

Hedging Global Liquidity Risk with Bitcoin

Matthew Beck, CFA | December 2016

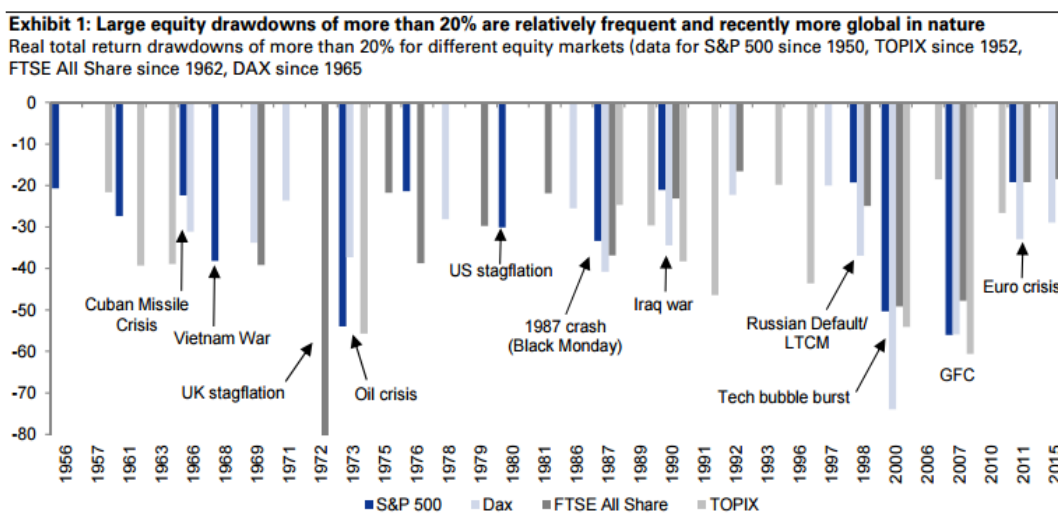
"Bitcoin is the beginning of something great: a currency without a government, something necessary and imperative." - **Nassim Taleb, Author of 'The Black Swan: The Impact of the Highly Improbable.'**

"Bitcoin and privately agreed upon blockchain technologies amongst a small set of global banks, are just a few examples of attempts to stabilize the value of their current assets in future purchasing power terms. Gold would be another example — historic relic that it is. In any case, the current system is beginning to be challenged."
- **Bill Gross, Founder of PIMCO and Senior Portfolio Manager at Janus Capital Group**

History Repeats Itself

Financial crises are common in occurrence and devastating in effect. The below chart from Goldman Sachs identifies a long list of large drawdowns across US, European, and Asian equity markets over the last 60+ years. For example, between October 2007 and March 2009 (amidst the Global Financial Crisis), the S&P 500 and several of its global equity counterparts, lost more than half of their value, erasing decades of wealth accumulation and challenging our understanding of market efficiency and systemic risk.

Unfortunately, these broad-based drawdowns in asset prices happen with greater frequency than most investors realize. Now, more than seven years into a bull market, it is crucial for investors to understand the dynamics of liquidity risk and the tools available to hedge before the next crisis emerges.



Source: Datastream, Bloomberg, Goldman Sachs Global Investment Research.

The Reality of Liquidity Risk

All investment decisions are relative. An equity portfolio manager may choose to allocate capital to various countries, sectors, and investment styles (ie: value, growth, momentum, etc.) while a strategic asset allocator may choose to deploy capital across various asset classes (ie: stocks, bonds, commodities, etc.). These decisions reflect managers' investment philosophies and intention to diversify their portfolios in normal economic cycles.

However, in a liquidity crisis, capital allocation decisions change. Investors must choose between holding safe-haven assets (that store value) and risk assets (with uncertain cash flows). As investors scramble for assets that they can ultimately use to fund their liabilities and preserve wealth (ie: cash, gold), stocks, bonds, and commodities have proven to selloff simultaneously. Time and again, we've witnessed asset correlations converge, reducing diversification benefits when investors need them most. All portfolios are exposed to liquidity risk because even well-diversified portfolios will face the "value now" versus "value later" dilemma.

