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Hedging Global Liquidity Risk with Bitcoin

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"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'***

Crises Are Becoming More Common and Global

Financial crises are becoming more common and global. The following chart from Goldman Sachs identifies a long list of large drawdowns across US, European, and Asian equity markets over the last sixty years, showing just how devastating their effects can be. For example, during the Global Financial Crisis (GFC) between October 2007 and March 2009, the S&P 500 and several of its global equity counterparts lost more than half of their value, erasing decades of wealth creation 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 ten years into a bull market for risk assets[2], it is crucial for investors to understand the dynamics of liquidity risk and the tools available to hedge before the next crisis materializes.

In this paper, we'll explore Bitcoin's potential role as a hedge against liquidity risk through the lens of five macroeconomic developments, including the recent escalation of US and China trade tensions.

1. Originally published December 2016. Updated as of June 11, 2019.
2. We define "risk assets" as those with uncertain cash flows and high sensitivities to credit and business cycles (e.g., equities, corporate bonds, industrial commodities, and commercial real estate). We define "wealth preservation" assets as those with hedged exposures to these forces (e.g., certain forms of cash, currency-hedged government bonds, gold, and in our view, Bitcoin).

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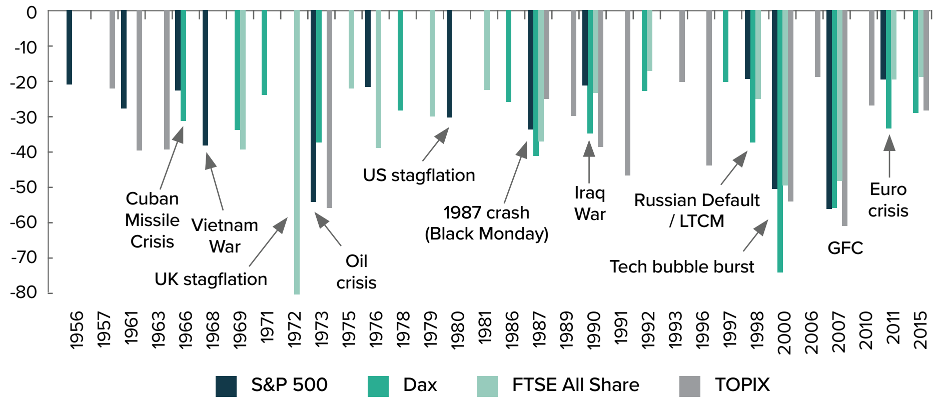
FIGURE 1: **LARGE EQUITY DRAWDOWNS ARE FREQUENT AND GLOBAL**[3]



What is Liquidity Risk?

Liquidity risk is the risk of a real[4] decline in wealth resulting from (1) an imbalance in the amount of money and credit relative to debt in a given economy and (2) how exposed an investor's portfolio is to that imbalance. Generally, this imbalance can take one of two forms: deflation or inflation. When there is not enough liquidity to service debts or stimulate economic growth, the result is deflation, while too much can spur excessive inflation.

In the modern macroeconomic order, liquidity is primarily controlled via fiscal and monetary policies enacted by federal governments and central banks. How liquidity is transmitted and the mechanisms through which it will be managed (or mismanaged) has important implications for the performance of markets and asset classes, and consequently the optimal construction of investor portfolios. The truth is, most traditional portfolios lack adequate diversification to protect against liquidity risk because they are heavily concentrated in equities, which typically respond negatively to both deflationary and inflationary pressures (e.g., the Global 60/40).

When building a portfolio, it's important to keep in mind that all investment decisions are relative. For example, an equity portfolio manager may choose to allocate capital to various countries, sectors, and investment styles (e.g., value, growth, momentum) while a strategic asset allocator may choose to deploy capital across various asset classes (e.g., equities, bonds, commodities, real estate). These are typical allocation decisions that managers make in normal economic cycles as they seek to diversify their portfolios and generate returns that match or exceed a given benchmark.

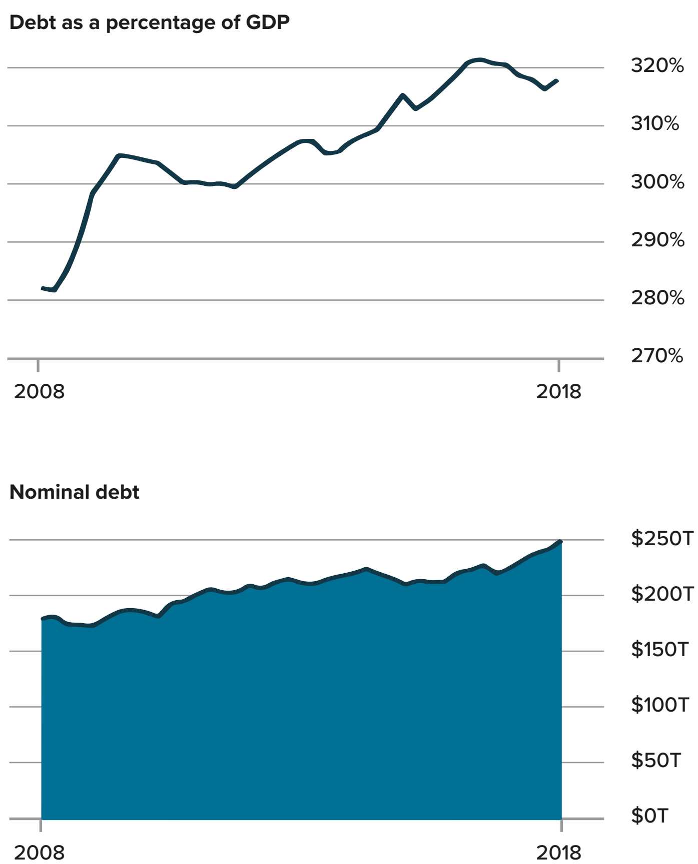
However, in a liquidity crisis, capital allocation decisions change. Investors make choices between holding risk assets with uncertain cash flows and high

