MEKETA
INVESTMENT GROUP

Today's Low Interest Rate Environment—Zero Bound and Down

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Why are interest rates so low today?

Are low rates driven by cyclical or secular forces?

What are the implications of low rates for investors?

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To combat the effects of the Global Financial Crisis (GFC) of 2007-2009, central banks around the world aggressively lowered interest rates and ultimately engaged in non-traditional policies such as quantitative easing and negative deposit rates to encourage investment and growth. Ten years after the GFC, interest rates remain well below historical norms, with large portions of some countries' yield curves in negative territory. In this paper, we will discuss the current environment, how we got here, and what implications "lower for longer" might have on return assumptions, asset allocation, and overall economic activity.

The current state of rates

On October 30, 2019, the Federal Reserve reduced the federal funds rate by 0.25%, following similar cuts in July and September. This latest rate cut comes on the heels of the European Central Bank's (ECB) September 12, 2019 stimulus efforts that reduced their effective policy rate to -0.5%, and restarted a bond-buying program (i.e., quantitative easing) that entails purchasing 20 billion euros per month of assets for as long as it deems necessary. Similarly, at its recent meeting, the Bank of Japan (BOJ) maintained its short-term interest rate target at -0.1% and its pledge to guide 10-year government bond yields to around 0% through its own bond-buying program. All of these steps are efforts by central bankers to revive a slowing of the global economy.

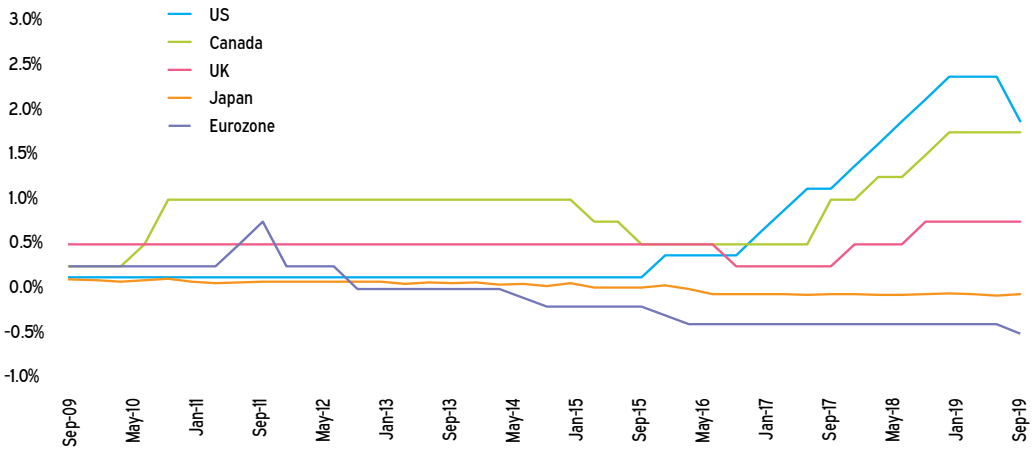


FIGURE 1
Central Bank Interest Rates

Source: Bloomberg.

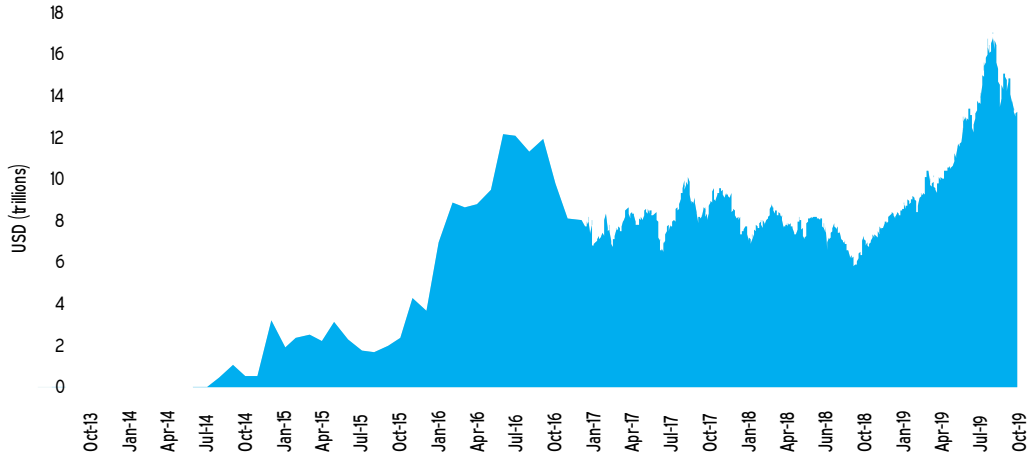


FIGURE 2
Negative-Yielding Bonds

Source: Bloomberg.

