this year's edition). Downward pressures on interest rates will be increased by a *Monetary Makeover*, wherein central banks reluctantly move further into unprecedented policy prescriptions as they struggle to remain relevant.

Credit spreads – both investment grade and high yield – will be caught in a tug-of-war between a modest deterioration in the fundamental backdrop (due to slower revenue growth) and the renewed search for yield (as interest rates continue to fall). We anticipate modestly lower fixed income returns than we did last year – mostly due to the fall in interest rates – but still do not see a reversal of the nearly 40-year structural decline in yields across the fixed income universe.

Equities

Global equity returns will be below long-term historical averages – a consequence of the slow growth environment.

Developed market equities will provide annualized returns in the mid-single-digit range. Valuations, while still elevated, have moved to more reasonable levels over the past couple years. Valuations could still move slightly lower as we reach the later stages of this economic expansion, but will remain within a higher structural range supported by low interest rates and milder economic cycles. Late-cycle margin pressures will be similarly muted by low inflation and interest rates, allowing for modest earnings growth.

Emerging market equity valuations are below long-term averages, and may remain low given our *Global Growth Restructuring* theme. Meanwhile, higher top-line growth will be offset by greater aggregate share issuance, bringing bottom-line forecasts closer to those for other developed markets. We expect emerging market equities to provide only a modest return premium to developed market equities.

Real Assets

Real asset returns will be largely in line with equities; interest-rate-exposed asset classes will be highly valued in portfolios.

Natural resources' low valuations (relative to broader equities) are explained by the slow growth environment and some increased focus on climate risk. Still, natural resources play an important role in the diversified portfolio as a source of protection against unexpected inflation and (more recently) increased dividend yields.

Global real estate will be supported by its exposures to term (interest rate) and credit risk, both of which we expect to be positive influencers. Much of the negative impact from the shift to the digital economy has been priced into valuations, but rent pressures will nevertheless continue.

Global listed infrastructure can provide downside mitigation to the investment portfolio and an alternative to global real estate for term risk exposure. The public-to-private transfer of infrastructure projects and focus on climate risk have opened up a new set of opportunities.

Alternatives

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

Given higher valuations and increased asset flows to private equity funds, investors have questioned expected private equity return premiums. But illiquidity premiums and alpha generation have remained solid, especially for managers investing in smaller deal sizes. Our forecasted 2% return premium to global equities has been conservative in relation to recent results from small to mid-sized managers.

Hedge funds derive their value from the generation of alpha – returns not explained by risk exposures already in the investment portfolio. For the average hedge fund, alpha has been steadily shrinking over the past 30 years. Our low-single-digit hedge fund return expectation assumes this low average alpha, but we recognize the dispersion across individual strategies. The selection process is paramount.

GLOBAL GROWTH RESTRUCTURING

The global economy will require some restructuring to ensure it runs optimally in the longer run. And, just as companies generally don't restructure willingly, the global economy is being forced into this restructuring, primarily by two environmental forces:

1) growing trade tensions requiring global supply chain recalibrations; and

2) evolving technology that is leading to increased security concerns, heightened inequality and a need to retrain workers.

Done right, restructuring can lead to a stronger, more resilient business (or, in this case, economic) model. But the transition can be painful. When combined with lowered demand due to aging demographics and heightened debt loads, the global economy's pain during its restructuring will be in the form of lower growth rates.

Trade tensions have escalated between the U.S. and China over the past year (something we further address in our *Irreconcilable Differences* theme). However, global trade, as a percentage of the global economy, actually peaked around the time of the global financial crisis. U.S. trade as a percentage of the U.S. economy also peaked around that time. Meanwhile, Chinese trade as a percentage of the Chinese economy peaked in 2005 and has notably fallen over the past decade, although much of that is tied to the rise of the Chinese consumer and the resulting shift toward internal demand.

Technology has played a part in global trade's slight retreat over the past decade (with "onshoring" now a C-suite buzzword as automation advances have reduced the comparative advantage of low-wage countries). And technology will also prevent recent trade disturbances from turning into something more deleterious. Tariffs on goods traded between the U.S. and China have been in place for a year now; and while the Chinese economy has shown a noticeable slowdown, the U.S.

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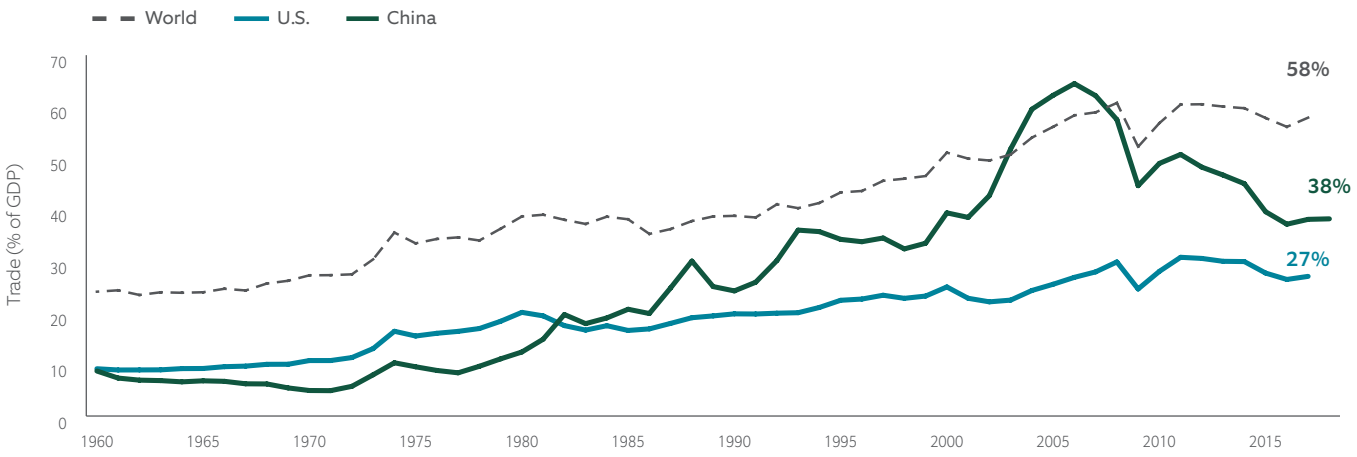
EXHIBIT 1: PEAK GLOBAL

Global trade peaked around the time of the financial crisis and is set to trend lower.



Source: Northern Trust Global Asset Allocation, World Bank. Yearly data from 12/31/1990 to 12/31/2017. China data through 2018.

economy has continued to grow at a respectable 2.3% clip. But technology is introducing new challenges. Consulting firm McKinsey & Company estimates that 40% of all workers are in industries that will lose jobs to automation by 2030. This is no longer an "over the next few decades" type analysis – an issue always "out there" but never really having a material near-term impact. Instead, a lot of this is within our five-year horizon. This is real and upon us – and many will be surprised at how quickly the economic landscape changes. Companies are quickly realizing that retraining employees will be a key piece of the restructuring ahead. Meanwhile, governments will realize that tweaks will need to be made to the current economic system in order to avoid the proliferation of "winner-take-all" economic situations exacerbating inequality. But this must be done intelligently to ensure that incentives for hard work and ingenuity are preserved. It will take time, and may cause economic disruptions over the next five years.

Overall, we expect the global economy to experience annualized real growth of 2.2% over the next five years, a decrease from last year's five-year forecast of 2.5%. The U.S. and China are expected to grow at an annual pace of 1.7% and 3.0%, respectively (the latter representing a more realistic economic growth rate than official government figures would suggest). Both economies will be hampered by *Irreconcilable Differences*, though China will likely be hit harder. The U.S. expansion – even at 10 years old – should avoid recession over the next five given *Stuckflation* and easy monetary policy, but years of near-zero growth are entirely possible given low demand and impending restructuring. Meanwhile, the European Union is expected to grow at a 1.3% annualized pace. The monetary union will survive (and looks stronger today than five years ago) but slow progress on unions of other sorts (fiscal, political and banking) will hamper growth. Growth rates across other major developed markets are expected to similarly slow over the next five years (see Exhibit 2).

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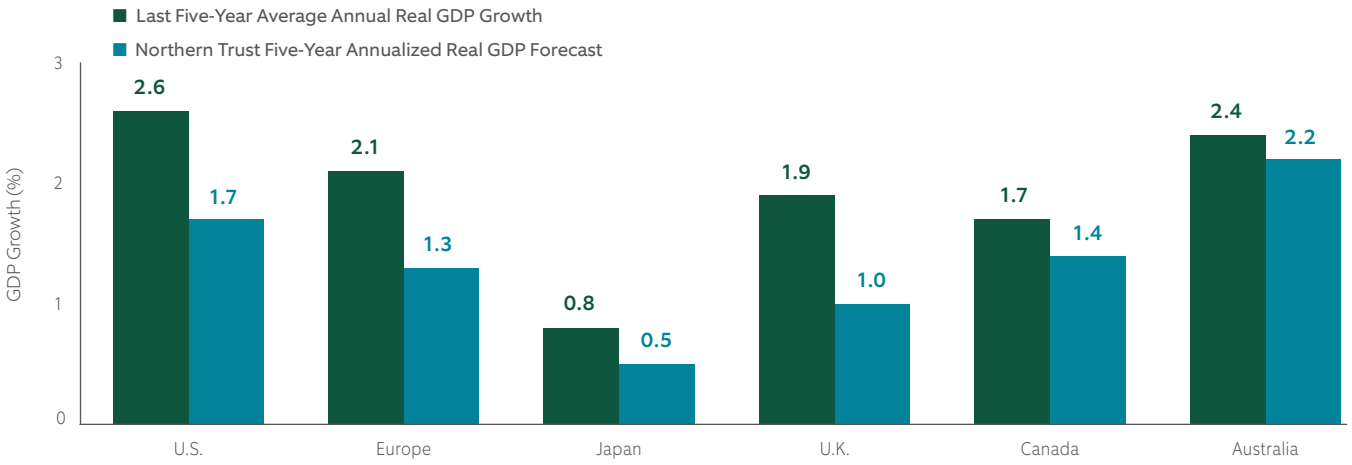
EXHIBIT 2: SLOW GROWTH EXPECTED TO CONTINUE

Our growth expectations call for a continuation of the "muddle through" environment.



Source: Northern Trust Global Asset Allocation, Bloomberg. Data from 3/31/2014 to 3/31/2019.

IRRECONCILABLE DIFFERENCES

Investors are looking for a resolution to the tensions between the U.S. and China. But we don't see this happening over our five-year horizon. This is more than a battle over what the U.S. is claiming are unfair trade practices. It extends to a diverse array of topics from intellectual property protection to the shaping of the global economic model for years to come. Indeed, one major element of this battle is the U.S. trying to protect its status as the world's lone superpower. The last changing of the superpower guard – from the United Kingdom to the United States in the early 20th century – went smoothly. But that was between two countries with a common language, a shared history and a mutually held view of the optimal economic model. The transition formed the "special relationship" that remains to this day. The U.S.-China relationship – having none of those things in common – will never have such a superlative attached.