A key component of liquidity risk is that it scales non-linearly with the amount of leverage in the financial system. This is especially important within the context of our current economic environment, since global debt is at an all-time high of *\$152 trillion*. Despite muted volatility across global markets in recent years, the looming risk of a liquidity crisis is also at an all-time high.

A New Way to Hedge

There are some tools available to hedge liquidity risk aside from market timing. For example, investors can purchase derivative contracts that provide protection in the event of a market meltdown. However, in recent years, the use of these instruments has been accompanied by high premiums, creating a significant drag on portfolio performance during prolonged periods of low volatility and ample liquidity.

For certain long-biased investors that do not wish to time markets or have their returns diminished by high premiums on protection, bitcoin may offer a unique investment opportunity. Bitcoin has a distinct set of properties unlike any other asset:

- **Store of value** characteristics, similar to real assets like gold (see our previous paper, *Bitcoin & the Rise of Digital Gold*).
- **Spending** characteristics, similar to cash (today you can spend bitcoin with over 100,000 merchants worldwide including Microsoft, Overstock.com, Expedia, PayPal, and Dell to name a few).
- And the **growth** characteristics of a new technology, as real applications for blockchain technology and decentralized digital assets continue to emerge and create value.

Source: International Monetary Fund. October 2016.

Because of these properties, bitcoin has the potential to provide wealth preservation and accumulation concurrently. While bitcoin may not be appropriate for all investors based on their investment mandate or market microstructure limitations, nimble, opportunistic investors may see the benefit of adding a bitcoin allocation to their portfolios.

Thriving in Crisis

In an attempt to better understand bitcoin's possible role as a hedge against liquidity risk, we'll look at bitcoin market action in the wake of four macroeconomic developments:

- Grexit and the 3-week Greek bank shutdown amid sovereign debt restructuring. (April – July 2015)
- Economic concerns in China and the subsequent devaluation of the renminbi (RMB) by the People's Bank of China. (August 2015 – November 2016)
- Brexit and the referendum vote for the United Kingdom to leave the European Union. (June 2016)
- Tighter financial conditions in the United States and rising geopolitical risk. (September – November 2016)

We'll then look at how a 1-3% allocation to bitcoin might have impacted the performance of the Global 60/40 through each of these events to see how bitcoin could benefit traditional investment portfolios.

Grexit

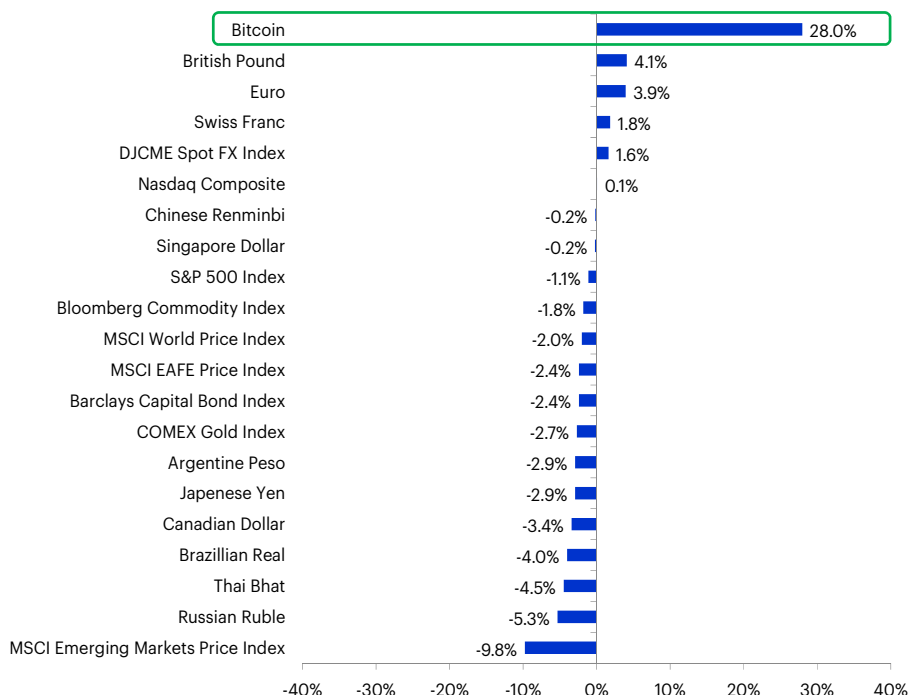
On January 27, 2015, Alexis Tsipras, leader of the Syriza party, announced the formation of a new government, igniting speculation of a Greek exit from the European Monetary Union. In the months that followed, a default on Greek debt seemed inevitable as political and financial experts around the world questioned the new government's ability and willingness to negotiate emergency funding ahead of impending obligations.