3. Source: Datastream, Bloomberg, Goldman Sachs Global Investment Research.
4. Real prices are adjusted for general price level changes over time, i.e., inflation or deflation. Nominal prices, sometimes called current-dollar prices, measure the dollar value of a product at the time it was produced. Source: Federal Reserve Bank of St. Louis.

sensitivities to credit and business cycles (e.g., equities, corporate bonds, industrial commodities, and commercial real estate) versus wealth preservation assets with hedged exposures to these forces, including the currency devaluations that often follow (e.g., certain forms of cash, currency-hedged government bonds, gold, and in our view, Bitcoin).[5] Time and again, we've witnessed risk asset correlations converge, reducing diversification benefits when investors need them most.

A key component of liquidity risk is that it scales non-linearly with the amount of leverage in the financial system. This is particularly important within the context of our current economic environment, since global debt is at an all-time high of roughly $250 trillion and debt-to-GDP is over 300%.[6] Despite muted volatility across global markets in recent years, the looming risk of a liquidity crisis is also high.

FIGURE 2: **THE WORLD'S $250 TRILLION DEBT**[7]



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5. Source: Bridgewater Associates: The All Weather Strategy: Transitioning to the Safe Portfolio in a Depressionary Environment. http://sdcera.granicus.com/MetaViewer.php?view_id=4&clip_id=75&meta_id=9141.
6. Source: Bloomberg. Global Debt of $244 Trillion Nears Record Despite Faster Growth. January 15, 2019. Chibuike Oguh and Alexandre Tanzi. https://www.bloomberg.com/news/articles/2019-01-15/global-debt-of-244-trillion-nears-record-despite-faster-growth.
7. Source: Bloomberg. The World's $250 Trillion In Debt: the World's Post-Lehman Legacy. September 13, 2018. Brian Chappatta. https://www.bloomberg.com/graphics/2018-lehman-debt/.

A New Way to Hedge

What makes Bitcoin such an exciting financial technology and investment opportunity is that it has a distinct set of properties unlike any other asset. Through this unique mix of properties, Bitcoin has the potential to perform well over the course of normal economic cycles as well as liquidity crises, especially those involving currency devaluations. These properties are as follows:

- ***Store-of-value*** characteristics similar to real assets like gold, with hard-money attributes like immutable scarcity. (For more, see our previous paper, *Bitcoin & the Rise of Digital Gold*). **(Positive in Liquidity Crisis)**
- ***Spending*** characteristics similar to cash. Today, you can spend bitcoin with over 100,000 merchants worldwide including Whole Foods, AT&T, Microsoft, Overstock.com, Expedia, PayPal, and Dell to name a few. Bitcoin also has trading pairs with every major fiat currency, making it a ubiqitous medium-of-exchange. **(Positive in Liquidity Crisis)**
- ***Growth*** characteristics of a new technology as real applications for blockchain technology and decentralized digital assets continue to emerge and create value, stimulating further demand. **(Positive in Normal Economic Cycles)**

With continued adoption, Bitcoin represents a transparent, immutable, and global form of liquidity that can provide both wealth preservation and growth opportunities. As a result, we believe it deserves a steady strategic position within many long-term investment portfolios. While Bitcoin may not be appropriate for all investors based on their investment mandate or market microstructure limitations, some may see the benefit of adding an allocation to their portfolios.

Thriving in Crisis

To better understand Bitcoin's potential role as a hedge against liquidity risk, we'll look at Bitcoin market action in the wake of five macroeconomic developments:

1. **Grexit** and the 3-week Greek bank shutdown amid sovereign debt restructuring, sparking a physical liquidity crisis. (April – July 2015)
2. **Economic concerns in China** resulting in a surprise shift in monetary policy by the People's Bank of China (PBoC) and structural devaluation of the renminbi (RMB). (August 2015 – December 2016)
3. **Brexit** followed by a knee-jerk selloff and a steady decline in the pound sterling (GBP) and euro (EUR). (June – December 2016)
4. **Rising geopolitical risk and tighter financial conditions in the US** leading to global growth concerns and weakness in the currencies of major US trading partners. (September – December 2016)
5. **Escalation of US and China trade tensions** posing systemic risks to global economic growth and placing further pressure on the RMB. (May 2019 – Present)

Grexit
(April – July 2015)