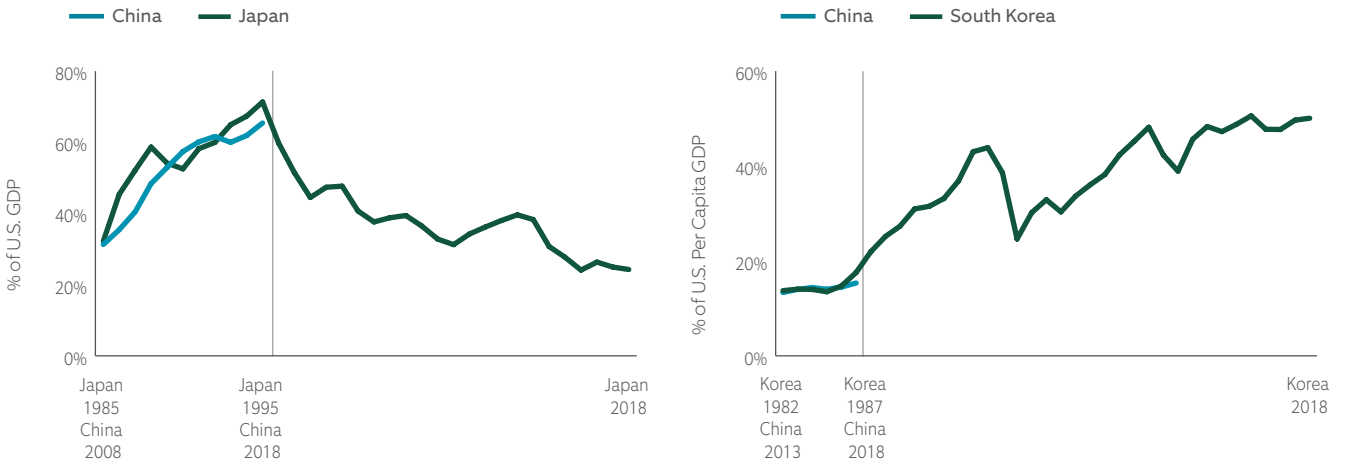
While we do not believe globalization is dead, we do believe it has peaked.

Last year's *Global (Re)Positioning System* theme posited that "The new global system [would] be a blend of both free market and managed capitalism – a 'repositioning,' not a complete overhaul." After a year of hardening positions between the U.S. and China, this view has proven optimistic. Negotiations will likely continue – but in a "stop-start" manner that won't result in a true or final deal any time soon. There are simply too many *Irreconcilable Differences*. In the Financial Times[1], Gideon Rachman described the two countries' positions as mirror images of each other: "Mr. Xi wants to change the world's strategic order [of superpower hegemony], and to do that he needs to maintain its economic order [of globalization]. Mr. Trump wants to preserve the strategic order, and to do that he needs to change the economic order." Because we believe Democrats agree with Trump on this issue, and Xi has secured "president for life" status, we see these positions continuing into the future. As a result, while we do not believe globalization is dead, we do believe it has peaked. And a new "one world, two

[1] Rachman, G. (2019, May 13). America is the revisionist power on trade. Financial Times. Retrieved from www.ft.com.

EXHIBIT 3: PEAK CHINA?

Questions surround China's ongoing growth in both aggregate and per capita terms.



Source: Northern Trust Global Asset Allocation, IMF. Data from 12/31/1980 - 12/31/2018.

systems" dynamic (America's capitalism vs. China's statism) will continue to grow and evolve in a detrimental way.

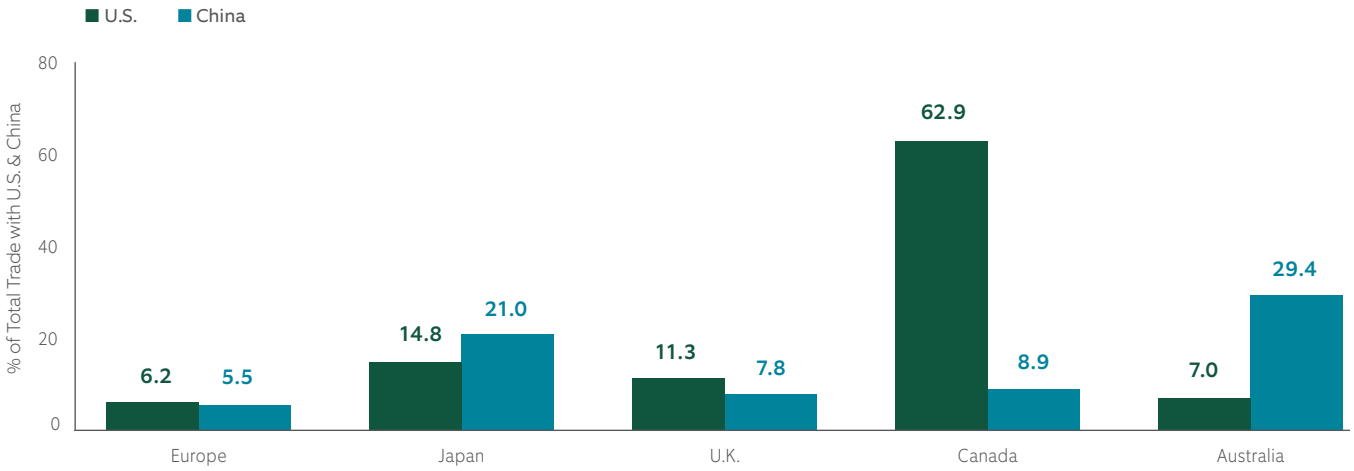
The first question: How is this resolved? History would suggest that capitalism will (eventually) win out. The Cold War (which culminated with the Soviet Union's collapse) is the most often cited example, although the Soviet Union was never the economic power that China is today. China does have parallels to the Japan of three decades ago (see Exhibit 3) when the "land of the rising sun" looked set to become the world's largest economy. But just as aging demographics caught up to Japan, they are catching up to China today (China's working age population peaked in 2014). Still, China has more people (1.4 billion) and more room for per capita economic growth (its per capita income – at $9.6k – is one-sixth that of the United States). But Japan had a devotion to capitalism that China does not. No country has exited the "middle income trap" without embracing capitalism. Currently, China is going in the opposite direction, with growing government interference in the private sector. If this continues, China's ability to mirror Korea's per capita economic rise (see Exhibit 3) may prove challenging.

The second question: What do other countries do in the meantime? As the U.S. and China remain at odds, the rest of the world will have to balance relations with each. Diplomatic and economic ties will drive the alignment of each country. This is straightforward for a country like Canada, for which the U.S. is a closer diplomatic and trading partner. For one such as Australia, which has close ties to the United States but where China represents nearly 30% of trade, the decision is more difficult. Ultimately, many countries will try to appease both and/or work to get around tariffs/sanctions. The result will be global economic inefficiencies that we believe will hamper growth.

No country has exited the "middle income trap" without embracing capitalism. Currently, China is going in the opposite direction, with growing government interference in the private sector.

EXHIBIT 4: PICK A SIDE

As U.S.-China tensions continue, other countries will have to weigh economic effects.



Source: Northern Trust Global Asset Allocation, IMF Direction of Trade Statistics. Updated as of 7/7/2019. Total trade = Exports + Imports.

STUCKFLATION 4.0

Stuckflation – now in its fourth year as a theme – remains a key tenet of our five-year outlook. Central bankers simply have not hit their 2% inflation target. Exhibit 5 shows the percentage of time in the past decade that core inflation has been above 2% across various regions. If 2% were the true target, we would expect inflation to be above that level 50% of the time. But the U.S., Europe and Japan – the three largest developed economies in the world – have missed their targets badly. Europe hasn't seen 2% inflation in more than a decade.

All of the previous drivers are still in force – both on the demand and supply side. Global economic demand remains muted as populations continue to age, technology feeds worker insecurity (prompting greater saving) and the global economy restructures. However, the bigger driver of stuckflation is the way in which technological innovation is enabling supply to meet this muted demand easily. Here are a few of the countless examples:

- Fracking and other technological advancements have allowed for easier oil reserve discovery and recovery over the past five years, capping oil prices.
- The "sharing economy" (think Uber, Airbnb, etc.) has tapped into a massive amount of unused capacity, putting to work otherwise idle resources.
- Online commerce has enabled price comparisons and deal finding; studies have found online price increases to be well below official inflation statistics.

For many years, we have been puzzled as to why these supply forces were not appearing in the official productivity measures. Our 2015 *Productivity Paradox* theme (the predecessor to *Stuckflation*) captured this confusion, noting the dichotomy between the official productivity metrics (which showed the lowest level of productivity in decades) and the low inflation data (combined with –

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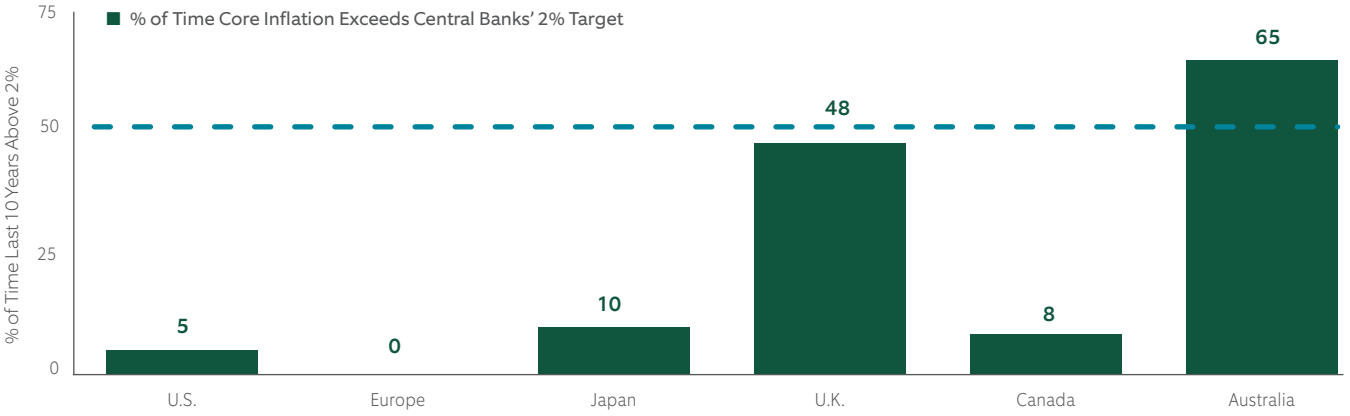
EXHIBIT 5: A 2% INFLATION CEILING, NOT A 2% TARGET

A 2% inflation target means spending 50% of the time above that level. This has not been the case.



Source: Northern Trust Global Asset Allocation, Bloomberg. Data from 5/31/2009 to 5/31/2019. All regions use core Consumer Price Index except for the U.S. which uses core personal consumption expenditures. Australia data is calculated quarterly using a trimmed mean core Consumer Price Index.

frankly – what we could observe with our own eyes). We surmised it was a calculation problem, with the official productivity readings artificially pressured by weak demand, and that supply would be more than able to keep up with demand should the latter ever pick up. The recent U.S. experience has supported this view. Despite the U.S. growth spurt of the past few years, inflation has remained below 2%. Instead, productivity numbers have stepped up (averaging 2.4% over the past year vs. an average of 0.8% the prior five). As a result, year-over-year unit labor costs have trended downward (-0.8% as of the last reading, vs. 1.8% at the end of 2015). The Stuckflation theme continues, and the productivity data is finally agreeing.

Overall, we expect inflation to remain stuck around the world, with five-year annualized inflation expectations ranging from 1.0% in Japan (generally structurally low) to 2.0% and 1.9% in the U.K. and Australia, respectively (generally structurally high). Rounding out the large developed economies, we expect inflation of 1.7% in the U.S., 1.5% in Canada and 1.0% in Europe. All of these expectations are fairly consistent with what has been experienced, on average, over the past five years (see Exhibit 6) and most remain below the general 2% central bank target. While our base case calls for continued stuckflation, we are increasingly focused on the prospects of a coordinated policy response between monetary and fiscal authorities to finally break the disinflationary trap. The quickest way back to an inflationary environment would be the inefficient use of newfound funding from central banks (described further in *Executive Power Play* and *Monetary Makeover*). At the moment, global supply/demand forces that have kept inflation muted remain strong enough to offset any near-term *Monetary Makeover* impacts. But our *Stuckflation* theme could transform into a fully coordinated *War on Stuckflation* with the "right" (wrong?) policy makers in place.