Europe looks poised to deliver roughly zero growth for the remainder of 2019, as its most durable growth engine, Germany, appears to be stalling and entering a recession in the third quarter. While U.S. economic growth has been significantly better, at 1.9% in the third quarter, the rate of growth has declined by more than a percent year over year and, if leading indicators prove prescient, growth will likely continue to slow before stabilizing. The question that keeps central bankers, market participants, and business leaders awake at night is whether these latest moves will have the desired effect of forestalling a global slowdown and reinvigorating growth.

Historically, monetary policy has been a potent means to reduce the severity of business cycle downturns and an efficient tool in bolstering economic activity. However, many central banks have been forced to implement nontraditional policy measures since the GFC. Market participants, academics, and some central bankers themselves are starting to wonder if we have moved into an era in which monetary policy does not have the same impact as it used to on the economy.

To be certain, we have definitely entered an Alice in Wonderland-esque interest rate environment. As illustrated above (Figure 2), we have recently seen over $17 trillion, more than a quarter of the entire sovereign debt market, trading at negative yields. Some countries, such as Germany, have even seen their entire yield curve turn negative. That means that some investors are willing to lend their money for 30 years and guarantee a negative rate of return over that period. In Denmark, borrowers are able to take out mortgages with negative interest rates wherein the bank effectively pays the borrower to take out a home loan. Perhaps the most surprising situation in this new interest rate world is the fact that tens of billions of dollars of "high-yield" (i.e., below investment grade) debt now trades at negative interest rates.

The long-term nature of interest rate cycles

It is useful to put today's interest rate environment into historical context (Figure 3), in order to see the magnitude of its extremity. Over the past roughly 65 years, U.S. interest rates have gone through a full cycle characterized by steadily rising rates from the early 1950s until rates peaked in the early 1980s, and then steadily declining over the past thirty-five years.

Over time, the Federal Funds rate has largely moved with 10-Year Treasury rates, as the Fed adjusts monetary policy in accordance with the business cycle. Taking a longer-term perspective helps show that over several business and economic cycles, interest rates have experienced a much larger cycle (which some have termed a "super-cycle").

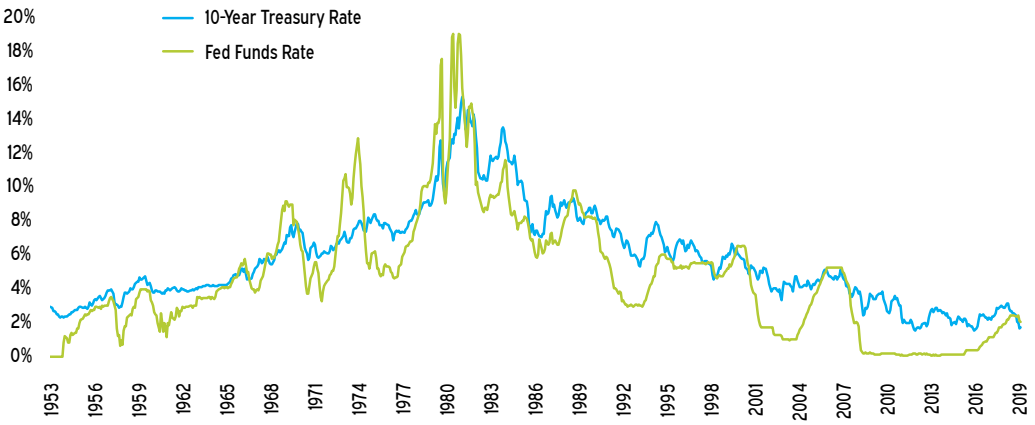


FIGURE 3
US Historical Interest Rates
April 1953-September 2019

Source: FRED

Why are rates so low today?