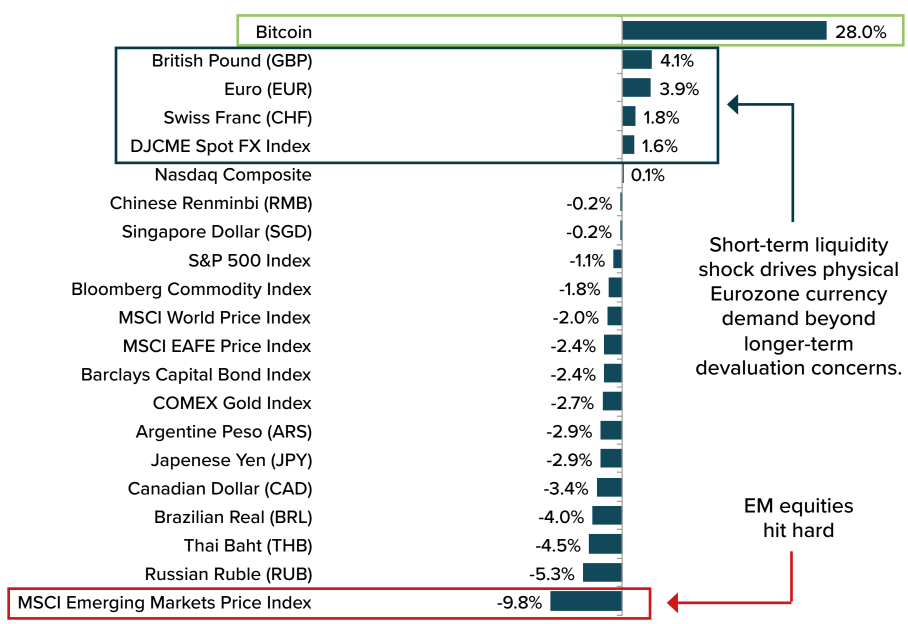
On January 27, 2015, Alexis Tsipras, leader of the Syriza party, announced the formation of a new government, igniting speculation of a Greek exit from the European Monetary Union. In the months that followed, a default on Greek debt seemed inevitable as political and financial experts around the world 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 markets and currencies below.

FIGURE 3: **GREXIT DRAWDOWN**[8]
APRIL 20, 2015 – JULY 10, 2015



8. 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.

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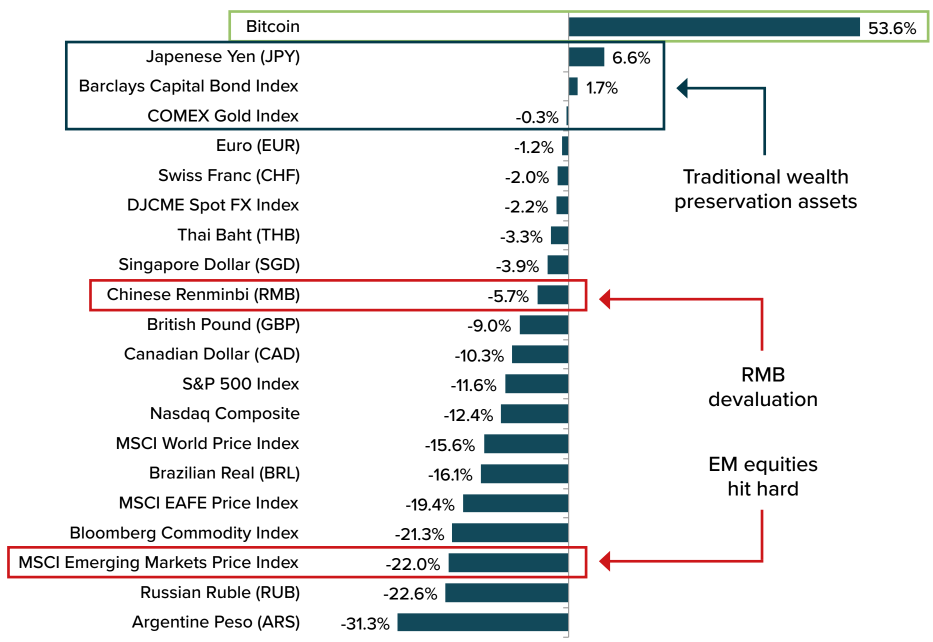
Economic Concerns in China
(August 2015 – December 2016)

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 second largest single-country economy.[9] 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 RMB's largest single day drop in over twenty years, investors repriced risk through a five-month selloff of global risk assets in favor of wealth preservation assets.

Between the day of the announcement and the trough of the drawdown (January 20, 2016), Bitcoin largely outperformed the following major markets and currencies, producing a cumulative return of 53.6% versus an average return of -10.1% across the rest.