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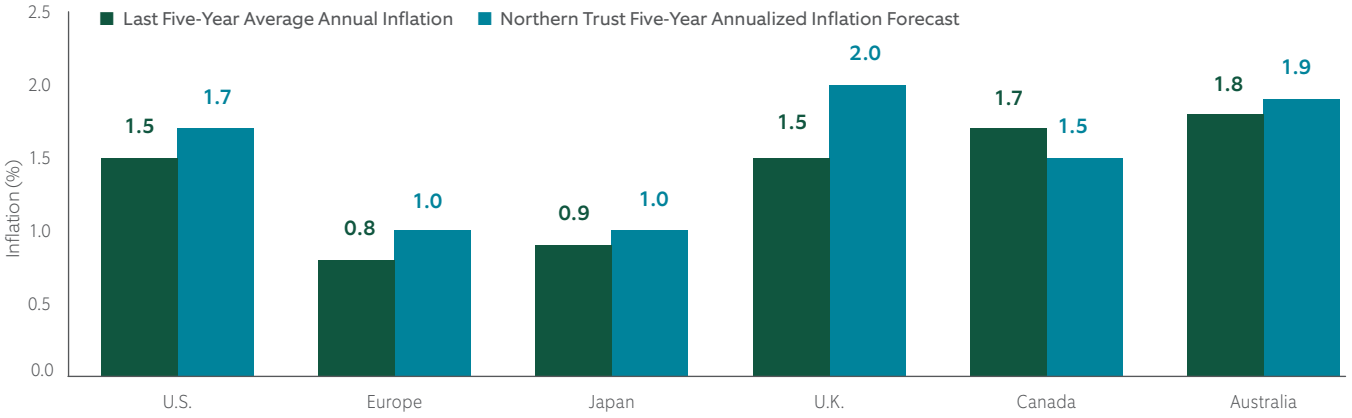
EXHIBIT 6: STILL STUCKFLATION

We believe inflation will remain below central banks' 2% target for an extended period.



Source: Northern Trust Global Asset Allocation, Bloomberg. Data from 3/31/2014 to 3/31/2019. All regions use core Consumer Price Index except for the U.S. which uses core personal consumption expenditures.

EXECUTIVE POWER PLAY

Executive Power Play is an evolution of last year's *Executive Power Drive* theme. Part of the inspiration is from the game of ice hockey, in which the team awarded a power play is given a prime opportunity to score with the other team temporarily down a player. But it also comes with high expectations to deliver. Last year's *Executive Power Drive* theme noted that "investors are accepting leaders who challenge political norms in order to favorably tilt the economic landscape." This has played out. The best example is in the U.S., where anti-establishment President Donald Trump has presided over a strong economy and investors have driven the U.S. stock market up by 9% over the past year (vs. 5% for global equity markets) and 44% since his election (vs. 36%). But there are other examples as well. The Indian stock market has shown similar outperformance vs. other emerging markets under populist Prime Minister Narendra Modi's watch. Meanwhile, the Brazilian stock market – up 32% – has seen a resurgence since President Jair Bolsonaro was voted in late last year (though this follows a period of recession-induced underperformance).

But failing to deliver economic results can represent a huge loss of momentum for the country that voted in the populist leader. Turkey is a prime example of a country where executive power, if taken too far, can lead to poor outcomes. Within emerging markets, currency movements represent a good report card on economic success – and, in the case of Turkey, that indicator suggests a failing grade. As seen in Exhibit 7, Turkey's lira has trailed a basket of other currencies by 15% annually since President Recep Tayyip Erdoğan was put into office. It has performed better more recently, matching the performance of the currencies overseen by other populist leaders, but that has come after a 65% cumulative drawdown. The lesson here is clear. Investors will accept – in fact, support – populist leaders as long as they do not cause undue harm through over-aggressive or anti-growth economic policy.

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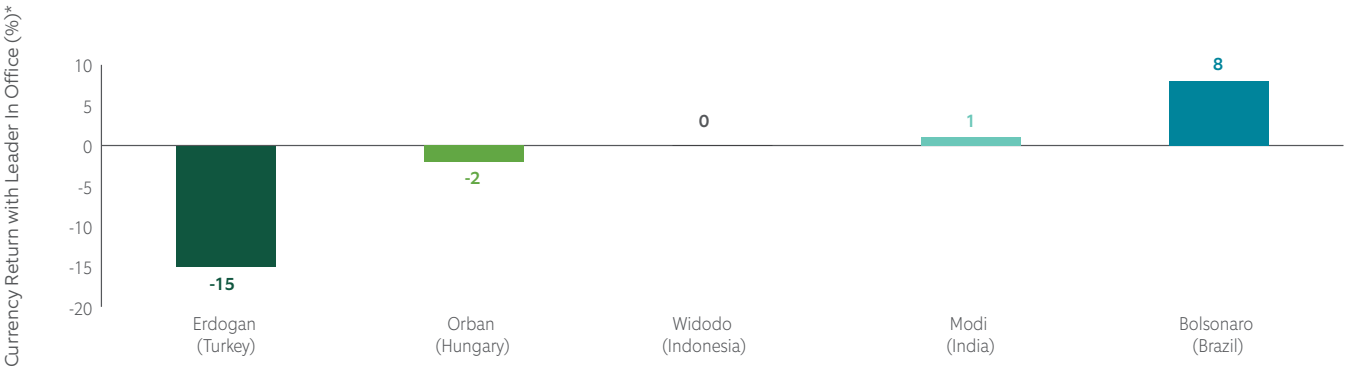
EXHIBIT 7: POPULIST SCORECARD

Populism — as judged by currency returns — has been a benign force, except in rare circumstances.



Source: Northern Trust Global Asset Allocation, Bloomberg. Currency return in office through 6/30/2019. Elected dates: Modi 5/12/2014; Widodo 7/9/2014; Erdogan 8/10/2014; Orban 4/25/2010; Bolsonaro 10/28/2018. *Returns are annualized and relative to a basket of currencies.

aggressive or anti-growth economic policy. Investors will ignore tough rhetoric – even if the leader is viewed as lacking the appropriate decorum of the office – and will instead focus on actions.

In fact, in the U.S., a great deal of Trump's unconventional approach to governing has been ignored by investors, who are more focused on pro-growth policies such as tax reform and deregulation. These policies have boosted U.S. economic growth. But there is a real risk that policies move away from pro-growth while the unconventional governing remains in place. This is a bipartisan observation – Republicans and Democrats are both moving further right and left, respectively. If economic policies become similarly more extreme – either causing recession or prompting inflationary pressures – investors will apply more scrutiny. Developments leading up to the 2020 U.S. elections will be telling – and will likely receive heavier focus in next year's Five-Year Outlook.

Europe – the world's other populist hotspot – has also seen a noticeable shift away from its political center. The shift in the European Parliament as a result of this year's elections can be found in Exhibit 8. The traditional center – the European People's Party and the Socialists & Democrats – lost seats and, importantly, their combined majority. However, the votes they lost only traveled one level, either to the right, to Renew Europe, or the left, to Greens/European Free Alliance. The true populists/nationalists did gain some seats, but the increase was smaller than the headlines suggested. Applying the lessons learned above, investors focus more heavily on actions than words. The rhetoric out of the new, more fragmented parliament may be louder, but the actions should still keep the European Union intact. Recent leadership choices support this view.

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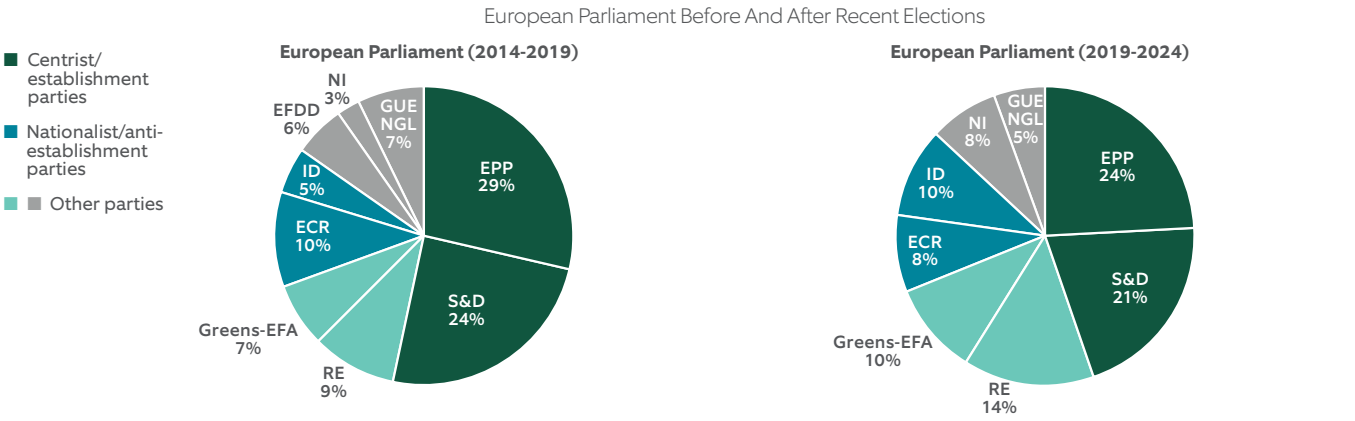
EXHIBIT 8: MORE VOICES TO BE HEARD

The European Parliament has shifted toward more nationalist/populist political parties.



Source: Northern Trust Global Asset Allocation, European Parliament. Abbreviations: EPP (Group of the European People's Party (Christian Democrats)); EFDD (Europe of Freedom and Direct Democracy); S&D (Group of the Progressive Alliance of Socialists and Democrats); RE (Renew Europe); Greens-EFA (Greens-EFA (Group of the Greens-European Free Alliance)); ID (Identity and Democracy); ECR (European Conservatives and Reformists); GUE-NGL (Confederal Group of the European United Left-Nordic Green Left); NI (Non-Inscrits).

MONETARY MAKEOVER

As discussed in *Stuckflation 4.0,* the probability of inflation going persistently above the 2% level over the next five years is low. This leaves central bankers without what has been their key focus as far back as the stagflation days of the 1970s – inflation fighting. Back then, they were able to independently fix rampant inflation using the interest rate setting tools at their disposal, even if it meant pushing the economy into a severe recession. Conversely, they cannot fix today's stuckflation problem without help from policy levers outside of monetary policy. The past decade – even with all of central bankers' newfound approaches applied (quantitative easing, anyone?) – has shown that to be the case.

As seen in Exhibit 9, the world's leading central banks have seen their balance sheets explode since the financial crisis. The Federal Reserve's balance sheet is three times the size it was in 2007; the European Central Bank's is twice as big. Meanwhile, the Bank of Japan's balance sheet has ballooned to five times its 2007 size to become the size of the entire Japanese economy, and the Bank of England's balance sheet has grown by a multiple of 10. Discussions over "tapering" have died; balance sheets are staying big and, in some cases, growing even bigger. This has been our call for some time (see *Waiting for Monetary Godot,* 2017).