In order to stop the economic hemorrhaging of the global economy during the GFC, major central banks aggressively lowered short-term interest rates and started purchasing bonds from banks in order to push down longer-term rates, (i.e., quantitative easing). The idea was to stimulate borrowing from lowering rates and at the same time infuse banks with cash to lend through quantitative easing. Although these efforts largely stabilized the global economy, and arguably prevented a depression in the U.S., they did not completely have the intended effect. Banks largely did not lend the money, but instead kept it at the Federal Reserve, and corporations focused on share buybacks instead of business investment. Sticking to the theory that lowering interest rates would spur economic growth, central bankers took monetary policy to extremes, in many cases dropping interest rates to zero or even negative. Arguably, these incremental efforts have not stimulated economic activity, but instead further reinforced the expectations for low rates and fanned asset prices even higher.

As previously stated, current monetary theory asserts that by lowering interest rates central banks can spur economic activity primarily through reducing borrowing costs. The goal of reducing borrowing costs are two-fold:

→ to create incentives for capital investment by businesses and;
→ to create incentives for consumers to spend.

A related potential benefit - and risk - that may arise from lower rates and economic growth is the wealth effect: the phenomenon where individuals consume (spend) more as their wealth increases. The means by which the wealth effect is transmitted from monetary policy to the greater economy is through its effect on risk assets. Lower interest rates push up the value of risk assets through two transmission mechanisms:

→ the substitution effect and;
→ the discount rate effect.

The substitution effect holds that investors need to consider riskier and riskier investments in order to attain the same desired rate of return available prior to the decline in interest rates. For example, assume an investor needs to earn a 5% return on their investment. In a "normal" interest rate environment, that investor may be able to earn that 5% on a risk-free Treasury bill. As interest rates decline, the same investor may have to take on additional duration (i.e., interest rate) risk by purchasing longer-dated Treasury bonds or assume credit risk by purchasing a corporate bond to achieve the same 5% return objective. As interest rates continue to decline the investor must take on additional incremental risk (e.g., Treasuries to investment grade corporate bonds, to high yield bonds, to equities and so forth) in order to reach the same level of return. The discount rate effect, on the other hand, is the idea that the value of an investment is based on its ability to generate future cash flows, which are then discounted back to the present. As interest rates decline, those future cash flows become more valuable since they are discounted back to the present at a lower rate, thus, theoretically increasing the value of the investment.

In recent years, monetary policy measures had only a modest impact on the ultimate goal of sustained global economic growth despite the profound impacts of the transmission mechanisms. We will touch on why the impacts may have diminished relative to previous cycles later in the newsletter.

As we discussed in the introduction, global interest rates have been pushed to once unthinkably low levels, with much of Europe's and Japan's debt trading in negative territory. This seemingly irrational situation results in savers essentially paying borrowers for the right to lend them money. In practice, an investor in a negative yielding bond does not actually send the borrower interest but instead buys a bond with a low or zero interest rate for greater than 100 cents on the dollar. While buying a bond with a guaranteed loss, if held to maturity, may seem irrational, investors have been willing to do it given the perceived risk in other investments or because they are required to hold high quality assets. A positive return from these negative rate issues can still be earned though. For example, some investors will purchase these premium bonds betting that central banks will buy them later for a higher price as they conduct future quantitative easing programs. Other investors will hold these issues as a "safety" investment against potential risks that might include a global recession, a hard Brexit, trade wars, and numerous other geopolitical risks, all of which would likely lead to a "flight-to-safety" that should cause these bonds to appreciate in value.

Central banks achieve negative interest rates through two mechanisms:
→ by charging banks for maintaining reserves at the central bank, and;
→ by purchasing fixed income securities in the market.

By charging interest on bank reserves instead of paying interest (as the ECB currently does), central banks are trying to incentivize lending by penalizing banks for keeping money at the central bank rather than lending it. Purchasing securities on the open market gives the central bank the flexibility to target interest rates farther out on the yield curve. Through these purchases, the ECB and the BOJ now own approximately 30% and 40% of their respective governments' debt.

The following table highlights the global nature of the current low interest rate environment.

Country	2-Year Yield	5-Year Yield	10-Year Yield	30-Year Yield
United States	1.53	1.52	1.69	2.18
France	-0.63	-0.44	-0.10	0.70
Germany	-0.67	-0.63	-0.41	0.10
Italy	-0.22	0.31	0.92	2.02
Japan	-0.24	-0.27	-0.14	0.38
United Kingdom	0.61	0.63	0.83	1.13

TABLE 1
Government Bond Yields (%)
As of October 31, 2019

Source: Bloomberg.