Perhaps the most interesting development of this period was the decision announced by the Greek government on June 28, 2015, to close state banks and impose strict capital controls on transactions. These restrictions remained in place for three weeks, while bailout terms were negotiated with international creditors.

The unprecedented move sparked serious concerns about the unilateral power that governments can exhibit over holders of centralized assets in times of crisis. During the liquidity freeze, bitcoin emerged as one of the only means by which to transfer value in or out of Greece, reinforcing this new asset's ability to return the power of control to the individual who holds it.

On July 13, 2015, an agreement was finally reached, avoiding Grexit and bringing an end to a three-month risk asset rout. In the time leading up to the agreement, bitcoin was a top performer, producing a return of 28% versus an average of just -1.7% for the twenty other asset classes and currencies below.

Grexit Drawdown April 20, 2015 – July 10, 2015



Economic Concerns in China

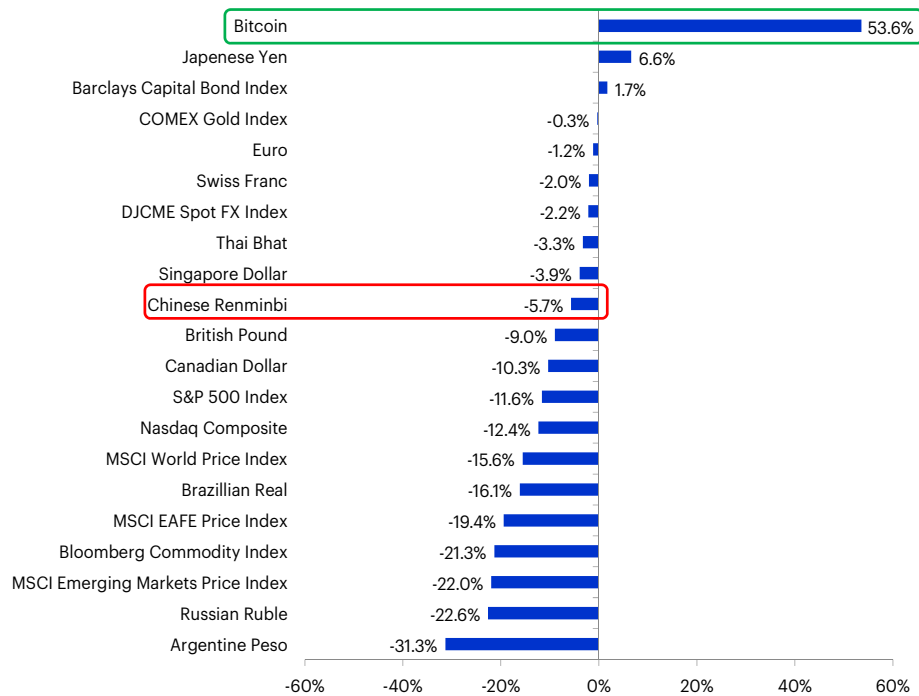
On August 10, 2015, the PBoC announced a significant change to its monetary policy amid local stock market turbulence and concerns over the health of the world's third largest economy. In an effort to stimulate export driven growth, Chinese policymakers lowered the RMB-USD reference rate by 1.9% and signaled the transition to a more "market driven" pricing regime. Following the renminbi's largest single day drop in over 20 years, investors repriced risk through a five-month selloff of global risk assets in favor of deflationary assets.

Between the day of the announcement and the trough of the drawdown (January 20, 2016), bitcoin was by far the best performer of the following major asset classes and currencies, producing a cumulative return of 53.6% versus an average return of -10.1% across the rest of the group.

Source: Bloomberg. Performance of bitcoin is based on the daily values of the Bloomberg Bitcoin Price Index (USD). Drawdown periods are defined based on a proprietary indicator measuring peak-to-trough declines of global risk assets.
Source: "World Economic Outlook Database". International Monetary Fund. October 2016.