In a world lacking inflationary pressures, central bankers will be looking for ways to remain relevant. This means greater coordination with fiscal policy, which represents the only hope of getting back to normalized inflation levels. The risk is that this puts central bankers at the whim of whoever is in office, possibly leading to inappropriate policy prescriptions. To wit, Modern Monetary Theory (MMT) – the idea that monetary policy should serve as fiscal policy's pocket book (through money printing), enabling political leaders to hit economic growth and inflation goals – has gained traction over the past year. MMT is not new. Seniorage – the

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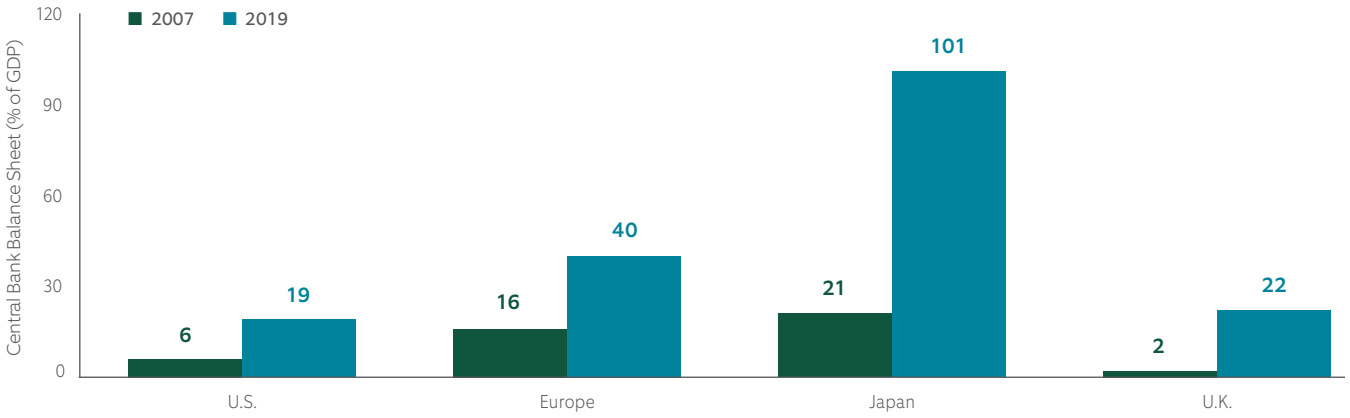
EXHIBIT 9: NO GOING BACK

Central bank balance sheets have ballooned—and will stay inflated.



Source: Northern Trust Global Asset Allocation, Bloomberg. Data as of 12/31/2007 and 3/31/2019.

difference between the intrinsic and stated value of money – has been exploited throughout history. The centuries-old practice of shaving down gold coins to fund rulers' desires (back then, usually war) can be done today by electronically adding zeros – the most salient example being quantitative easing.

The question is not whether central bankers will engage in "MMT". They already effectively have, which hasn't created problems in a stuckflation world. Instead, the questions are how much will be used and how it is put to work. Let's start with the latter. Different political leaders will have different priorities. For example, in the U.S., Republicans would target continued low taxation policy; Democrats would be more interested in exploring green initiatives (Green New Deal) and inequality (permanent income). Regardless, the key takeaway is that central bankers will increasingly cater to politicians (making *Monetary Makeover* subservient to *Executive Power Play)*. Accordingly, our focus is shifting to understanding the impacts of expected government policy in lieu of projecting monetary policy.

The first question will be driven by each central bank's willingness and ability. Per the above, the willingness of all central banks is growing as they seek to remain relevant. Ability is also increasing on the basis of the stuckflation environment. But within that broader construct, some central banks are more willing and able than others. We rank the four major central banks along these lines in Exhibit 10. The Fed has the greatest ability, but has not yet broken through all conventional barriers (think negative rates) and may be more hesitant to do so. The ECB, once obsessed with fighting inflation, has shifted its focus to defending the euro; the willingness exists but its ability may be limited by already uber-easy policy. In all cases, however, the prospect of tighter monetary policy over the next five years – once viewed by many investors as a certainty – is now unlikely.

The prospect of tighter monetary policy over the next five years – once viewed by many investors as a certainty – is now unlikely.

EXHIBIT 10: COULD OF, WOULD OF, SHOULD OF?

Degree of future easing will be driven by a combination of central banks' ability and willingness to act.

Ability & Willingness Dashboard

Central Bank	Federal Reserve	Euro. Central Bank	Bank of Japan	Bank of England
Main Policy Rate (%)	2.25	0.00	-0.10	0.75
Balance Sheet (% of GDP)	19	40	101	22
Ability (1 = highest)	1	3	4	2
Willingness (1 = highest)	3	1	2	4

Source: Northern Trust Global Asset Allocation, Bloomberg. Current policy rate data as of 7/31/2019. Current balance sheet data as of 3/31/2019.

STAKING OUT CLIMATE RISK

After plateauing between 2014 and 2016, global CO_2 emissions have begun rising again over the past few years. In response, climate activists are more vocal than ever in demanding action, shining their spotlight on every part of society that is contributing to this trend. As a result, it has become an important time for investors to think about what climate risk is and its potential implications.

With respect to our five-year outlook, climate risk is the threat that global warming could negatively impact economic growth, inflation and investment returns. We differentiate between two types of climate risk: physical risk and transition risk. Physical risk is the risk of damage to land, buildings or infrastructure owing to the physical effects of climate-related factors such as droughts, storms and flooding. Transition risk is the risk to businesses or assets that arises from policy, legal and market changes as the world seeks to transition to a lower-carbon economy.

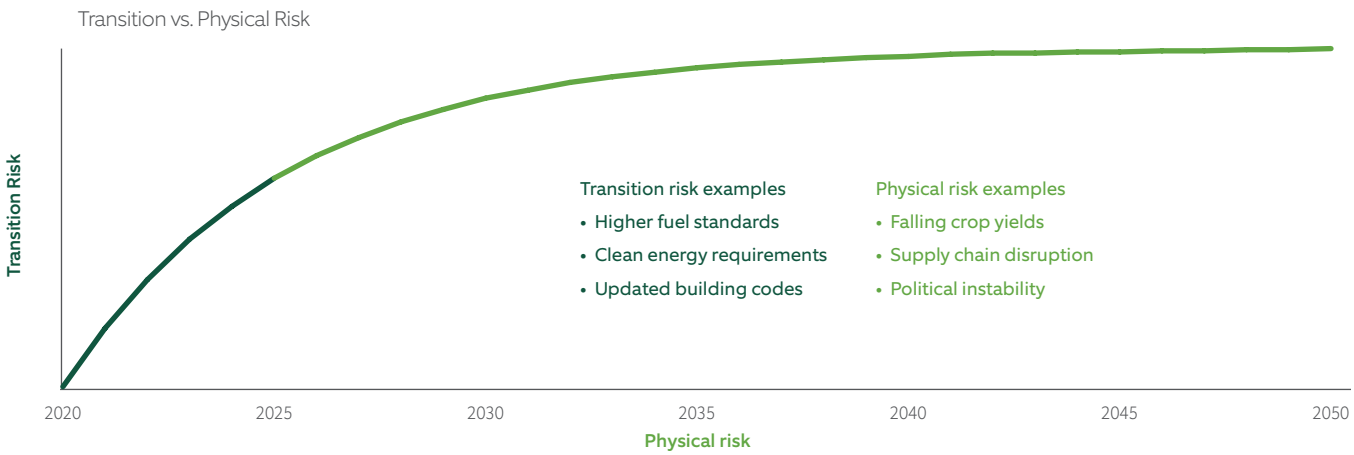
Conceptually, Exhibit 11 demonstrates the expected growth of these risks over the decades to come. Rising transition risk dominates in the decade ahead as a worsening emission trajectory becomes the focal point of a regulatory response. From 2030 to 2050, transition risk and physical risk will rise almost in unison, with transition risk rising in tandem with the emission trajectory and physical risk growing as the world surpasses 1.5°C of warming. From 2050 to 2100, physical risks are expected to dominate should the world warm past 1.5°C.

The line in Exhibit 11 will evolve differently depending on the pace and severity of global warming. Even more, transition risk is political in nature and can be expected to move in cycles, especially in different economic growth environments. For instance, in times of weak economic growth, voters – and therefore politicians – may be biased toward economic vs. environmental security. Meanwhile, better economic growth may allow for more environmental focus.

Climate risk is the threat that transition or physical risks could negatively impact economic growth, inflation, and investment returns.

EXHIBIT 11: PREPARING FOR THE STORM

Any climate risk impacts over the next five years will be mostly caused by the preparation for it.



Source: Northern Trust Global Asset Allocation.

The Intergovernmental Panel on Climate Change (IPCC) has provided four main scenarios for future CO_2 emissions and associated global warming projections (see Exhibit 12). In effect, each scenario has a certain "carbon budget." As the world uses up that budget, future physical climate risks will increase along with the likelihood of a regulatory response. We believe full implementation of the Paris Agreement is aligned with the Representation Concentration Pathway (RCP) 4.5 – but achieving this "carbon budget" may prove difficult should we see the political pushback identified on the prior page.

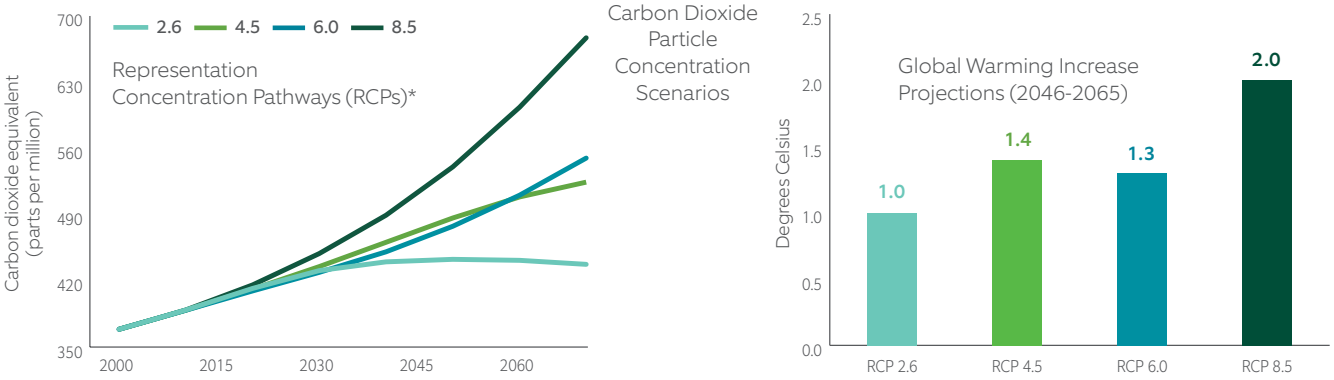
It is clear from the scenarios that climate risk has a long lead time. As such, we do not expect it to have a noticeable impact on economic growth and inflation over the next five years. We do, however, expect some transition risk to be priced in by financial markets in the most exposed asset classes, notably natural resources and global listed infrastructure.

Due to the large carbon-based fuel exposure of natural resources, the discounting of future transition risk will act as a headwind; as such, we have lowered our return expectation. The reverse is true for global listed infrastructure. Large investments will be made in areas like sustainable energy, electricity grids and water management. These investments represent growth opportunities and we have increased our return expectation in response. The real assets section provides further detail on these forecasts.

It is clear from the scenarios that climate risk has a long lead time. As such, we do not expect it to have a noticeable impact on economic growth and inflation over the next five years.

EXHIBIT 12: SCENARIO TESTING

Future greenhouse gas concentrations will be dependent on steps taken over the five-year horizon, as shown in these climate-warming RCP scenarios.