Interestingly, the U.S., despite extremely low interest rates from a historic standpoint, offers compelling yields versus other developed countries. Many economists and market commentators have pointed to this relative attractiveness as one of the causes of the recent U.S. yield curve inversion. Given the ease of global capital mobility, foreign investors have been able to take advantage of the yield differentials between U.S. rates and the rates available in their home country. While these investors are exposed to interest rate and currency risks, they are able to trade up in quality and actually earn a higher yield. This buying, coupled with the natural flight-to-safety buying (due to fears of a global economic slowdown), has put pressure on all but the short end of the yield curve (which is under direct influence of the Federal Reserve), resulting in the inverted yield curve.

Are low rates cyclical or secular?

All of the prior discussion gives rise to an important question with far ranging potential impact: is the current low interest rate environment the lingering remnants of the GFC of a decade ago, or are we entering a new paradigm of secular low interest rates? The answer to this question has profound impacts on policy makers, governments, and investors. The key to determining if we are in a predominately cyclical or secular low interest rate environment depends on whether we are facing the headwinds naturally arising following years of expansion (along with lingering issues from the financial crisis) or whether structural changes in the global economy, mainly technological,

demographic, and societal, have brought us to an era of secular change. Some market commentators have come to describe this secular change thesis as the "Japanification" of the developed world economies. Japanification has entered the lexicon as a term to describe Japan's 30-year struggle with deflation and anemic economic growth in the face of extraordinary, but ultimately ineffective, monetary stimulus. Key to this hypothesis is that technological, demographic, and societal changes have led to a savings glut whereby the availability of capital far exceeds the need for it.

Technological changes, such as robotics and computing capacity, have led to efficiencies that reduce costs and ultimately require less outside capital. Demographic trends are toward an older population with longer life expectancies in many developed countries. This increases the need to save for an approaching and long retirement. Societal changes have altered both what we consume and how we interact in the global economy. These changes are evident when looking at the most valuable U.S. companies (Table 2): Microsoft, Apple, Amazon, Alphabet (Google), and Berkshire Hathaway. When you contrast these companies to the leading companies 20, 30, or 50 years ago, the difference is dramatic in what these companies produce, their need for capital, their returns on capital, and the means by which consumers engage with them.

As of September 30, 2019	Market Capitalization USD
Microsoft	1.06T
Apple	1.01T
Amazon	858.68B
Alphabet (Google)	845.94B
Berkshire Hathaway	509.73B

As of September 30, 1990	Market Capitalization USD
Exxon	61.11B
IBM	60.94B
General Electric	48.43B
Altria Group	41.83B
AT&T	33.62B

TABLE 2
Top 5 Largest Companies in the S&P 500

Source: Bloomberg.

It is also evident that their need for third party capital to maintain and grow production has declined dramatically from earlier periods. The other large societal change is that the world has grown significantly wealthier over the past few decades. Increased wealth leads to increased savings, which leads to increased loanable funds. Economics 101 tells us that as supply increases, prices fall, and since interest rates are just the price of money, higher quantities of savings puts natural downward pressure on interest rates.

These secular changes that are starting to take hold in much of the developed world have been present in Japan for some time, as it was the first large developed economy to be hit by these forces. To combat the stagnation that these secular trends brought about, Japan was the first major central bank to pursue a zero interest rate policy (ZIRP) and has been one of the largest purchasers of its own government debt. It has also pursued expansionary fiscal policies, though inconsistently at times. All these interventions have led to the Japanese central bank owning close to half of the outstanding supply of Japanese government debt (Figure 4), a debt to GDP ratio of over 225%, a 30-year battle with deflation, and poor long-term growth prospects.