China Drawdown

August 10, 2015 – January 20, 2016



Through November 2016, the renminbi has continued its decline, falling by roughly 10% versus the US dollar. Given the strong inverse relationship between the performance of bitcoin and the renminbi since the policy change, global investors might consider looking at bitcoin to hedge against China-driven liquidity risk, while local investors look to protect their wealth from structural currency devaluation.

XBT vs. RMB Cross Rate (USD)

August 10, 2015 – November 30, 2016



Source: Bloomberg. Performance of bitcoin is based on the daily values of the Bloomberg Bitcoin Price Index (USD). Drawdown periods are defined based on a proprietary indicator measuring peak-to-trough declines of global risk assets.

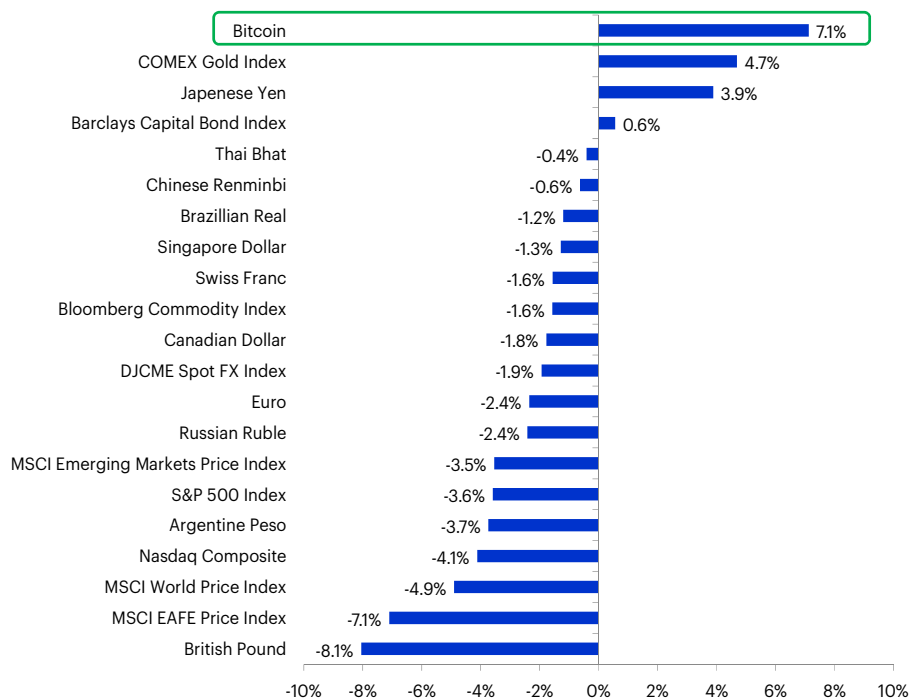
Brexit

On June 24th, 2016 the United Kingdom shocked the world as they announced the result of a referendum vote in favor of separation from the European Union. On the day of the announcement, we witnessed a broad-based selloff across almost every fiat currency and risk asset as the market attempted to digest whether Brexit would portend the distintegration of the entire European Union.

During the knee-jerk, one-day, global selloff, bitcoin was a top performing asset, boasting a return of 7.1% on strong volume, versus an average of -2.1% for the rest of the group. Once again, we watched bitcoin outperform other deflationary assets including gold, the Japanese yen, and global bonds.

Brexit Drawdown

June 24, 2016



In the wake of Brexit, the Eurozone continues to face an unprecedented economic challenge with continued weakness in both the pound sterling and euro. In light of this, investors might consider allocating a portion of their investable assets to bitcoin to help protect against contagion stemming from the world's second largest economy.