Source: Northern Trust Global Asset Allocation, Assessment Report by the United Nations' Intergovernmental Panel on Climate Change (IPCC).* Four representation concentration pathways (RCPs) were selected by the IPCC and defined by their total radiative forcing (cumulative measure of human emissions of greenhouse gases from all sources expressed in watts per square meter) pathway and level by 2100. The RCPs were chosen to represent a broad range of climate outcomes, based on a literature review, and are neither IPCC forecasts nor policy recommendations.

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) investors require to assume the risk of investment impairment due to issuer insolvency (credit risk).

Term structure is dependent on the economic and monetary policy outlook. In simple terms, central banks control 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 an example, if the Federal Reserve is expected to maintain rates at 2% for five years and then increase rates to 3% for the subsequent 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.

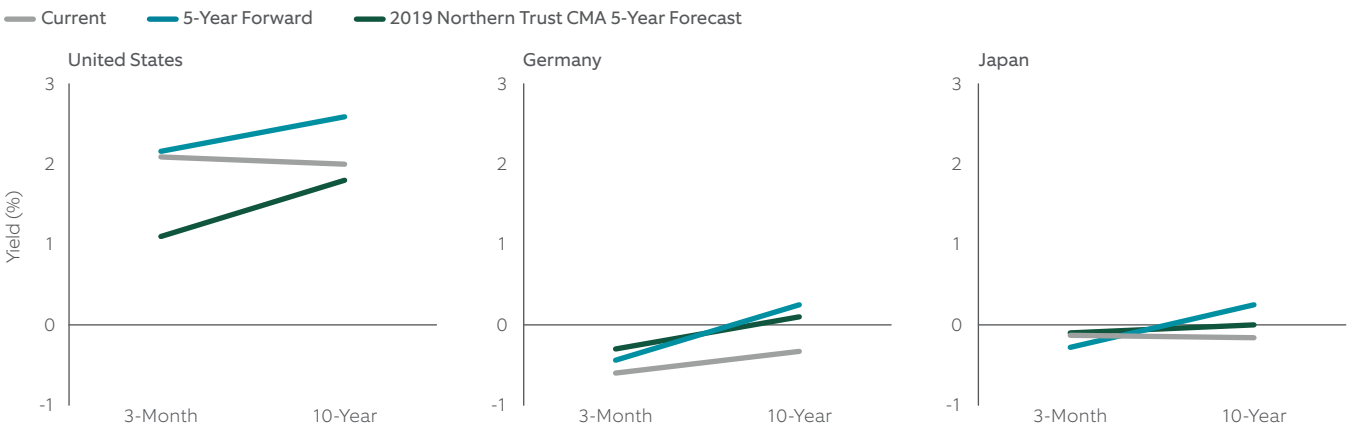
Our *Global Growth Restructuring*, *Stuckflation 4.0* and *Monetary Makeover* themes set the stage for a new global easing cycle (kicked off by the Federal Reserve and its 0.25% rate cut in July). Alongside the new global easing cycle, we expect steeper yield curves. This is not because we expect long-term rates to materially rise (in fact, we expect them to fall slightly in the U.S.), but because we expect short-term rates to fall by a greater amount.

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.

EXHIBIT 13: CONTINUED LOW RATES BUT SLIGHTLY STEEPER CURVES

Mild growth and Stuckflation will keep interest rates low but yield curves should steepen.

Government Bond Yield Curves (3 Months To 10 Years)



Source: Northern Trust Global Asset Allocation, Bloomberg. Current and 5-year forward data as of 6/30/2019.

Our five-year forward interest rate forecasts (vs. market expectations) across 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	1.1%	2.2%	1.8%	2.6%
Europe (Germany)	-0.3%	-0.4%	0.1%	0.3%
Japan	-0.1%	-0.3%	0.0%	0.3%
United Kingdom	0.1%	0.7%	0.8%	1.6%
Canada	0.6%	1.5%	1.3%	1.8%
Australia	1.0%	1.5%	1.5%	1.9%

Europe is looking ever more like Japan, whose yield curve will remain very flat, stuck close to 0%.

The United States will continue to have higher rates across the curve than most developed markets. In turn, this – combined with lower growth and stuckflation – will cap how high U.S. interest rates can go. In Europe, German interest rates are expected to remain near (or even below) zero across the curve. Countries with fundamental credit concerns (think Italy) will have higher rates than Germany, though likely still below those of the U.S. thanks to heavy ECB involvement. In this sense, Europe is looking ever more like Japan, whose yield curve will remain very flat, stuck close to zero. Yield curves in other major economies – including the United Kingdom, Canada and Australia – are expected to regain positive slopes.

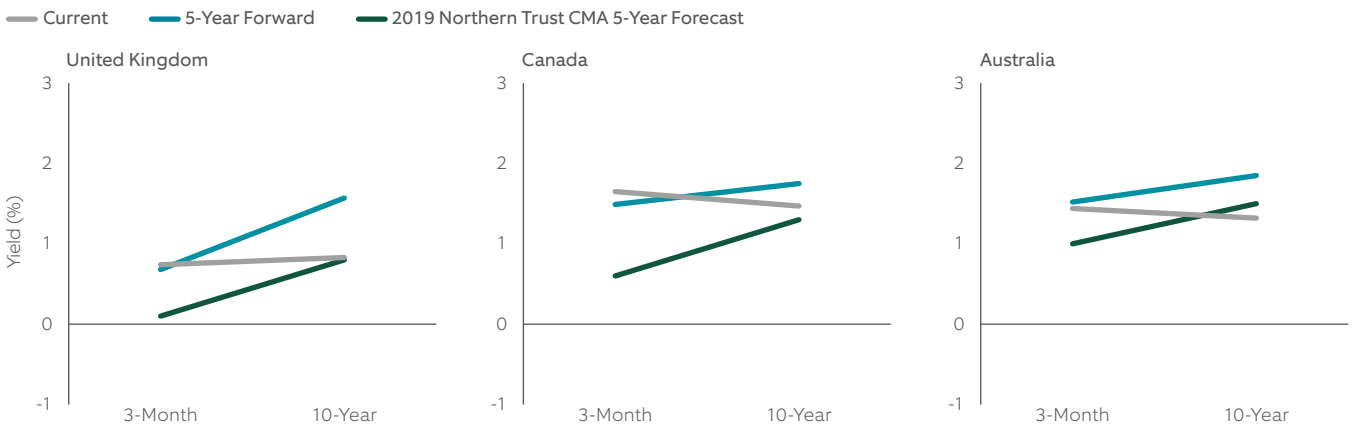
Cash Returns

The new global easing cycle will once again pressure cash returns, which will range from 1.1% in the United States to -0.3% in Europe. Between those two bookends, we expect Australia to provide a 0.8% return, Canada 0.7%, the United Kingdom 0.3% and Japan -0.1%. None of these returns are expected to outpace inflation (even despite low, stuckflation-driven inflation forecasts), leaving investors in a renewed search for yield.

EXHIBIT 14: CONTINUED LOW RATES BUT SLIGHTLY STEEPER CURVES

Mild growth and Stuckflation will keep interest rates low but yield curves should steepen.

Government Bond Yield Curves (3 Months To 10 Years)



Source: Northern Trust Global Asset Allocation, Bloomberg. Current and 5-year forward data as of 6/30/2019.

Longer-Duration Index Returns

Forecasting the returns for longer-duration fixed income indices 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. Exhibit 15 shows the historical average difference between starting point yields and annualized five-year returns. Investment grade asset classes have all shown higher total returns than starting point yields. Within emerging markets, hard currency debt (generally issued in U.S. dollars) has also shown a positive difference while local currency debt suffers some return degradation – as does global high yield (both discussed on the next page).

The "outperformance" of investment grade debt (vs. starting point yields) has historically been made possible by the combination of interest rates persistently undershooting market expectations (wherein positive sloping yield curves suggested higher interest rates in the future, which did not come to pass) and the index's evergreen structure (new bonds are continually being added to the index as old bonds mature, thus "resetting" the index at higher overall yields). This phenomenon has been fairly constant throughout history – except in the late 1970s, when interest rates moved materially higher the following five years.

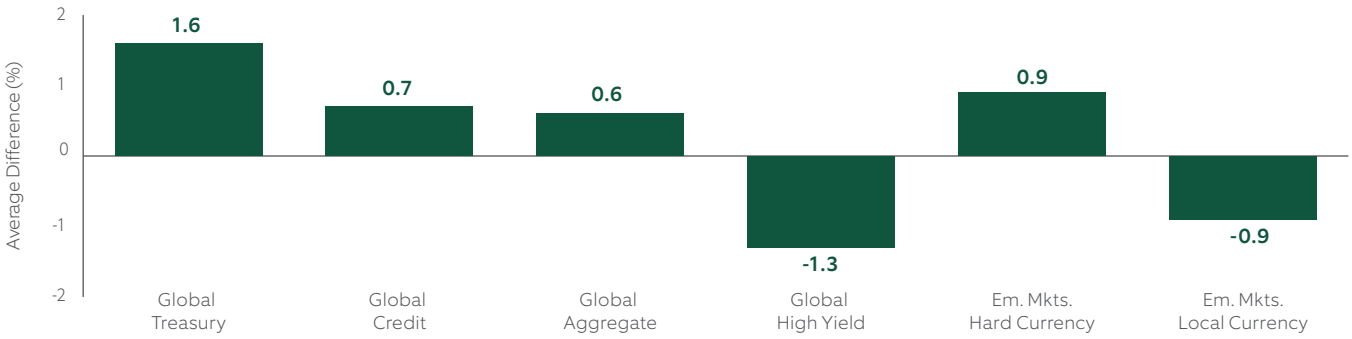
Because we expect interest rates to remain below what is priced into forward curves, we anticipate total returns will continue to outpace starting point yields. Specifically, for the global aggregate index, we expect the 1.5% starting point yield will translate into a 2.1% annualized total return. A similar dynamic is at play for our regional fixed income forecasts (see Exhibit 16). To reiterate (because it is important), yields falling more than what is priced in will result in total returns that are above starting point yields – even in a flat yield curve environment.

Because we expect interest rates to remain below what is priced into forward curves, we anticipate total returns will continue to outpace starting point yields.

EXHIBIT 15: HOW A YIELD BECOMES A RETURN

Total returns differ from starting point yields (yield-to-worst) due to term structure and credit impacts.

Average 5-Year Annualized Rolling Return Less Starting Point Yields



Source: Northern Trust Global Asset Allocation, Bloomberg. Average return difference between 5-year return and starting yield measured through 3/31/2019. Treasury and credit data begins 9/30/2000. Aggregate and high yield data begins 1/31/1990. Hard currency begins 1/31/2000. Local currency begins 12/31/2002. Yield-to-worst (YTW) is the lowest potential yield that can be received on a bond without the issuer actually defaulting. Indices used from left to right on chart are Bloomberg Barclays Indices (BBG): BBG Global Agg Treasuries Total Return Index (unhedged), BBG Global Agg Credit Total Return Index (unhedged), BBG Global Aggregate Total Return Index (unhedged), BBG Global High Yield Total Return Index (unhedged), JP Morgan EMBI Global Diversified Composite, JP Morgan GBI-EM Global Diversified Composite (Unhedged). Investors cannot invest directly in an index.