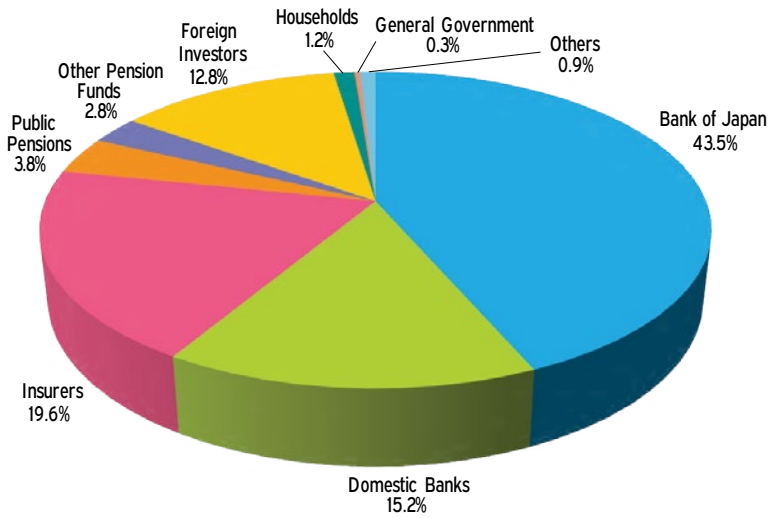


FIGURE 4
Japanese Debt Ownership

Source: Ministry of Finance, Japan

If the current low interest rate environment is predominately a secular phenomenon and we do face the Japanification of the developed world, then governments, central banks, and investors have a profoundly challenging future ahead. If, however, the current interest rate environment is predominantly a cyclical phenomenon, then it represents a difficult yet transitory situation. Arguments for the cyclical nature of the current low interest rate environment center around the idea that low interest rates are driven by an attempt by central bankers to forestall a slowing of the global economy after a prolonged period of weak but relatively consistent global growth. Giving credence to this view are the latest policy pivots from major central banks from a tightening to an easing bias as global growth has continued to slow. Compounding this cyclical slowdown are the trade wars between the U.S. and other counties, particularly China, which has weighed on global trade and put further pressure on the already slowing global economy.

Economists have also proposed several additional theories as to why rates remain so low that do not fit neatly into either the cyclical or secular thesis. First is the idea that the low rates simply reflect the prospect of diminished returns on capital. When real yields (nominal rates adjusted for inflation expectations) are low or negative, investors may not earn returns in real terms commensurate with the risk. In their book, "This Time is Different: Eight Centuries of Financial Folly", Reinhart and Rogoff show the impact of too much government debt and economic growth. For example, in the U.S., the real per capita GDP growth from 1800-1999 was approximately 1.8%. This same measure from 2000-2018 was 1.3%.

This drop in growth may be correlated with the explosion of government debt in the U.S., particularly since the GFC (Figure 5). Exploring all the potential factors trapping the world in a low growth and low interest rate environment (e.g., cyclical and secular changes, debt, decreases in productivity) are outside the scope of this newsletter but, in aggregate, they form a vicious circle in which low growth and interest rates beget further low growth and interest rates.