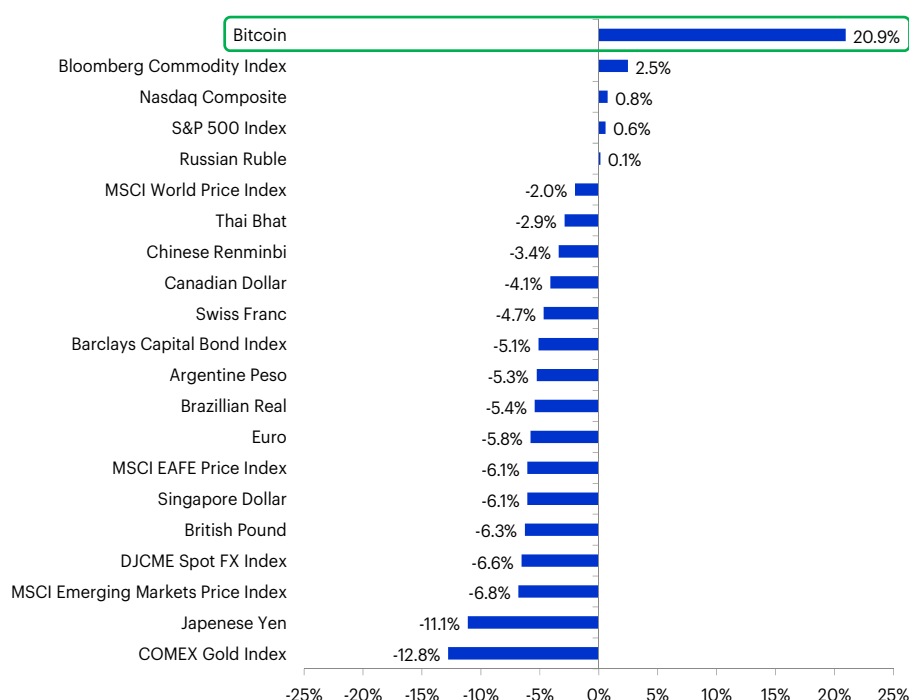
Source: Bloomberg. Performance of bitcoin is based on the daily values of the Bloomberg Bitcoin Price Index (USD). Drawdown periods are defined based on a proprietary indicator measuring peak-to-trough declines of global risk assets.

Tighter US Financial Conditions & Rising Geopolitical Risk

Tighter financial conditions in the United States and the rise of political populism globally are driving the latest selloff in risk assets. Over the last few months, US interest rate expectations have continued to grind higher on the prospects of monetary policy normalization by the Federal Reserve and fiscal expansion under President-elect Trump. At the same time, talk of protectionist trade and the continuation of easy monetary policies outside of the US are pushing the dollar to multi-year highs.

In this latest drawdown, we once again see bitcoin at the top of the performance charts, with a cumulative return of 20.9% through November, versus an average of -4.5% for the rest of the group during the same period.

Tight Money Drawdown
September 7, 2016 – November 30, 2016



There are significant shifts taking place in monetary and fiscal policies around the world that will likely impact global markets well into the future. While we don't know when or at what levels the current drawdown will end, it is clear that the challenges faced by policymakers will be difficult to manage given the complexity of our global financial system. Bitcoin could be a useful tool in helping investors insulate their portfolios from any failure to manage these problems effectively.

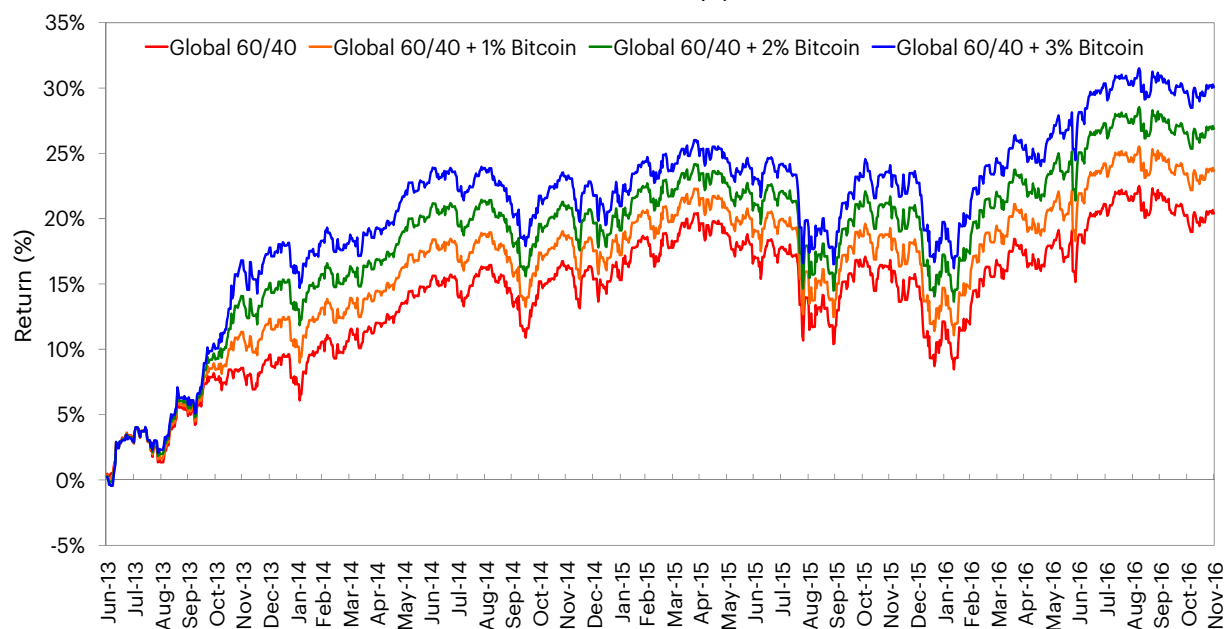
Source: Bloomberg. Performance of bitcoin is based on the daily values of the Bloomberg Bitcoin Price Index (USD). Drawdown periods are defined based on a proprietary indicator measuring peak-to-trough declines of global risk assets.

