INVESTMENT NEWSLETTER

Assessing the merits of bitcoin as an investment can be problematic.

TALES FROM THE CRYPTO: HOW TO THINK ABOUT BITCOIN

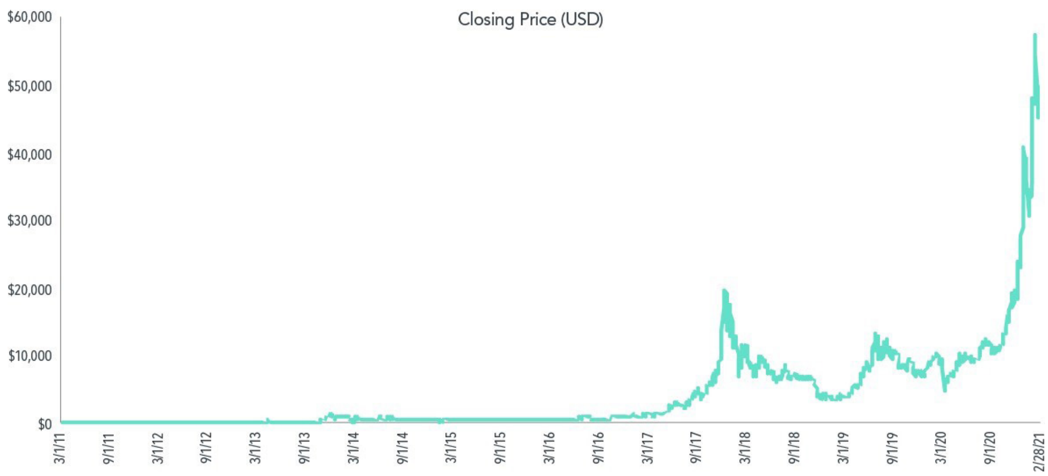
MARCH 10, 2021 | Dimensional Fund Advisors

"Everything you don't understand about money combined with everything you don't understand about computers."—HBO's Last Week Tonight with John Oliver, March 11, 2018

Bitcoin and related cryptocurrencies (now numbering in the thousands) are the subject of much debate and fascination. Given bitcoin's dramatic price changes, it is not surprising that many are speculating about its possible role in a portfolio.

Exhibit 1
Bit Player

Price of bitcoin for the last 10 years, March 2011–February 2021



Past performance is no guarantee of future results. Note: Data from Investing.com.

In its relatively short existence, bitcoin has proved extraordinarily volatile, sometimes gaining or losing more than 40% in price in a month or two. Any asset subject to such sharp swings may be catnip for traders but of limited value either as a reliable medium of exchange (to replace cash) or as a risk-reducing or inflation-hedging asset in a diversified portfolio (to replace bonds).

Assessing the merits of bitcoin as an investment can be problematic. Adding it to a portfolio could mean paring back the allocation to investments such as stocks, property, or fixed income. The owner of stocks or real estate generally expects to receive future income from dividends or rent, even though the size and timing of the payoff may be uncertain. A bondholder generally expects to receive interest payments as well as the return of principal. In contrast, holding bitcoin is similar to holding gold as an investment. Even if bitcoin or gold are held for decades, the owner may never receive more bitcoin or gold, and unlike stocks and bonds, it is not clear that bitcoin offers investors positive expected returns.

Putting aside squabbles over the future value of bitcoin or other cryptocurrencies, there are other issues investors should consider:

- Bitcoin is not backed by an issuing authority and exists only as computer code, generally kept in a so-called "digital wallet," accessible through a password chosen by the user. Many of us have forgotten or misplaced computer passwords from time to time and have had to contact the sponsor to restore access. No such avenue is available to holders of bitcoin. After a limited number of password attempts, a user can permanently lose access. Since there is no central authority responsible for bitcoin, there is no recourse for the forgetful owner: a recent New York Times article profiled the holder of more than $200 million worth of bitcoin that he can't retrieve. His anguish is apparently not unusual—a prominent cryptocurrency consulting firm estimates that 20% of all outstanding bitcoin represents stranded assets unavailable to their rightful owners.[1]
- Mt. Gox, a Tokyo-based bitcoin exchange launched in 2010, was at one time the world's largest bitcoin intermediary, handling over one million accounts in 239 countries and more than 90% of global bitcoin transactions in 2013. It suspended trading and filed for bankruptcy in February 2014, announcing that hundreds of thousands of bitcoins had been lost and likely stolen.[2]
- The UK Financial Conduct Authority cited a number of concerns as it prohibited the sale of "cryptoasset" investment products to retail investors last year. Among them were the inherent nature of the underlying assets, which have no reliable basis for valuation; the presence of market abuse and financial crimes in cryptoasset trading; extreme price volatility; an inadequate understanding by retail consumers of cryptoassets; and the lack of a clear investment need for investment products referencing them.[3]

The financial services industry has a long tradition of innovation, and cryptocurrency and the technology surrounding it may someday prove to be a historic breakthrough. For those who enjoy the thrill of speculation, trading bitcoin may hold appeal. But those in search of a sound investment should consider the concerns of the Financial Conduct Authority above before joining the excitement.