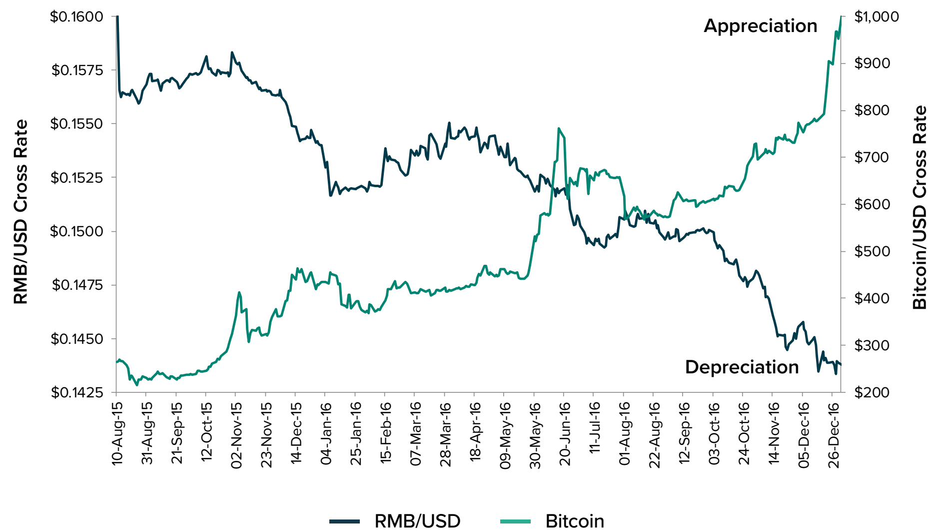
FIGURE 4: **CHINA DRAWDOWN**[10]
AUGUST 10, 2015 – JANUARY 20, 2016



Through December 2016, the RMB continued its decline, falling by roughly 11% versus the US dollar. Given the strong inverse relationship between the performance of Bitcoin and the RMB 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.

9. Source: "World Economic Outlook Database". International Monetary Fund. October 2016.
10. 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.

FIGURE 5: **RMB VS. BITCOIN SPOT RATE (USD)**[11]
AUGUST 10, 2015 – DECEMBER 31, 2016



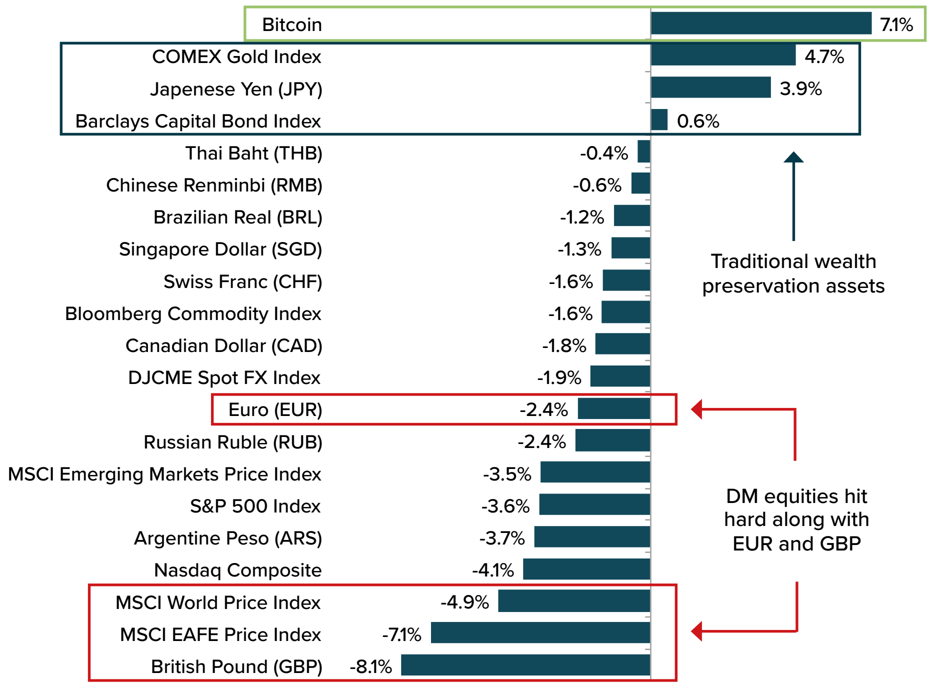
Brexit
(June – December 2016)

On June 24, 2016 the United Kingdom shocked the world as they announced the result of a referendum vote in favor of separation from the European Union (EU). On the day of the announcement, we witnessed a broad-based selloff across both fiat currencies and risk assets as the market attempted to digest whether Brexit would portend the disintegration of the 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 perceived safe-haven assets including gold, the Japanese yen (JPY), and global bonds.

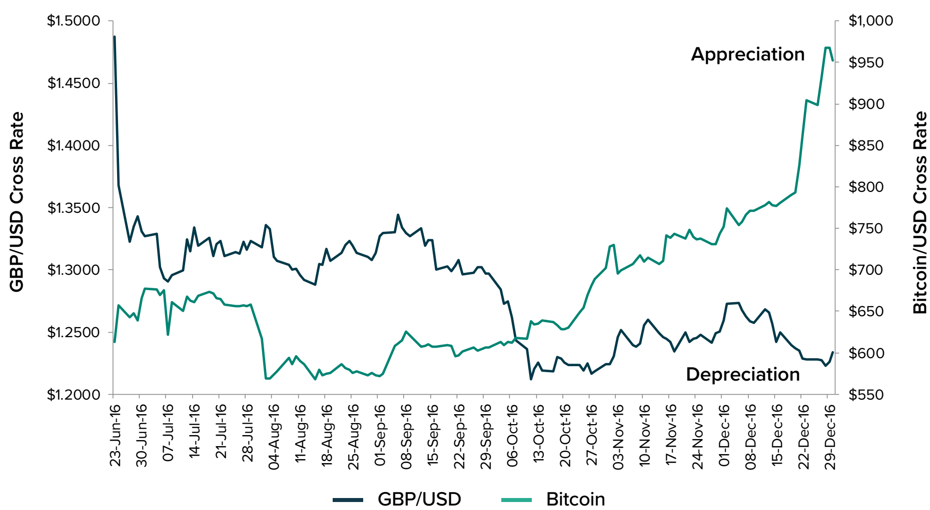
11. Source: Bloomberg. Performance of Bitcoin is based on the daily values of the Bloomberg Bitcoin Price Index (USD).