Bitcoin in Portfolio Construction

Now that we've reviewed some of the macro events that have impacted markets over the past few years, we'll look at how a traditional portfolio, such as the Global 60/40, might have performed with an allocation to bitcoin. We'll use Sharpe ratios as well as drawdowns (peak-to-trough declines) to measure bitcoin's influence on performance, volatility and event-driven liquidity risk.

Simulated Portfolio Performance June 30, 2013 through November 30, 2016				
Portfolio	Global 60/40	Global 60/40 + 1% Bitcoin	Global 60/40 + 2% Bitcoin	Global 60/40 + 3% Bitcoin
Cumulative Total Return	22.6%	26.7%	30.8%	35.1%
Annualized Total Return	6.1%	6.9%	7.9%	8.9%
Annualized Std Dev	8.2%	8.0%	8.1%	8.2%
Sharpe Ratio	0.75	0.86	0.98	1.08
Change in Annualized Return	--	0.8%	1.7%	2.7%
Change in Annualized Risk	--	-0.2%	-0.1%	0.0%
Ratio Improvement	--	15%	30%	44%

Simulated Portfolio Performance
Cumulative (ln)



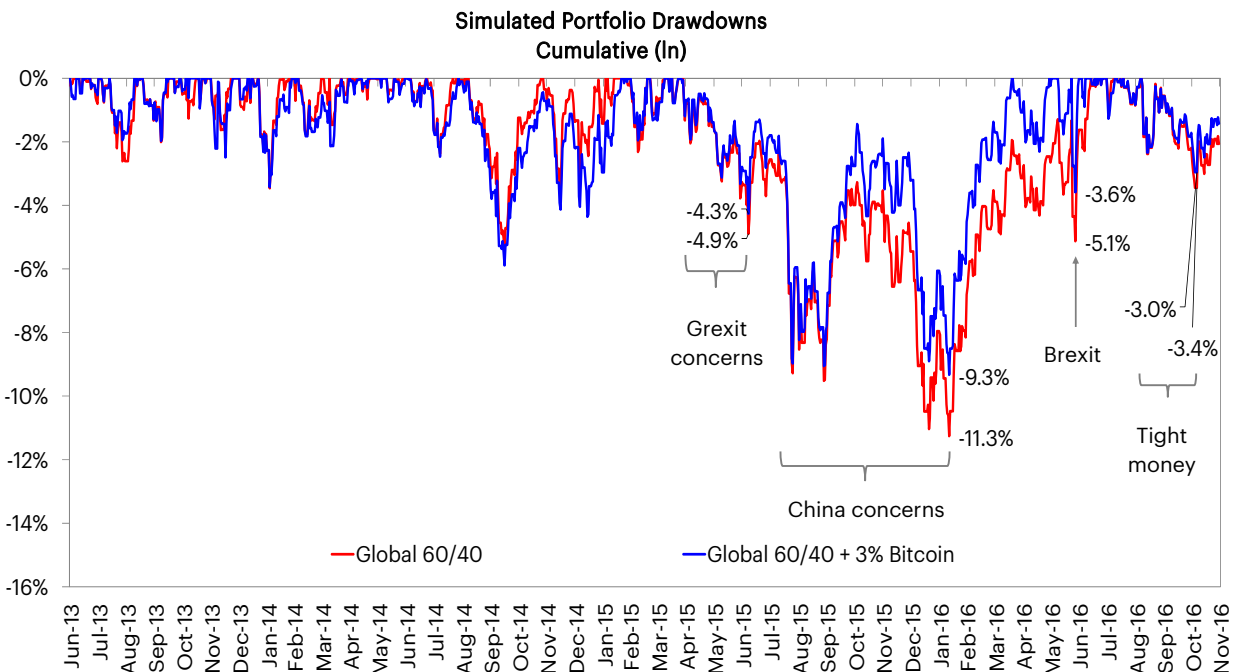
As you can see from the above figures, our analysis revealed that even small allocations to an uncorrelated asset like bitcoin can significantly enhance the returns of traditional portfolios, without a material impact on portfolio risk.