1. Nathaniel Popper, "Lost Passwords Lock Millionaires Out of Their Bitcoin Fortunes," New York Times, January 12, 2021.
2. Alexandra Harney and Steve Stecklow, "Twice Burned – How Mt. Gox Bitcoin Customers Could Lose Again," Reuters, November 16, 2017.
3. "Prohibiting the sale to retail clients of investment products that reference cryptoassets," Financial Conduct Authority, June 10, 2020.

EVALUATING FIXED INCOME THROUGH THE LENS OF YOUR GOALS

MARCH 17, 2021 | Dimensional Fund Advisors

KEY TAKEAWAYS

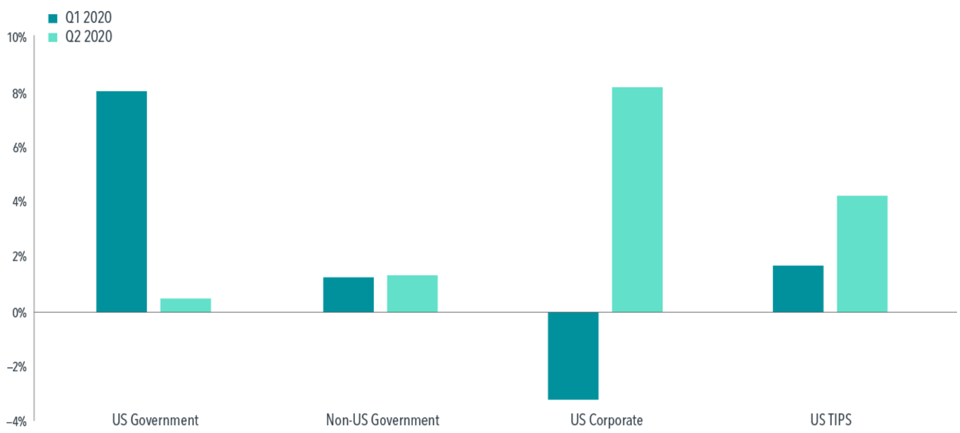
- The year 2020 saw stark differences in returns between fixed income categories—some of the largest in history.
- This unprecedented return dispersion is a reminder that fixed income asset classes can behave very differently, so allocations should be tailored to an investor's goals.
- A one-size-fits-all approach to fixed income may lead to suboptimal results.

The first half of 2020 saw nearly unprecedented return dispersion across certain segments of fixed income. Globally, government bonds strongly outperformed corporate bonds in the first quarter. In particular, the spread in first-quarter returns between US Treasuries and US corporates was more than 11 percentage points, the largest quarterly return difference between the two in a sample going back a half century. Of course, the second quarter saw a sharp bounce-back for US credit, with US corporates outperforming US Treasuries by more than 7.7 percentage points. Historically, this represented the second-largest quarter of outperformance for US credit.

These outcomes are a reminder that fixed income asset classes can behave very differently, and that the choice of fixed income should be tailored to one's specific needs and goals. This also implies that the framework for evaluating fixed income should be dictated by one's goals. For example, the characteristics of a fixed income strategy that appeals to investors eyeing capital preservation may differ substantially from those of a strategy seeking to manage future cash flow liabilities. One's investment goals should drive the evaluation process in fixed income investing. Three case studies illustrate this principle.

Exhibit 1
Class Action

Quarterly returns for US fixed income asset classes in 1H 2020



Past performance is no guarantee of future results. In USD. US Government bonds represented by the Bloomberg Barclays US Government Bond Index. Non-US Government bonds represented by the FTSE Non-USD World Government Bond Index (hedged to USD). US Corporates represented by the Bloomberg Barclays US Credit Bond Index. US TIPS represented by the Bloomberg Barclays US TIPS Index.

A HOLISTIC VIEW OF FIXED INCOME

For investors seeking return stability from their fixed income, a key part of the evaluation is their overall asset allocation. Components elsewhere in an investor's portfolio may be a major determinant in how adding fixed income impacts asset allocation volatility.