FIGURE 6: **BREXIT DRAWDOWN**[12]
JUNE 24, 2016



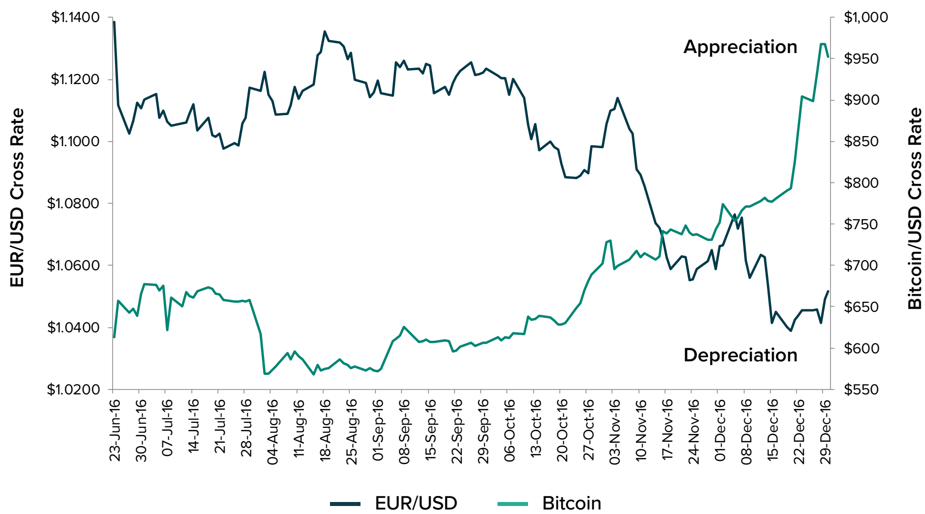
In the aftermath of the Brexit referendum vote, weakness in both the GBP and EUR continued through the end of 2016, as Eurozone policymakers and investors grappled with an unprecedented economic challenge and the ways it might unfold.

FIGURE 7: **GBP VS. BITCOIN SPOT RATE (USD)**[13]
AUGUST 10, 2015 – DECEMBER 31, 2016



12. 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.
13. Source: Bloomberg. Performance of Bitcoin is based on the daily values of the Bloomberg Bitcoin Price Index (USD).

FIGURE 8: **EUR VS. BITCOIN SPOT RATE (USD)**[14]
AUGUST 10, 2015 – DECEMBER 31, 2016



Now, three years later, Members of Parliament (MPs) are still negotiating the withdrawal agreement detailing when, how, and under what conditions the UK will leave the EU. After failing to gain approval three separate times in the first quarter of 2019, the deadline for the withdrawal deal has been extended to October 31, 2019. With so many details of the transition plan still unknown, global investors might consider allocating a portion of their investable assets to Bitcoin to help protect against contagion stemming from the Eurozone, the world's second largest economy.

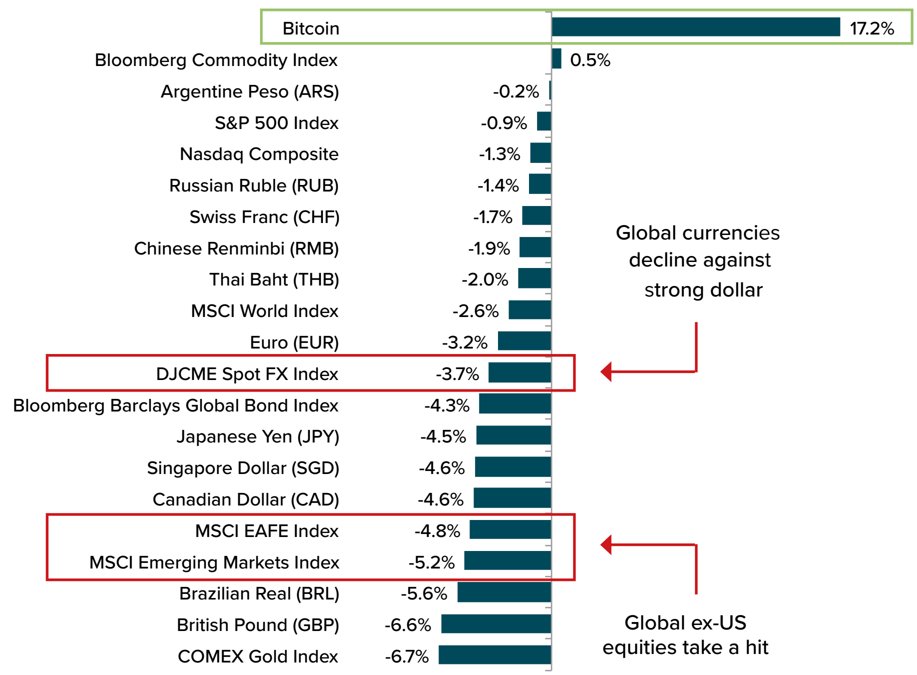
Rising Geopolitical Risk & Tighter US Financial Conditions
(September - December 2016)