Source: Bloomberg. Performance is shown from June 30, 2013 through November 30, 2016. Performance of bitcoin is based on the daily values of the Bloomberg Bitcoin Price Index (USD). Global 60/40 consists of a 60% allocation to the iShares MSCI ACWI and a 40% allocation to the Vanguard Total International Bond ETF. WHERE SHOWN, HYPOTHETICAL OR SIMULATED PERFORMANCE RESULTS HAVE CERTAIN INHERENT LIMITATIONS. UNLIKE AN ACTUAL PERFORMANCE RECORD, SIMULATED RESULTS DO NOT REPRESENT ACTUAL TRADING OR THE COSTS OF MANAGING THE PORTFOLIO. ALSO, SINCE THE TRADES HAVE NOT ACTUALLY BEEN EXECUTED, THE RESULTS MAY HAVE UNDER OR OVER COMPENSATED FOR THE IMPACT, IF ANY, OF CERTAIN MARKET FACTORS, SUCH AS LACK OF LIQUIDITY. SIMULATED TRADING PROGRAMS IN GENERAL ARE ALSO SUBJECT TO THE FACT THAT THEY ARE DESIGNED WITH THE BENEFIT OF HINDSIGHT. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. PAST RESULTS ARE NOT INDICATIVE OF FUTURE PERFORMANCE.

- Allocating 1% bitcoin to the Global 60/40 increased annual returns by roughly 80 bps, reduced volatility by 20 bps, and improved the return-to-risk ratio by 15%.
- Allocating 2% bitcoin to the Global 60/40 increased annual returns by roughly 170 bps, reduced volatility by 10 bps, and improved the return-to-risk ratio by 30%.
- Allocating 3% bitcoin to the Global 60/40 increased annual returns by roughly 270 bps and improved the return-to-risk ratio by 44%, without increasing volatility.

Finally, as highlighted below, portfolios containing an allocation to bitcoin had lower average, maximum, and current drawdowns than those without.

Simulated Portfolio Performance June 30, 2013 through November 30, 2016				
Portfolio	Global 60/40	Global 60/40 + 1% Bitcoin	Global 60/40 + 2% Bitcoin	Global 60/40 + 3% Bitcoin
Max Drawdown	-11.3%	-10.6%	-10.0%	-9.3%
Average Drawdown	-2.5%	-2.3%	-2.2%	-2.1%
Current Drawdown	-2.1%	-1.9%	-1.6%	-1.4%