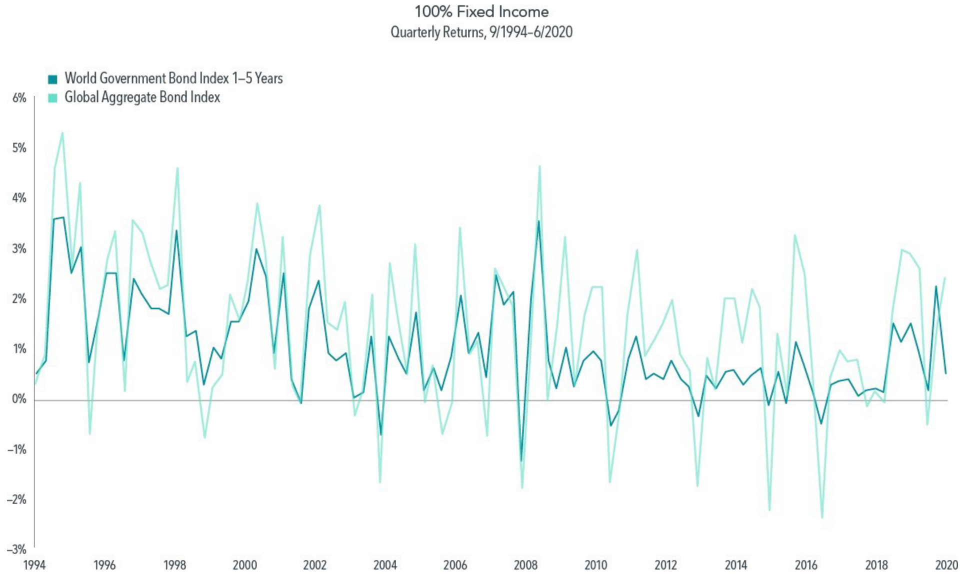
Let's take, for example, the decision of where to settle when it comes to duration and credit quality—how much exposure to longer-dated or lower-rated bonds should an investor pursue? As the top panel of **Exhibit 2** illustrates, a global aggregate bond index holding a wide range of maturities and credits has had higher return variability than a shorter-term, higher-quality government bond index. Looking only at this data, an investor prioritizing return stability may view the government bond allocation as more appealing.

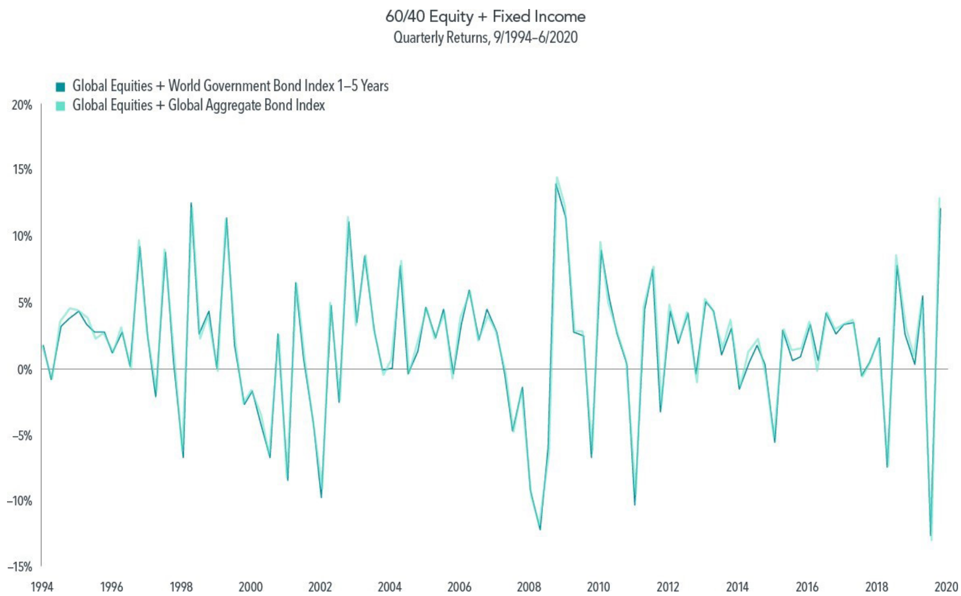
However, this sleeve of fixed income is unlikely to be the only component in an investor's portfolio. Many investors may also hold stocks, and when held in meaningful proportions, equity components can often be the main driver of portfolio volatility. As a corollary, the impact on overall volatility from duration or credit exposure within fixed income can be less meaningful for portfolios with equity-heavy allocations. The bottom panel of **Exhibit 2** helps illustrate this for two 60/40 stock/bond allocations. Return volatility is very similar, whether the fixed income allocation consists of short-term government bonds or a more core approach that holds a broader portion of the bond market.