Tighter financial conditions and rising geopolitical risk surrounding the 2016 US presidential election drove a multi-month selloff in risk assets. In the two months leading up the election, interest rate expectations accelerated 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 policies (which have since materialized) and the continuation of easy monetary policies outside of the US were pushing the dollar to multi-year highs.

From the beginning of the drawdown to the trough on November 10, 2016, Bitcoin topped the performance charts, with a cumulative return of 17.2%, versus an average of –3.5% for the other markets and currencies in Figure 9.

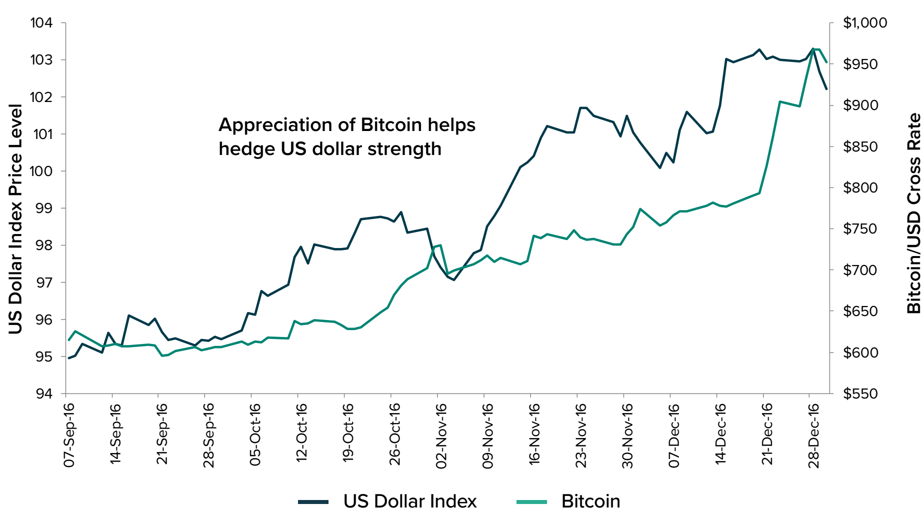
14. Source: Bloomberg. Performance of Bitcoin is based on the daily values of the Bloomberg Bitcoin Price Index (USD).

FIGURE 9: **TIGHTER US CONDITIONS DRAWDOWN**[15]
SEPTEMBER 7, 2016 – NOVEMBER 10, 2016



Even after risk assets began to recover in mid-November, global currencies continued to slide through the end of the year. As you can see from Figure 8, a Bitcoin position may have helped insulate global portfolios from the risks of a rising dollar and tighter financial conditions in the US.

FIGURE 10: **US DOLLAR INDEX VS. BITCOIN SPOT RATE (USD)**[16]
AUGUST 10, 2015 – DECEMBER 31, 2016



15. 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.
16. Source: Bloomberg. Performance of Bitcoin is based on the daily values of the Bloomberg Bitcoin Price Index (USD).

US-China Trade Tensions Escalate
(May 5, 2019 - ?)

Though trade tensions formally began between the US and China back in 2017, the dispute escalated in the second quarter of 2019.[17] On May 5, 2019, US President Donald Trump caught market participants by surprise as he announced a tariff increase on $200 billion of annual Chinese imports, from 10% to 25%. In response, Beijing announced its own series of retaliatory tariffs on US goods. Given that the US and China are currently the two largest single-country economies in the world (representing more than $35 billion in annual GDP or roughly 40% of the annual global economic output), further escalation could pose significant contagion risks to the global economy and financial markets.[18] In fact, the IMF recently released a report evaluating the impact of the high-stakes disagreement, stating "the latest [trade] escalation could significantly dent business and financial market sentiment, disrupt global supply chains, and jeopardize the projected recovery in global growth in 2019." Moreover, they cite that "consumers in the US and China are unequivocally the losers from trade tensions."[19] This is an important detail considering that consumption represented roughly 68% of GDP in the US and 76% in China in 2018.[20] Disruption to the core driver of aggregate demand in these economies could significantly hamper global growth, potentially producing a domino effect of negative consequences that result in a liquidity squeeze in the future.

While the drawdown appears to be in its very early stages, Bitcoin is getting a jump before these risks are fully reflected in other asset prices. Since Trump first announced the tariff hike, Bitcoin has generated a cumulative return of 47% through May 31, 2019, versus an average of -2% for the others during the same period.