Source: Bloomberg. Performance is shown from June 30, 2013 through November 30, 2016. Performance of bitcoin is based on the daily values of the Bloomberg Bitcoin Price Index (USD). Global 60/40 consists of a 60% allocation to the iShares MSCI ACWI and a 40% allocation to the Vanguard Total International Bond ETF. WHERE SHOWN, HYPOTHETICAL OR SIMULATED PERFORMANCE RESULTS HAVE CERTAIN INHERENT LIMITATIONS. UNLIKE AN ACTUAL PERFORMANCE RECORD, SIMULATED RESULTS DO NOT REPRESENT ACTUAL TRADING OR THE COSTS OF MANAGING THE PORTFOLIO. ALSO, SINCE THE TRADES HAVE NOT ACTUALLY BEEN EXECUTED, THE RESULTS MAY HAVE UNDER OR OVER COMPENSATED FOR THE IMPACT, IF ANY, OF CERTAIN MARKET FACTORS, SUCH AS LACK OF LIQUIDITY. SIMULATED TRADING PROGRAMS IN GENERAL ARE ALSO SUBJECT TO THE FACT THAT THEY ARE DESIGNED WITH THE BENEFIT OF HINDSIGHT. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. PAST RESULTS ARE NOT INDICATIVE OF FUTURE PERFORMANCE.

Conclusion

While it is still very early in bitcoin's life cycle as an investable asset, we have identified evidence supporting the notion that it can serve as a hedge in a global liquidity crisis. Our conceptual understanding of bitcoin's properties, observations of its past responses to macroeconomic shocks, and increasing support from some of the top thought leaders in the investment management industry reinforce the idea that bitcoin could play a pivotal role in the construction of more efficient portfolios.

We certainly do not hope for the next crisis, but we understand that these shocks are an inevitable part of functioning financial markets, and do our best to prepare for them ahead of time. We will continue to analyze bitcoin market action to deliver investment insights as we learn more from our experience with this exciting new asset.

Performance through November 2016

Performance	1-Month	QTD	YTD	Trailing 1-Year	Trailing 3-Year (Annualized)
Bloomberg Bitcoin Price Index (USD)	5.9%	22.7%	72.0%	97.2%	-13.2%
SPDR S&P 500 ETF	3.7%	1.9%	9.8%	7.9%	9.0%
Vanguard Total International Bond ETF	-1.2%	-2.5%	4.2%	4.0%	4.5%
iShares MSCI ACWI	1.0%	-0.9%	6.3%	4.1%	3.3%
PIMCO 25+ Yr Zero Coupon US Trs ETF	-11.8%	-17.8%	2.6%	1.5%	12.2%
iShares iBoxx \$ High Yield Corporate Bd	0.0%	-1.0%	11.4%	9.1%	2.7%
iShares JPMorgan USD EM Bond	-4.3%	-6.0%	7.7%	6.0%	5.0%
SPDR Gold Trust	-8.4%	-11.1%	10.1%	9.6%	-2.5%
PIMCO 15+ Year US TIPS ETF	-4.3%	-6.5%	10.5%	8.4%	5.7%
iPath BBG Commodity	1.1%	0.8%	10.2%	6.3%	-13.3%
First Trust Dow Jones Internet ETF	-1.8%	-2.0%	7.1%	4.8%	12.3%
CBOE Volatility Index	-21.9%	0.3%	-26.8%	-17.4%	-0.9%

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Source: Bloomberg. Performance shown is gross of dividends. Performance of bitcoin is based on the daily values of the Bloomberg Bitcoin Price Index (USD).

PRICE VOLATILITY

Bitcoin has historically experienced significant intraday and long-term price swings.

MARKET ADOPTION

It is possible that bitcoin will never be broadly adopted by either the retail or commercial marketplace, in which case, bitcoin may lose most, if not all, of its value.

GOVERNMENT REGULATION

The regulatory framework of bitcoin remains unclear and application of existing regulations and/or future restrictions by federal and state authorities may have a significant impact on the value of bitcoin.

SECURITY

While the BIT has implemented powerful security measures for the safe storage of bitcoins, there have been significant incidents of bitcoin theft and bitcoin remains a potential target for hackers. Bitcoins that are lost or stolen cannot be replaced, as transactions are irrevocable.

TAX TREATMENT

On March 25, 2014 the Internal Revenue Service (IRS) released tax guidance applicable to digital and virtual currency stating "Under currently applicable law, virtual currency is not treated as currency that could generate foreign currency gain or loss for U.S. federal tax purposes...For federal tax purposes, virtual currency is treated as property. General tax principles applicable to property transactions apply to transactions using virtual currency." However, this can potentially change in the future.

Investors must have the financial ability, sophistication/experience and willingness to bear the risks of an investment. Please refer to the Bitcoin Investment Trust Private Placement Memorandum for a list of additional risk factors.

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