Exhibit 2
What (Else) Is in Your Wallet?

Quarterly returns for allocations with fixed income, June 1994–June 2020

Past performance is no guarantee of future results. In USD. Global equities are represented by the MSCI All Country World Index (gross dividends), which begins in 1988. World Government Bond Index 1–5 Years provided by Citigroup. Global Aggregate Bond Index provided by Bloomberg Barclays. Fixed income returns hedged to USD. Portfolios rebalanced monthly. Indices are not available for direct investment. MSCI data © MSCI 2021, all rights reserved





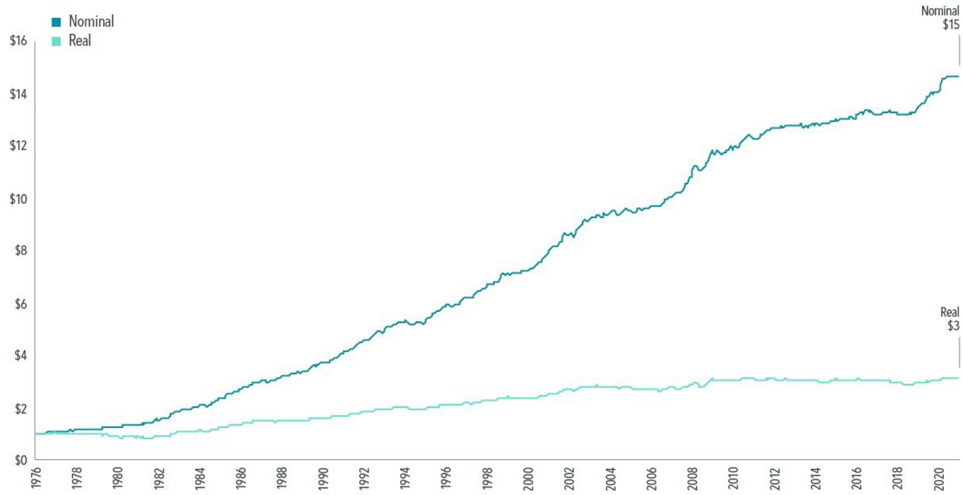
LET'S GET REAL

Some investors may prioritize preservation of purchasing power, or the amount of goods and services their savings can afford in the future. In this case, fixed income may be better evaluated through the lens of uncertainty in real, rather than nominal, returns. As **Exhibit 3** highlights, inflation can substantially impact a fixed income portfolio's growth of wealth in real terms.

Inflation-hedging assets such as Treasury Inflation-Protected Securities (TIPS) can help mitigate the impact of unexpected changes in inflation. A TIPS bond's face value and subsequent interest payments are adjusted in response to changes in the Consumer Price Index (CPI). The result is TIPS holders get paid actual inflation—based on the increase or decrease in the CPI.

Exhibit 3
Inflation Matters

Growth of a dollar for short-term US Treasuries, January 1976–December 2020



Past performance, including hypothetical performance, is no guarantee of future results. Short-term US government bonds represented by the Bloomberg Barclays US Treasury Bond Index 1–5 Years. Real returns computed each month are net of changes in US CPI. Data presented in the Growth of $1 chart is hypothetical and assumes reinvestment of income and no transaction costs or taxes. Chart is for illustrative purposes only and is not indicative of any investment. Bloomberg Barclays data provided by Bloomberg.

TIPS eliminate the inflation-related component from real return volatility. This can be observed in the returns for TIPS of various maturities shown in **Exhibit 4**—all have had lower volatility in real vs. nominal returns. In other words, TIPS have had lower uncertainty in units of the goal (real wealth) for investors focused on future purchasing power.

Another observation we can glean from these data is that the difference between nominal and real return volatility is relatively smaller for indices composed of longer- maturity TIPS. While inflation protection removes the inflation component of real return uncertainty, the component related to changes in real interest rates remains. Sensitivity to real rates increases with duration, and this source of variance is present whether returns are assessed in real or nominal units.

Exhibit 4
Real Deal

Annual returns for US TIPS indices, 2002–2020

	1–5 Years		5–10 Years		10+ Years	
	Nominal	Real	Nominal	Real	Nominal	Real
Mean	3.67%	1.55%	5.52%	3.36%	8.17%	5.96%
Std Dev	4.26%	3.65%	6.32%	5.77%	10.68%	10.22%

Performance data shown represents past performance and is no guarantee of future results. In USD. Data shown for Bloomberg Barclays US TIPS Index 1–5 Years, Bloomberg Barclays US TIPS Index 5–10 Years, and Bloomberg Barclays US TIPS Index 10+ Years. Bloomberg Barclays data provided by Bloomberg.