High Yield Returns

Credit impacts on total return are most noticeable within high yield. Per Exhibit 15, global high yield's credit element (think defaults) leads to five-year annualized returns below starting point yields – historically representing a 1.3% hit. We are expecting a similar hit over the next five years, with the current 5.8% yield translating to a 4.8% return expectation. Lower interest rates will both drive the ongoing search for yield and support asset class fundamentals (lower interest rates equate to an easier ability to service and roll over debt).

Lower interest rates will both drive the ongoing search for yield and support asset class fundamentals.

Emerging Market Debt Returns

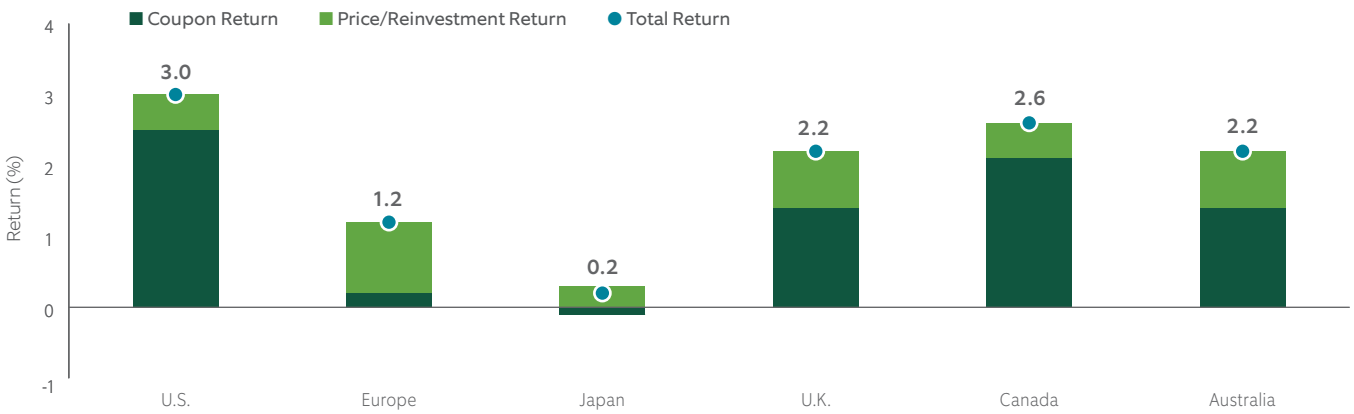
Emerging market debt – both hard and local – can complement global high yield in a well-diversified portfolio. The path of the U.S. dollar heavily influences emerging market debt performance – especially local currency. As such, the decision on whether to incorporate emerging market debt into the high yield portion of the investment portfolio is driven by shorter-term currency views.

U.S. Municipal Returns

Bifurcation will be a notable theme in the municipal credit market. The vast majority of municipal issuers will show stability over the next five years. But the headlines will capture the smaller set of issuers with crushing pension liabilities, poor fiscal oversight, demographic shifts and limited tax raising capacity. Overall, low-but-positive returns (still above taxable options on an after-tax basis) will be available for skilled investors. Demand for tax-exempt income will remain high, particularly in states most impacted by state and local tax deduction limits, while supply will continue to be constrained by issuer expense pressure in the low growth economy. Green projects (irrespective of "green bond" label) will be the primary driver of issuance growth.

EXHIBIT 16: FIXED INCOME RETURN BUILDING BLOCKS

Low fixed income return forecasts are due to low yield starting points.



Source: Northern Trust Global Asset Allocation, Bloomberg. Coupon return calculated as yield-to-worst on 6/30/2019.

EQUITIES

Our equity forecasting process begins with a quantitative analysis of which 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 41% of next-five-year total return variability and 85% of next-10-year total return variability. Given current above-average valuations (8.7% cash flow yield vs. the 12.4% long-term average), the model predicts a five-year annualized total return of 3.9% – notably lower than the long-term historical average of 7.9% (data back to 1900).

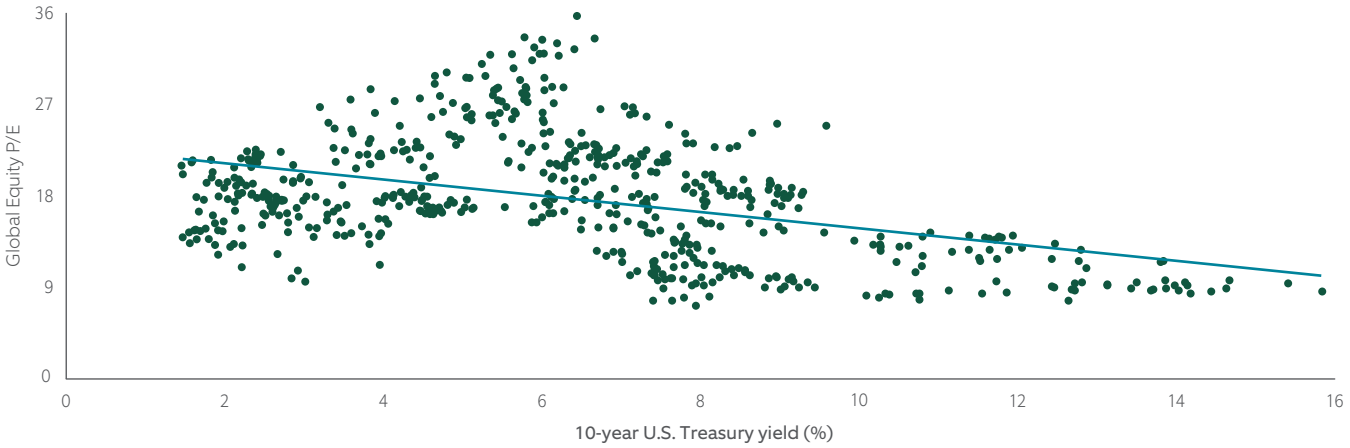
Of all the factors we follow, valuations – specifically cash flow yields – have proven to be the best predictor of future returns.

However, the quantitative starting point described above does not take into account the prevailing interest rate environment. As seen in Exhibit 17, there is an observable relationship between interest rates (proxied by the 10-year U.S. Treasury yield) and global equity valuations (here using price-to-earnings ratios). In general, lower interest rates equate to higher equity valuations. We analyze this relationship another way in Exhibit 18, where we look at the median valuation of the global equity market and the median "valuation" of the 10-year U.S. Treasury (the inverse of the 10-year yield) by decade. The median valuation this decade is certainly elevated vs. those found in the 1970s and 1980s – but interest rates are much lower today. The price-to-earnings ratio of 18.3 (as of 6/30/2019) may look stretched vs. history, but looks inexpensive against the current 50 "valuation multiple" on the 10-year U.S. Treasury. We come back to this in our equity forecast building block discussion.

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 0.86 correlation to developed market equities with a 1.22 beta and a 3.1% annualized return

EXHIBIT 17: OPPORTUNITY COST

A major driver of equity valuations is the yield the investor can get on other investments.



Source: Northern Trust Global Asset Allocation, MSCI, Bloomberg. Data from 1/30/1970 through 6/30/2019. Global equities are proxied by MSCI World.

premium. But this return premium has not been constant. For instance, emerging markets have underperformed developed markets by 2.3% annually over the past five years. Whether or not the "emerging market return premium" will be earned over the next five years – and, if so, to what extent – is also covered in detail in our equity forecast building block discussion.

Emerging markets have underperformed developed markets by 2.3% annually over the past five years.

The Building Blocks of Our Forecasts

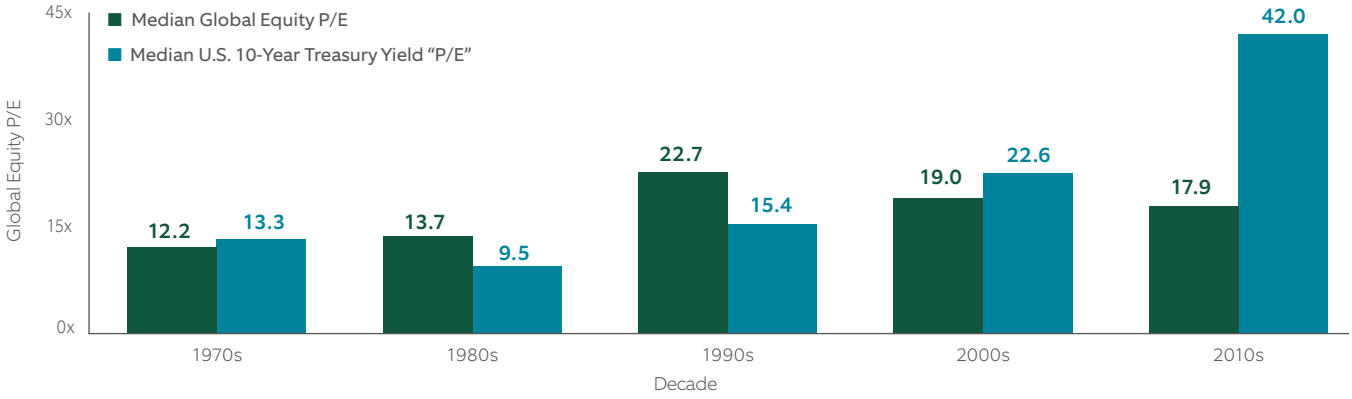
This historically based quantitative analysis is subject to our forward-looking thematic views, applied through a building-block approach to equity forecasting that involves four primary components:

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. Per Exhibit 19, expected growth of companies within a region can differ from the growth in the economic region itself.
2. **Profit translation:** Profit translation represents companies' ability to turn revenue into per-share earnings and 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 forecast valuation impact using expected changes in price-to-earnings ratios. This allows us to maintain consistency with our earnings forecast.
4. **Dividend yield:** We use current dividend yields as our initial forecasts, only deviating if our forward-looking views lead us to expect that companies will return more or less cash to shareholders via dividend payments.

EXHIBIT 18: RELATIVELY VALUED

Equity valuations have moved into a new, higher regime as a result of low interest rates.

Equity Valuations By Decade Vs. Bond "Valuations"



Source: Northern Trust Global Asset Allocation, MSCI, Bloomberg. Data from 1/30/1970 through 6/30/2019. Global equities are proxied by MSCI World. 10-year U.S. Treasury "P/E" is the inverse of the yield.

The following table 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 (%)	3.8	6.5	4.2
Profit Translation (%Δ)	-0.4	-3.3	-0.8
Valuations (%Δ)	-0.4	0.0	-0.3
Dividend Yield (%)	2.6	2.8	2.6
Total Return (%)	5.7	6.1	5.8

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.