17. Source: BBC. US to review China intellectual property policies. August 19, 2017. https://www.bbc.com/news/business-40982032
18. Source: IMF. IMF DataMapper: GDP, current prices. April 2019. https://www.imf.org/external/datamapper/NGDPD@WEO/OEMDC/ADVEC/WEO/JPN/FRA
19. Source: IMF. IMFBlog: The Impact of US-China Trade Tensions. May 23, 2019. Eugenio Cerutti, Gita Gopinath, Adil Mohommad. https://blogs.imf.org/2019/05/23/the-impact-of-us-china-trade-tensions/
20. Source: Federal Reserve Bank of St. Louis. Shares of gross domestic product: personal consumption expenditures, Q1 2019. https://fred.stlouisfed.org/series/DPCERE1Q156NBEA.
Source: CNBC. Final consumption accounted for 76.2 pct of China's 2018 GDP growth, exports a drag. January 20, 2019. https://www.cnbc.com/2019/01/20/reuters-america-final-consumption-accounted-for-76-point-2-pct-of-chinas-2018-gdp-growth-exports-a-drag.html.

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FIGURE 11: **US-CHINA TRADE TENSION DRAWDOWN**[21]
MAY 5, 2019 – MAY 31, 2019

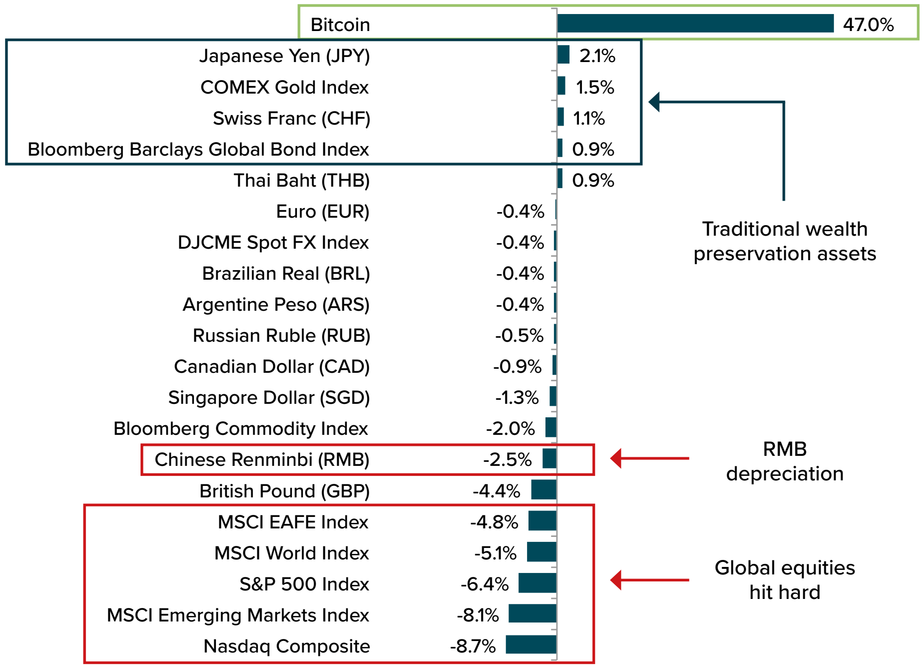
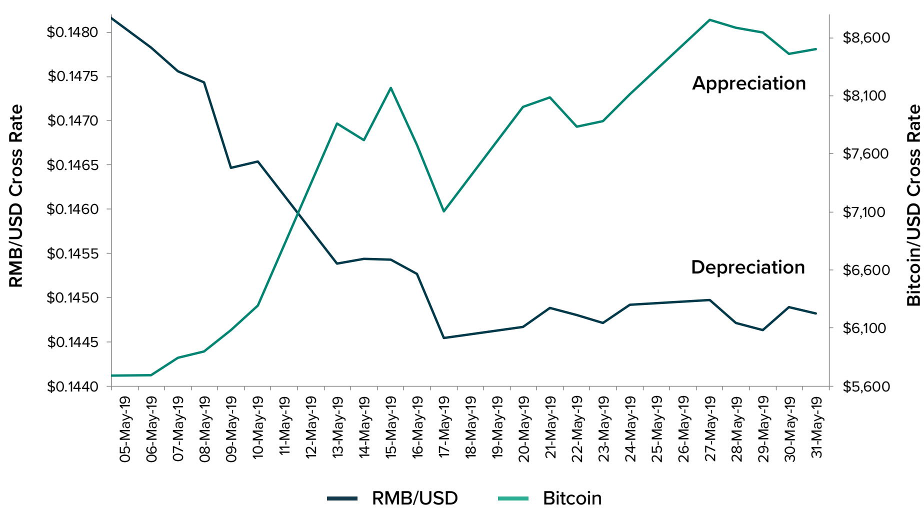


FIGURE 12: **RMB VS. BITCOIN SPOT RATE (USD)**[22]
MAY 5, 2019 – MAY 31, 2019



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

There are significant shifts taking place in monetary, fiscal, and trade 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 politicians and 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.

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, particularly those that result in subsequent currency devaluations. 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 with continued adoption.

We certainly do not hope for the next crisis, but we understand that 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.