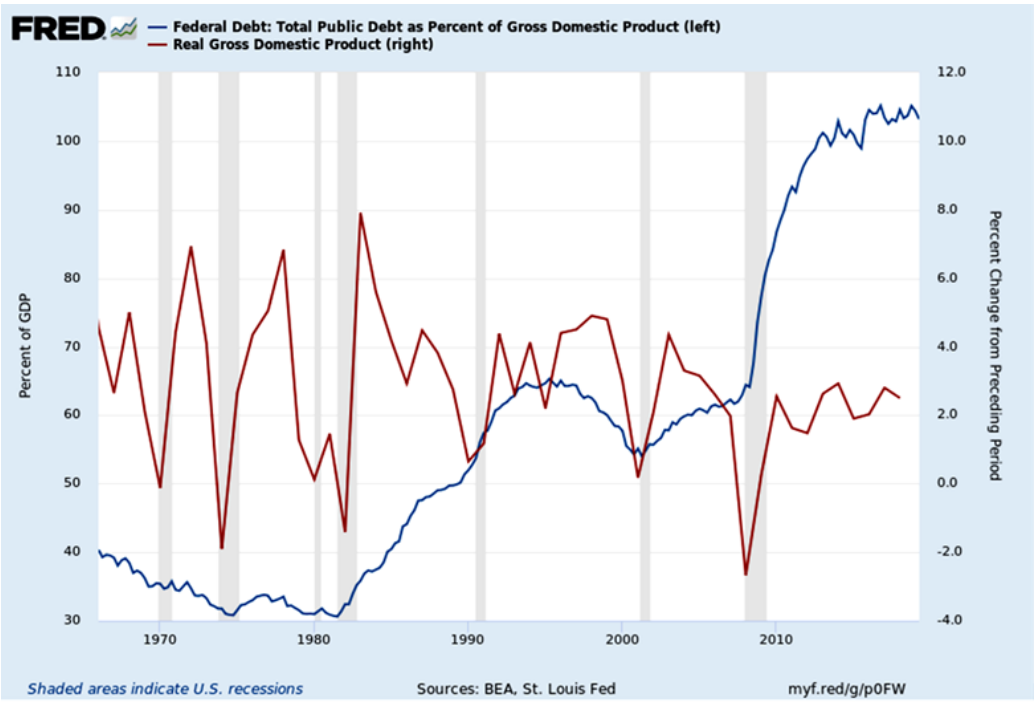


FIGURE 5
Federal Debt and Real GDP

Source: FRED.

Meketa Investment Group believes the current low rate environment is due to a combination of both cyclical and secular issues. In the U.S., we believe cyclical headwinds are a larger driver of current low interest rates than secular changes. These cyclical headwinds are temporary, by definition, and should abate over time. While the headwinds are daunting, we foresee an environment in which excess capital is deployed into growth-inducing projects such as infrastructure and technology investment, leading to future growth. Furthermore, the potential growth of emerging and frontier countries offers investors alternative avenues of investment and growth.

For countries with unfavorable demographics (such as Japan and much of Europe) and with policies that constrain the growth opportunities of the economy, the potential for interest rates to be mired in a secularly low range is high. Over the long-term, real GDP growth is composed of two factors: the growth in the labor force and increases in productivity (i.e., the growth in real output per worker). In (Figure 6) below, we see that in the U.S. real GDP growth has been declining relatively steadily each decade, save a brief blip in the productivity driven growth of the 1990s. Over this 50-year period, declines in the growth rate of labor have had the most dramatic impact on the overall decline in real GDP growth. The U.S. has better demographics than much of Europe and Japan though due to a higher birthrate and positive immigration. Because of this, the U.S. arguably has a higher real GDP growth potential, assuming similar productivity growth.

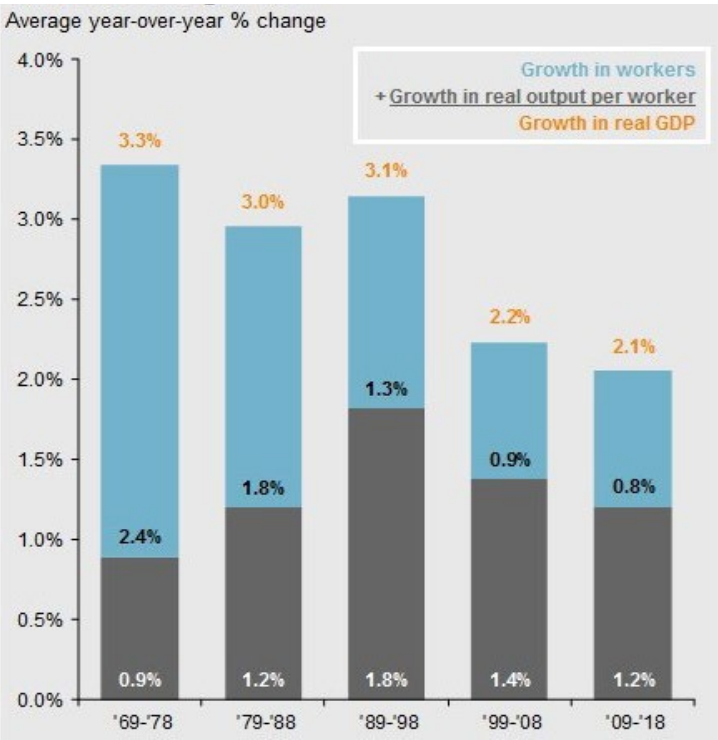


FIGURE 6
Drivers of GDP Growth

Source: JP Morgan. "Guide to the Markets"

In the short run, these forces are difficult to overcome but, over time, these countries may recognize the importance of expanding their working age demographics (through immigration, education, etc.) and the need to change policies that impede growth. Investment in growth projects like traditional infrastructure and 5G networks can help reinvigorate growth. Additionally, innovation and technology (e.g., AI, automation, autonomous driving) may be able to offset some of the demographic impacts on productivity and growth. Countries that have shown the ability to adapt, such as the U.S., are more likely to experience interest rate behavior that is more cyclical in nature. Ultimately, whether a country's rate structure is secular or cyclical will depend largely on that nation's willingness to invest in itself and adapt.