Whether an investor's goal is real or nominal in nature, longer-duration bonds increase volatility in wealth units, or the value of an account balance. But what if progress toward the goal is not well specified in wealth terms?

INCOME IS THE OUTCOME

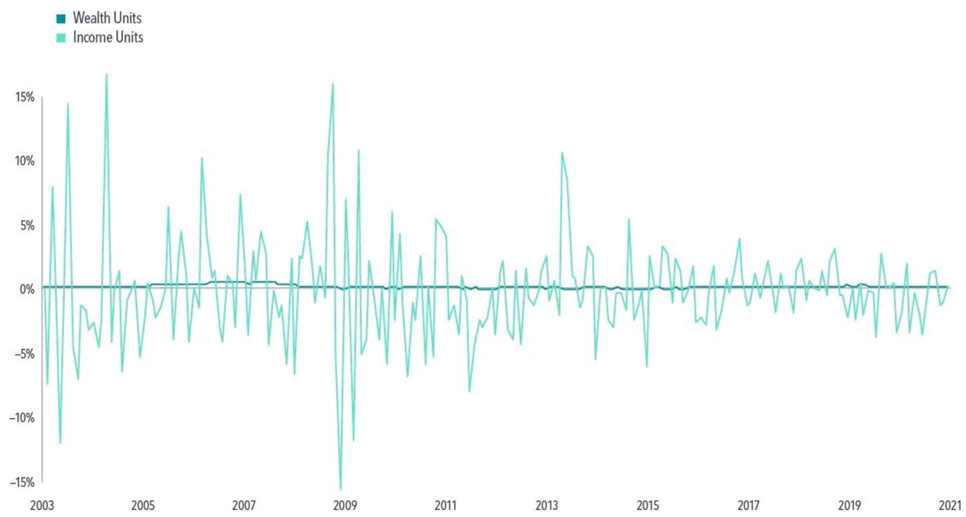
Let's say an investor's goal is to prepare for retirement income. Supporting consumption in retirement requires funding a string of cash flows, which represents a future liability for this investor. Risk management in this scenario can mean reducing the uncertainty around the amount of future income that can be drawn from the investor's current savings. Consequently, the risk-mitigating asset for this goal can be a portfolio of assets whose value changes commensurately with the cost of funding future income.

Exhibit 5 illustrates the role this plays in the evaluation of fixed income. When viewed in wealth terms, representing the magnitude of fluctuation in one's account balance, One- Month US Treasury Bill (T-bill) returns have been very stable. For investors prioritizing capital preservation, this is an appealing characteristic.

A different story emerges when evaluating T-bills through the lens of supporting future liabilities. Since the goal is to reduce the uncertainty of meeting these liabilities, a more sensible metric may be the volatility of returns in income units (the amount of income that can be drawn in the future), scaling the T-bill returns by changes in the price of an income stream sustainable for 25 years of retirement. Income unit returns are much more

Exhibit 5
Earnings Estimates

Monthly returns for one- month US Treasury bill in wealth units vs. income units, January 2003– January 2021



Past performance is no guarantee of future results. Indices are not available for direct investment. Monthly returns in wealth units are the returns of the one-month T-bill from Ibbotson/Morningstar (January 2003–January 2021). Monthly returns in income units are the returns of one- month T-bill from Ibbotson/Morningstar (January 2003–February 2017) adjusted by monthly change in the cost of a $1 cash flow for 25 years starting in January 2015. Actual results may vary from any forward-looking assumptions.

volatile for T-bills. Because the duration of T-bills is far shorter than that of the liability, T- bill returns cannot keep up with changes in the value of the liability. The result can be substantial uncertainty related to how much one's current savings can support in terms of consumption during the retirement period if invested in T-bills. So, what one investor might consider a low-risk asset may pose considerable risk to another investor with different goals.

IF THE SHOE FITS

The year 2020 provided all sorts of unsolicited reminders about the importance of various investment principles, from sticking to an investment approach to maintaining a disciplined focus on value. Global bond markets were no exception, as the extreme return deviations among different segments of fixed income reminded us that fixed income allocations should be matched to the investor's particular goal. As with clothing, a one-size-fits-all approach to fixed income may lead to suboptimal results. To that end, it's important for an investor's goals to play a central role in how fixed income choices are evaluated. After all, one person's fashion statement is another person's faux pas.

Source: Dimensional Fund Advisors LP

GLOSSARY

Nominal Return: The rate of return on an investment without adjusting for inflation.
Real Return: The rate of return on an investment after adjusting for inflation

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