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Grayscale Investments is the world's largest digital currency asset manager. With a proven track record and unrivaled experience, we give investors the tools to make informed investing decisions in a burgeoning asset class. As part of Digital Currency Group, Grayscale accesses the world's biggest network of industry intelligence to build better investment products. We have removed the barrier to entry so that institutions and individual investors can benefit from exposure to digital currencies. Now, forward-thinking investors can embrace a digital future within an institutional grade investment.

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Each Product is a private, unregistered investment vehicle and not subject to the same regulatory requirements as exchange traded funds or mutual funds, including the requirement to provide certain periodic and standardized pricing and valuation information to investors. There are substantial risks in investing in a Product or in digital assets directly, including but not limited to:

- **PRICE VOLATILITY**
  Digital assets have historically experienced significant intraday and long-term price swings. In addition, none of the Products currently operates a redemption program and may halt creations from time to time or, in the case of Grayscale Bitcoin Trust (BTC), periodically. There can be no assurance that the value of the common units of fractional undivided beneficial interest ("Shares") of any Product will approximate the value of the digital assets held by such Product and such Shares may trade at a substantial premium over or discount to the value of the digital assets held by such Product. At this time, none of the Products is operating a redemption program and therefore Shares are not redeemable by any Product. Subject to receipt of regulatory approval from the SEC and approval by Grayscale, in its sole discretion, any Product may in the future operate a redemption program. Because none of the Products believes that the SEC would, at this time, entertain an application for the waiver of rules needed in order to operate an ongoing redemption program, none of the Products currently has any intention of seeking regulatory approval from the SEC to operate an ongoing redemption program.

- **MARKET ADOPTION**
  It is possible that digital assets generally or any digital asset in particular will never be broadly adopted by either the retail or commercial marketplace, in which case, one or more digital assets may lose most, if not all, of its value.

- **GOVERNMENT REGULATION**
  The regulatory framework of digital assets 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 digital assets.

- **SECURITY**
  While each Product has implemented security measures for the safe storage of its digital assets, there have been significant incidents of digital asset theft and digital assets remains a potential target for hackers. Digital assets that are lost or stolen cannot be replaced, as transactions are irrevocable.

- **TAX TREATMENT OF VIRTUAL CURRENCY**
  For U.S. federal income tax purposes, Digital Large Cap Fund will be a passive foreign investment company (a "PFIC") and, in certain circumstances, may be a controlled foreign corporation (a "CFC"). Digital Large Cap Fund will make available a PFIC Annual Information Statement that will include information required to permit each eligible shareholder to make a "qualified electing fund" election (a "QEF Election") with respect to Digital Large Cap Fund. Each of the other Products intends to take the position that it is a grantor trust for U.S. federal income tax purposes. Assuming that a Product is properly treated as a grantor trust, Shareholders of that Product generally will be treated as if they directly owned their respective pro rata shares of the underlying assets held in the Product, directly received their respective pro rata shares of the Product's income and directly incurred their respective pro rata shares of the Product 's expenses. Most state and local tax authorities follow U.S. income tax rules in this regard. Prospective investors should discuss the tax consequences of an investment in a Product with their tax advisors.

- **NO SHAREHOLDER CONTROL**
  Grayscale, as sponsor of each Trust and the manager of the Fund, has total authority over the Trusts and the Fund and shareholders' rights are extremely limited.

- **LACK OF LIQUIDITY AND TRANSFER RESTRICTIONS**
  An investment in a Product will be illiquid and there will be significant restrictions on transferring interests in such Product. The Products are not registered with the SEC, any state securities laws, or the U.S. Investment Company Act of 1940, as amended, and the Shares of each Product are being offered in a private placement pursuant to Rule 506(c) under Regulation D of the Securities Act of 1933, as amended (the "Securities Act"). As a result,

the Shares of each Product are restricted Shares and are subject to a one-year holding period in accordance with Rule 144 under the Securities Act. In addition, none of the Products currently operates a redemption program. Because of the one-year holding period and the lack of an ongoing redemption program, Shares should not be purchased by any investor who is not willing and able to bear the risk of investment and lack of liquidity for at least one year. No assurances are given that after the one year holding period, there will be any market for the resale of Shares of any Product, or, if there is such a market, as to the price at such Shares may be sold into such a market.

- **POTENTIAL RELIANCE ON THIRD-PARTY MANAGEMENT; CONFLICTS OF INTEREST**
  The Products and their sponsors or managers and advisors may rely on the trading expertise and experience of third-party sponsors, managers or advisors, the identity of which may not be fully disclosed to investors. The Products and their sponsors or managers and advisors and agents may be subject to various conflicts of interest.

- **FEES AND EXPENSES**
  Each Product's fees and expenses (which may be substantial regardless of any returns on investment) will offset each Product's trading profits.

Additional General Disclosures

Investors must have the financial ability, sophistication/experience and willingness to bear the risks of an investment. This document is intended for those with an in-depth understanding of the high risk nature of investments in digital assets and these investments may not be suitable for you. This document may not be distributed in either excerpts or in its entirety beyond its intended audience and the Products and Grayscale will not be held responsible if this document is used or is distributed beyond its initial recipient or if it is used for any unintended purpose.

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The above summary is not a complete list of the risks and other important disclosures involved in investing in any Product or digital assets and is subject to the more complete disclosures contained in each Product's Offering Documents, which must be reviewed carefully.

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