Regardless of whether the current low interest rate environment is predominantly a cyclical or secular phenomenon, there are increasing concerns that the results of ultra-low and negative interest rates, and the tools used to achieve them, are ineffectual and potentially harmful. The apparent ineffectiveness of recent monetary policy response, including QE, calls into question if central banks are pursuing practices that can actually propel investment and growth, or if they are relying on a playbook that is out of date with today's issues.

The liquidity trap

Paracelsus, the 16th century physician often credited as the father of toxicology, established the adage that "the dose makes the poison". He observed that all chemicals and molecules, even the ones required for life, such as oxygen and water, can be harmful or even lethal at sufficiently high doses. Some would argue the effects of monetary policy follow the same natural law. To a person suffering from dehydration, water is lifesaving. Similarly, an economy starved of liquidity desperately needs accommodative monetary policy. Yet, if a person is already well–hydrated, drinking additional water has less of a positive health benefit and can potentially become dangerous in excess. Similarly, many economists are coming to a parallel conclusion as it relates to accommodative monetary policy and the associated low interest rates. What was once vital to the survival of the system may now be ineffective and potentially harmful.

The potential ineffectiveness of ultra-low and negative interest rates to spur economic activity is encompassed in an idea known as a "liquidity trap", first proposed by economist John Maynard Keynes and his writings on the liquidity preference of savers.

While economists continue to debate the technicalities of a liquidity trap, a functional summation is that once interest rates approach the zero bound they become increasingly less effective at boosting economic growth, as savers prefer to hoard cash and financial assets rather than increasing aggregate demand through consumption and hard asset investment. As discussed previously, when real yields are zero or negative, investors may not earn returns high enough to justify the risk taken and therefore choose not to invest. Additionally, investors may view continued central bank actions as ineffective and choose to hold cash as they see potential negative economic events on the horizon. Put simply, at a certain lower bound, monetary policy becomes ineffective. This represents the so-called "pushing on a string" effect, wherein the transmission mechanism of monetary policy becomes so inefficient that central bankers have to take increasingly dramatic action to get a result, if any at all.

Giving credence to the idea of a liquidity trap, or more generally, the ineffectiveness of ultra-low and negative interest rates' ability to generate robust economic growth, is the so-far lackluster growth exhibited by countries that have implemented it (e.g., Japan and Europe). Despite a lack of long-term evidence, central bankers and academics in aggregate seem to continue to embrace ultra-low and negative interest rates' potential to drive economic growth, or at the least, forestall a worsening of economic conditions. They point to the fact that you cannot prove the counterfactual (i.e., that things would not have been far worse without their intervention), as well as the fact that economic growth sputtered every time accommodation was pared back. That being said, most economists seem to agree that as interest rates are pushed lower, the effectiveness of pushing them still lower suffers from some law of diminishing marginal returns.

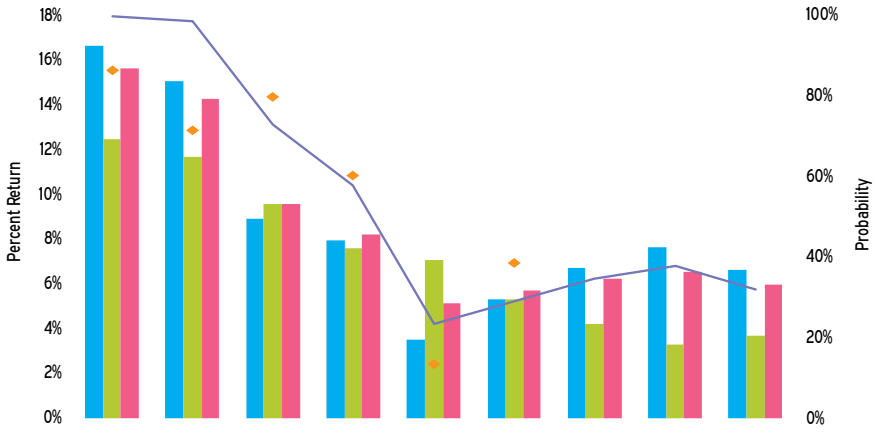
At the same time, economists also express caution about the potential side effects of ultra-low and negative interest rate policies such as distorted prices of financial assets, stress on the banking system, and more generally, the worry that borrowers become dependent on ultra-low interest rates to remain solvent. These concerns are not insignificant, as distorted asset prices can lead to financial asset bubbles whose eventual bursting can cause substantial destruction of wealth along with the associated damage to the general economy. Ultra-low and negative interest rates warp the traditional mechanisms through which banks lend and earn a profit. Since banks essentially work as the financial plumbing of the economy, distortions within the system can ripple through the broader economy. Lastly, there is substantial concern that borrowers may become dependent on ultra-low interest rates to remain solvent as they leverage their balance sheets to an extent that only makes sense when the cost of borrowing is next to nothing. If there is ever a hope to "normalize" rates, then corporations, individuals, and governments will need to have the balance sheet fortitude necessary to service debt at rates materially higher than they are today.