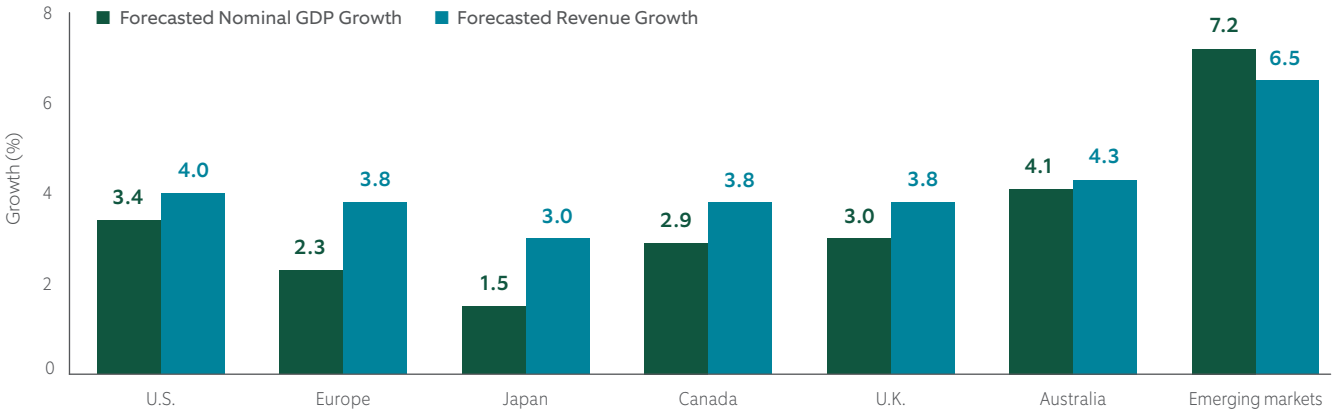
We expect developed markets to return 5.7% annually. Slow revenue growth – consistent with our *Global Growth Restructuring* theme – will be further pressured by some negative profit translation. Share repurchases will remain elevated but will be unable to offset lower profit margins, wherein cost increases – albeit muted – will eat into profits in a low top-line growth environment. We assume some of the valuation contraction that is often found in the late stages of economic expansion. Yet, given our expectation for continued low interest rates, we view this as a "cyclical" valuation contraction within a higher structural range. Indeed, we acknowledge the risk that valuations could actually go higher.

Our expectation for emerging market equity returns of 6.1% is a material reduction from last year's forecast, and represents a mere 0.4% return premium to developed markets. Thematically, we expect *Global Growth Restructuring* and *Irreconcilable Differences* to negatively impact the region's return potential. Still-superior revenue growth will be muted by continued (and well-documented) share issuance. Valuations, while inexpensive, are not expected to move higher given greater uncertainties surrounding current economic models – particularly China's.

Our expectation for emerging market equity returns of 6.1% is a material reduction from last year's forecast, and represents a mere 0.4% return premium to developed markets.

EXHIBIT 19: INVESTING IN COMPANIES NOT COUNTRIES

Global corporate footprints mean revenue growth differs from domestic economic growth.



Source: Northern Trust Global Asset Allocation, Factset. Revenue growth estimates as of 5/31/2019 and based on underlying MSCI equity indices.

Looking at Factors

Segmenting global equity markets by geography can be complemented by a factor-based approach, which involves 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), low volatility and dividend yield. Other factors, such as quality, are being researched, but definitions vary. 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 than low-quality stocks and, over time, outperform 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.). That said, we've included some high-level input from our quantitative strategy team:

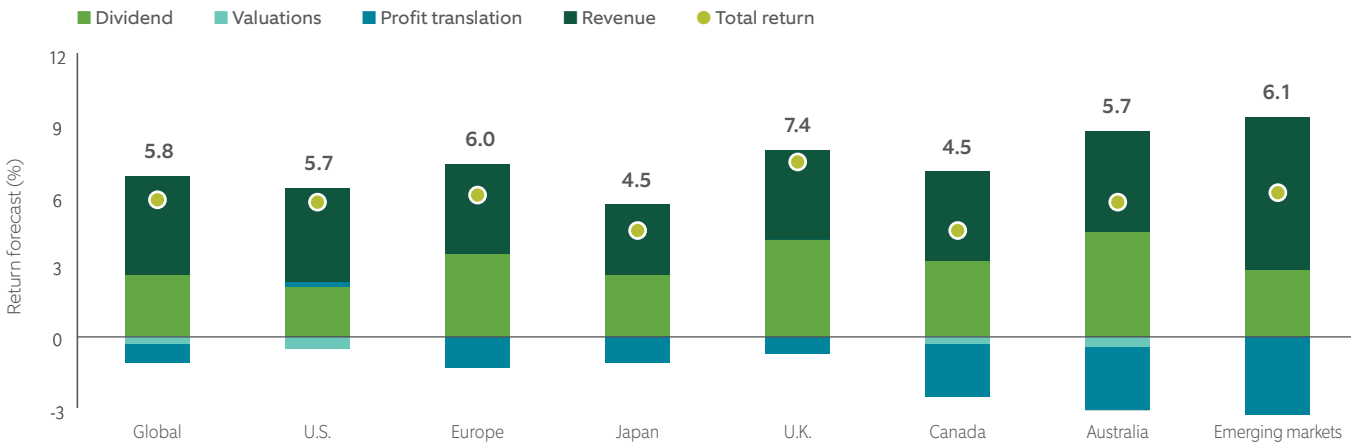
When analyzing relative factor valuations on a price-to-book basis (relative to history), value continues to stand out as attractively priced. However, we acknowledge that the value factor has been inexpensive for some time now – and it is difficult to predict when factors will start to "work" again. Value has one of the longest cycles of any factor – and those invested in value strategies should have the ability and wherewithal to withstand cyclical underperformance.

Not all risk factors take on higher risk to earn their return premium. For instance, strategies targeting the low volatility factor display just two-thirds of the volatility of the broader index. Yet, low volatility still earns a return premium by virtue of its asymmetric return profile (greater upside exposure than downside exposure).

Those invested in value strategies should have the ability and wherewithal to withstand cyclical underperformance.

EXHIBIT 20: EQUITY BUILDING BLOCKS

Slowing earnings growth and some valuation and margin pressures lead to subdued returns.



Source: Northern Trust Global Asset Allocation.

REAL ASSETS

The industry term "real assets" is a bit clumsy. Our primary asset classes – global natural resources, real estate and listed infrastructure – are equity-based and, therefore, aren't technically real assets. But they do provide real benefits to the portfolio, including diversified risk exposures and inflation mitigation.

We start our real asset forecast process with a review of historical relationships in order to identify risk exposures. Because our real assets are equity-based, they all have statistically significant market exposure. But other factors are also present, as outlined in Exhibit 21. The numbers denote the return accrued to the asset class for every 1% move in the factor. For instance, on average and all else equal, global real estate captures 0.91% of every 1% earned by the term factor.

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. Forecasts are listed below, along with the contribution from each factor and any qualitative adjustment. For instance, the 6.3% global real estate forecast comprises contributions from global equity (market), interest rate (term) and credit risk exposures of 3.5%, 0.8% and 1.5%, respectively – along with the 1.1% cash return and a qualitative adjustment of -0.5%.

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

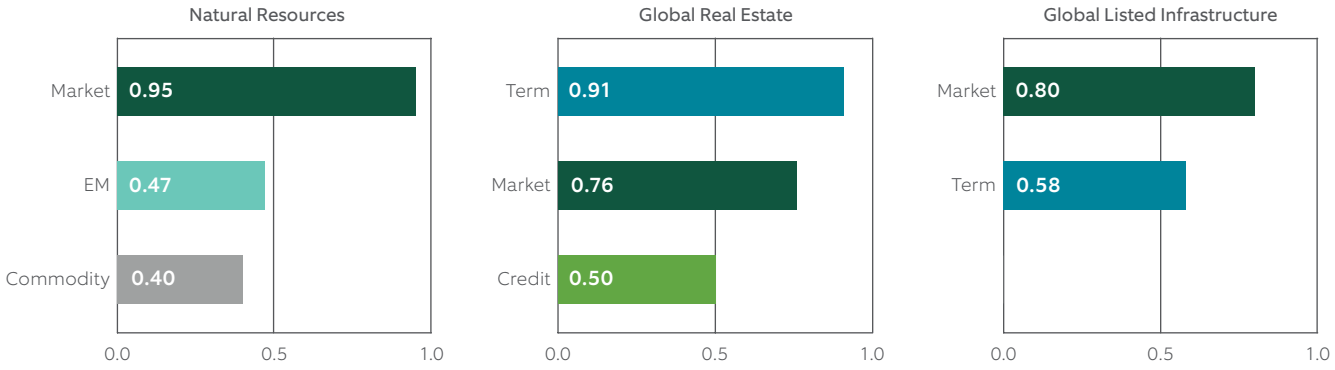
Contribution (%)	Natural Resources	Real Estate	Listed Infrastructure
Cash Return	1.1	1.1	1.1
Market	4.4	3.5	3.7
Term	-	0.8	0.5
Credit	-	1.5	-
Emerging Market	0.2	-	-
Commodity	0.9	-	-
Adjustment	-0.5	-0.5	0.5
Total Return (%)	6.1	6.3	5.8

Components may not exactly equal total return due to compounding.

EXHIBIT 21: WHAT EXACTLY AM I BUYING?

Real assets have a variety of different risk exposures that must be understood.

Real Asset Factor Beta



Source: Northern Trust Global Asset Allocation, Bloomberg. Regressions calculating factor exposure (beta) run from 12/31/2002 to 3/31/2019.

Natural Resources

Our use of an equity-based approach to natural resources is driven by its persistent outperformance of a futures-based approach (see Exhibit 22). Driving this outperformance is its equity market exposure, but commodity prices still play a large role in the return expectation. Slower global growth, the move away from fossil fuels and potential regulatory headaches have prompted us to qualitatively reduce our forecast by 0.5%, leading to an expected 6.1% return. But the asset class should still reduce the impacts of unexpected inflation.

Global Real Estate

Term and credit risk exposures provide continued support for global real estate as central bankers engage in a new easing cycle. Fundamentals are mixed and continue to be pressured by the decline in retail stores. But these are issues we have flagged for some time. Our 6.3% forecast continues to include a -0.5% qualitative adjustment, but we recognize the potential upside for an asset class that is transitioning to new growth opportunities (away from retail and toward new uses for legacy properties) and providing attractive yields.

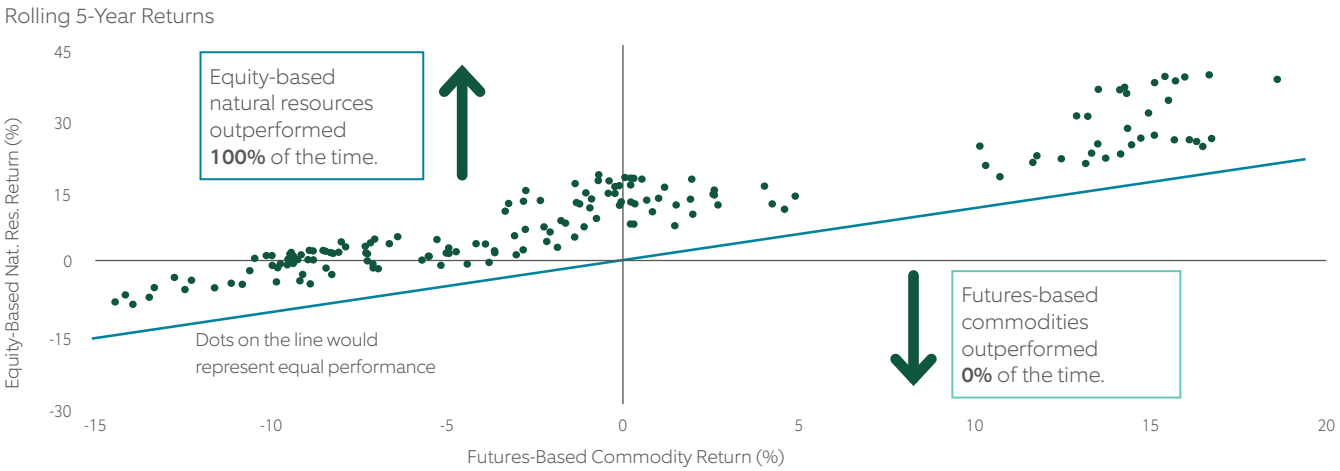
Global Listed Infrastructure

Term exposure will provide support and investors may view the asset class as a purer bond proxy than global real estate, without the fundamental challenges. Our *Staking Out Climate Risk* theme may open a new set of opportunities for infrastructure companies, especially as cash-strapped governments rely more on the private sector to invest in (and get paid for) necessary infrastructure improvements to combat climate change. Our 5.8% forecast includes a 0.5% qualitative adjustment to capture these potential opportunities and the potential return benefits from the renewed search for yield.