Implications for investors

The implications for having to invest in a world of monetary policy extremes, where seemingly impossible outcomes are a reality (e.g., negative yielding junk bonds), are profound. If asset prices become sufficiently distorted, wherein "safe" assets offer the guarantee of a certain loss of capital and risk assets offer substantial risk with only a modest potential for a return on capital, then it becomes more challenging to prudently allocate capital.

The level of distortion arising from the current interest rate environment is already putting stress on savers and capital allocators as they now earn little to nothing on their safe assets. This means that an investor's risk assets need to make up the difference for the loss of earnings on the safe assets. If the proportion in risk assets cannot make up the difference, the investor will either have to shift a larger allocation to risk assets or decrease their expected return assumptions; the latter comes with the corresponding demand to increase savings, which is often difficult to impossible. In this way, lower interest rates will continue to push investors to take on more risk in order to achieve the same rate of return.

The following chart (Figure 7) illustrates this in dramatic fashion. Expected return assumptions have declined in lockstep with the decline in interest rates. An investor in the 1980s had a relatively easy time achieving a 7.5% hurdle rate as the return assumptions for both equities and bonds well exceeded this rate. As a result, a portfolio allocated 65% to equities and 35% to bonds had no problem exceeding 7.5%. However, as interest rates declined, the return expectation for bonds also declined. The other item of note is the decline in equity return assumptions over this period as equity prices have increased relative to earnings, thus "borrowing" from future returns.



	1980	1985	1990	1995	2000	2005	2010	2015	2019
Equity Expected Return	16.6%	15.0%	8.9%	7.9%	3.5%	5.3%	6.7%	7.6%	6.6%
Bond Expected Return	12.4%	11.6%	9.6%	7.6%	7.0%	5.3%	4.2%	3.3%	3.7%
65/35 Eq/Bond Exp. Ret.	15.6%	14.2%	9.5%	8.2%	5.1%	5.7%	6.2%	6.5%	6.0%
Actual 10-Year Return	15.5%	12.8%	14.3%	10.8%	2.4%	6.9%			
Probability of Earning 7.5%	99%	98%	73%	58%	23%	29%	35%	38%	32%

FIGURE 7
Secular Decline in Investment Returns

Source: Bloomberg and FRED.

The chart also illustrates the difficulty of a simple 65% equity 35% bond portfolio hitting a 7.5% target return in the current environment. In order to come closer to the 7.5%, investors need to consider allocating a greater amount to equities and consider other types of risk assets such as private equity to boost returns. For capital allocators, this situation can only be continued for so long until it is untenable, as the risk undertaken to meet the return hurdle reaches a point that it puts the solvency of the entire system in jeopardy.

This is the tenuous situation investors find themselves in today's ultra-low interest rate environment. While we have only taken the first few steps down this precarious path, it is not a pleasant one for savers and capital allocators, as it is one besieged by uncertainty and risk. After stripping away all the intricacies and technicalities, negative interest rates in Europe and Japan, coupled with negative real yields in the U.S., ultimately function as a mechanism to transfer wealth from savers to borrowers. They essentially reallocate capital from those with abundant capital to those with a shortage of capital. As savers and capital allocators, we are the ones with "excess capital" that central bank actions redistribute. While we make no judgement on the merits of the rebalancing, it is incumbent on us to navigate the redistribution process as efficiently as possible. This means remaining diversified, pursuing investments where return expectations are reasonable relative to the risk, and having the fortitude to walk away from investments in which the risk/return profile has become distorted.

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