Term and credit risk exposures provide continued support for global real estate as central bankers engage in a new easing cycle.

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 6/30/2019. Morningstar Global Upstream Natural Resources Index represents equity-based natural resources while Bloomberg Commodity Index represents futures-based commodities. Past performance does not guarantee future results.

ALTERNATIVES

We define alternative investments as asset classes that aim to enhance risk-adjusted portfolio returns by introducing nontraditional risks. We focus on two primary asset classes in this space – private investments and hedge funds.

Private Investments

Forecasting private investment returns is made difficult by the absence of public pricing, which inhibits quantitative analysis. But it is intuitive to expect higher returns compared to public markets to compensate for illiquidity risk. Academic research suggests a historic private equity illiquidity premium of 2.5% (this also includes realized alpha generation). Practicing conservatism, we haircut this historically realized return premium by 0.5% to 2.0% and apply it across most public market risk assets to arrive at our respective private investment forecasts. For instance, our 7.7% private equity return forecast represents a 2% premium to our 5.7% public equity forecast, while our private natural resources return forecast of 8.1% represents a 2% premium to our 6.1% public natural resources forecast. To obtain our 5.8% private credit forecast, we apply a smaller 1% premium to our 4.8% global high yield return expectation.

This simplified approach to private investment forecasting is necessitated by the wide dispersion of private investment returns. To that end, the 2% return premium (1% in private credit) can be interpreted as the extra return we demand of the underlying strategies in exchange for taking on illiquidity risk. Historical data suggests that one way to capture a higher private market return is to allocate to smaller managers targeting smaller deal sizes. Over the past 20 years, the median manager below $1.5 billion generated a 2.3% greater return than the median manager above $5 billion (see Exhibit 23). That said, dispersion across all managers is still high, pointing to the necessity of a robust selection process.

Over the past 20 years, the median manager below $1.5 billion generated a 2.3% greater return than the median manager above $5 billion.

EXHIBIT 23: SIZE IS A FACTOR IN PRIVATE MARKETS TOO

While dispersion reigns, managers targeting smaller deals have outperformed.

Source: Northern Trust Global Asset Allocation, Preqin. Returns are measured from 12/31/1999 thorugh 6/30/2019. Past performance does not guarantee future results.

Hedge Funds

The primary benefit of hedge fund strategies is the ability to provide nontraditional and uncorrelated return premiums to the traditional portfolio, by producing alpha – returns not explained by risk exposures. Our 3.7% hedge fund return forecast represents the combination of expected alpha (0.5%) and expected returns from risk exposures (3.2%). Our forecast is based on our risk factor model, which includes the following risk factors: market, term, credit, size, value, momentum, emerging market, commodity and currency. We add an additional market factor, which we lag by one month to capture any accounting issues that might delay asset price "marks."

Exhibit 24 shows rolling 10-year hedge fund returns (as proxied by the HFRI Fund-Weighted Index) split between the risk and alpha contribution – all based on the model described above. The hedge fund risk contribution, while showing some cyclicality, has been fairly steady over time and has largely tracked a balanced portfolio (though has fallen behind more recently). This makes sense; hedge funds in aggregate are really just one large multi-asset-class portfolio, with notable exposure to global equities (market risk).

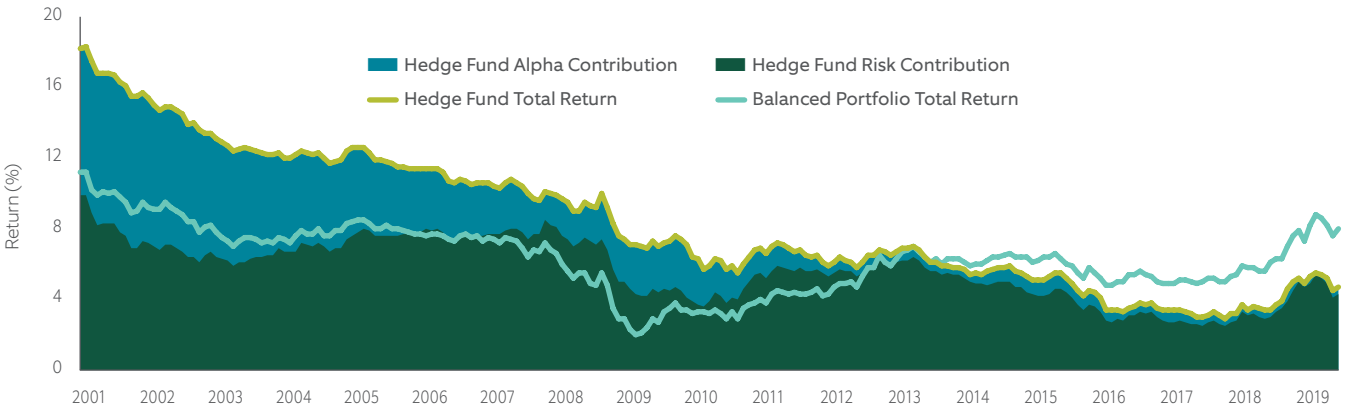
However, alpha generation has been steadily deteriorating over time – from an annualized 8.2% in the 10-year period ending 12/31/2000, to an annualized 0.5% over the past 10 years. We use this trailing 10-year number as our alpha forecast for the next five years. Similar to our private investment forecasting, this 0.5% figure effectively becomes the risk-adjusted excess return (after fees) we demand from hedge fund strategies. Also in-line with private investments, we recognize that individual strategies will vary around the average alpha driven by manager skill – and a robust selection process can assist in finding top strategies.

We recognize that individual strategies will vary around the average alpha driven by manager skill – and a robust selection process can assist in finding top strategies.

EXHIBIT 24: INCREASING RISK RELIANCE

The average hedge fund alpha has slipped over time, but varies significantly by manager.

Hedge Fund vs. Balanced Portfolio – 10-Year Rolling Returns



Source: Northern Trust Global Asset Allocation, Northern Trust Portfolio Construction Desk, Bloomberg. Data from 12/31/2000 to 3/30/2019. Balanced portfolio is 50% MSCI ACWI / 50% Bloomberg Barclays Global Aggregate Index. 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	2019	2018	2017	2016	2015	2014	
Fixed Income	United States	Cash	3-Month U.S. T-Bill	1.1	2.2	1.7	0.5	1.5	0.9	0.9
		Inflation Linked	BBG BarCap U.S. TIPS	2.6	2.9	3.0	2.5	2.5	3.0	1.8
		Investment Grade	BBG BarCap U.S. Aggregate	3.0	3.6	3.2	3.0	3.0	3.0	2.9
		High Yield	BBG BarCap U.S. High Yield	5.0	4.9	4.8	5.3	5.6	5.6	4.7
		Municipal	BBG BarCap Municipal	2.4	3.2	3.2	2.8	3.5	4.0	3.6
	Europe	Cash	3-Month German Bunds	-0.3	-0.3	-0.2	-0.5	0.0	0.4	-0.6
		Inflation Linked	BBG BarCap Euro Inflation Linked	1.0	1.2	1.5	1.4	1.8	2.8	2.6
		Investment Grade	BBG BarCap Euro Aggregate	1.2	1.8	1.5	1.4	2.0	2.8	3.1
	Japan	Cash	3-Month JGB	-0.1	0.0	-0.1	-0.3	0.0	0.1	-0.1
		Inflation Linked	BBG BarCap Inflation Linked JGB	0.2	0.5	0.8	0.8	1.2	1.5	-0.7
		Investment Grade	BBG BarCap Japanese Aggregate	0.2	0.5	0.7	0.5	1.0	1.2	2.3
	U.K.	Cash	3-Month Gilts	0.3	0.9	0.5	0.3	1.5	1.3	0.5
		Inflation Linked	BBG BarCap Inflation Linked Gilt	2.2	1.7	1.6	2.0	2.6	3.0	9.3
		Investment Grade	BBG BarCap Sterling Aggregate	2.2	2.5	2.5	2.6	3.0	3.7	5.7
	Canada	Cash	3-Month Canada T-Bill	0.7	1.6	1.3	0.7	1.5	1.3	1.0
		Inflation Linked	FTSE Canada Real Return Bond	2.0	2.3	2.5	2.5	2.5	3.2	3.4
		Investment Grade	FTSE Canada Universe	2.6	2.9	2.5	2.6	2.7	3.4	3.9
		High Yield	BofAML Canadian High Yield	4.5	4.5	4.5	5.0	5.6	5.6	5.4
	Aus.	Cash	3-Month Australia Gov't Bond	0.8	2.5	2.4	2.0	2.2	2.8	2.0
		Investment Grade	BBG BarCap Australian Composite	2.2	3.5	3.2	3.3	3.5	4.0	5.5
	Global	Investment Grade	BBG BarCap Global Aggregate	2.1	2.7	2.2	2.1	2.5	2.7	3.8
		High Yield	BBG BarCap Global High Yield	4.8	4.6	4.5	5.3	5.8	5.8	5.2
		Emerging Market Debt	JP Morgan GBI-EM Diversified	5.0	5.8	5.3	5.5	6.5	6.0	6.9
Equities	Developed Markets	United States	MSCI United States	5.7	5.8	5.9	4.8	5.6	6.6	10.6
		Europe	MSCI Europe ex U.K.	6.0	6.3	7.2	5.3	6.8	8.2	6.4
		Japan	MSCI Japan	4.5	6.0	6.0	5.6	6.2	6.6	6.1
		United Kingdom	MSCI United Kingdom	7.4	6.3	6.6	5.9	7.0	8.6	5.8
		Canada	MSCI Canada	4.5	5.5	6.0	6.0	6.9	7.1	4.9
		Australia	MSCI Australia	5.7	7.7	7.7	8.0	8.1	9.1	8.8
		Developed Markets	MSCI World	5.7	6.0	6.4	5.4	6.1	7.2	8.8
	Emerg. Markets	Asia	MSCI EM Asia	5.5	8.8	8.9	8.0	8.5	10.0	6.4
		Latin America	MSCI EM Latin America	8.9	6.5	6.9	5.6	5.7	7.0	9.2
		EMEA	MSCI EM EMEA	6.9	7.5	7.3	6.0	6.5	7.9	6.1
		Emerging Markets	MSCI Emerging Markets	6.1	8.3	8.4	7.3	7.8	9.0	6.5
	Global	Global Equities	MSCI All Country World	5.8	6.2	6.9	5.8	6.5	7.4	8.6
Real		Natural Resources	S&P Global Natural Resources	6.1	7.2	7.4	6.9	7.0	7.0	0.7
		Listed Real Estate	MSCI ACWI IMI Core Real Estate	6.3	6.0	6.1	6.3	6.9	8.0	6.4
		Listed Infrastructure	S&P Global Infrastructure	5.8	5.4	5.8	5.6	6.2	7.0	4.8
Alts		Private Equity	Cambridge Global Private Equity	7.7	8.0	8.4	7.4	8.6	9.2	N/A
		Hedge Funds	HFRI Fund Weighted Comp	3.7	4.3	4.4	3.4	4.4	4.3	2.9

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 6/30/2019.

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.

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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, 2019, Northern Trust Corporation had:

- $11.3 trillion in assets under custody/administration
- $8.5 trillion in assets under custody
- $1.2 trillion in assets under management
- $125 billion in banking assets

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