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Bitcoin & the Rise of Digital Gold

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April 2019[1]

Bitcoin & the Rise of Digital Gold

Over the last decade, Bitcoin has grown from a small-scale experiment into the dominant leader of a new asset class, with a $90 billion market capitalization[2] and the potential to revolutionize many aspects of our lives. Just as the computer and the internet radically transformed the way people store, process, and share information, Bitcoin radically enhances the ways we can store, process, and exchange value.

While gold has historically played a central role in economies driven by physical exchange, the world we live in today is digital. As our money and payment systems evolve, Bitcoin threatens to displace gold as the ultimate store-of-value asset. Our research and experience have reinforced that a steady allocation to Bitcoin, in place of or in addition to gold, may enhance the risk-adjusted returns of traditional investment portfolios.

In this paper, we explore:

- The origins of money
- Why gold was historically "good money"
- Why Bitcoin is better than gold in the Digital Age
- Why we believe now is the time to invest in Bitcoin
- How a strategic allocation to Bitcoin can improve the efficiency of investment portfolios

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1. Originally published July 2016. Updated as of March 31, 2019.
2.Source: Blockchain.info, TradeBlock, inc. As of April 15, 2019. Throughout this paper, when referring to Bitcoin as an investment or a financial network, we use capital "B".

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The Origins of Money

Money is much more than an idea cleverly conceived by ancient philosophers, politicians, or economists. To understand what money truly is, why physical gold has taken the form of money for millennia, and why Bitcoin is poised to radically transform our concepts of money in the 21st century, we must analyze its origins in ancient economies.

Dating back to some of the earliest civilizations, trade has been used as a way for people to satisfy basic human needs. An example of this was ancient Mesopotamia, a region limited in its abundance of natural resources, in which people relied on trade for survival. Over time, proliferation of trade in the region led to the development and expansion of early economies, challenging the efficiency of legacy trade channels (e.g., barter markets) and forcing the evolution towards more sophisticated, monetary systems.
To understand the factors that drove this transition, let's look at a conceptual example of a trade system, with and without a common currency.

Figure 1 shows a pure barter market in which there are four participants: a wheat farmer, a livestock producer, a silk trader and a spice trader. In this market, frictions exist due to constraints on liquidity, access and familiarity. For example, a livestock producer may be willing to trade for wheat, yet the wheat farmer may not have a direct use for livestock. Furthermore, the wheat farmer may have difficulty converting livestock into a useful asset through trade, due to insufficient market knowledge or limited access to trading partners. As a result, the wheat farmer and livestock producer find themselves at an impasse, evidencing friction in the barter system.

FIGURE 1: **BARTER MARKET WITH INHERENT FRICTIONS**

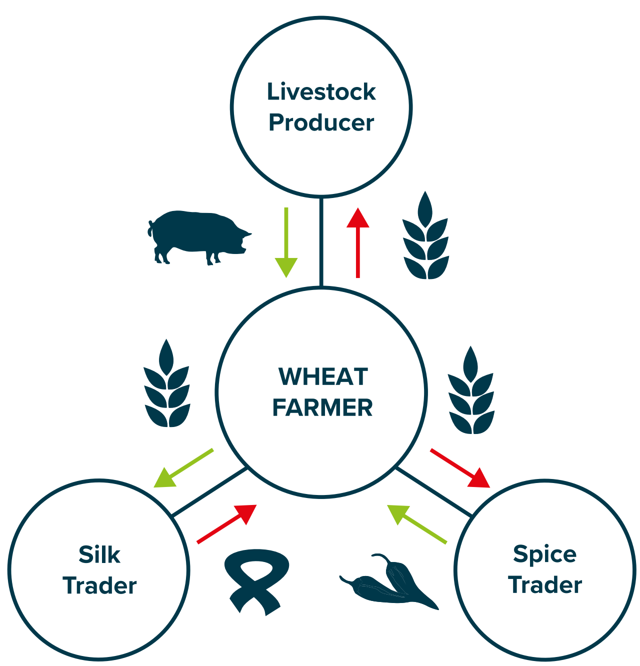

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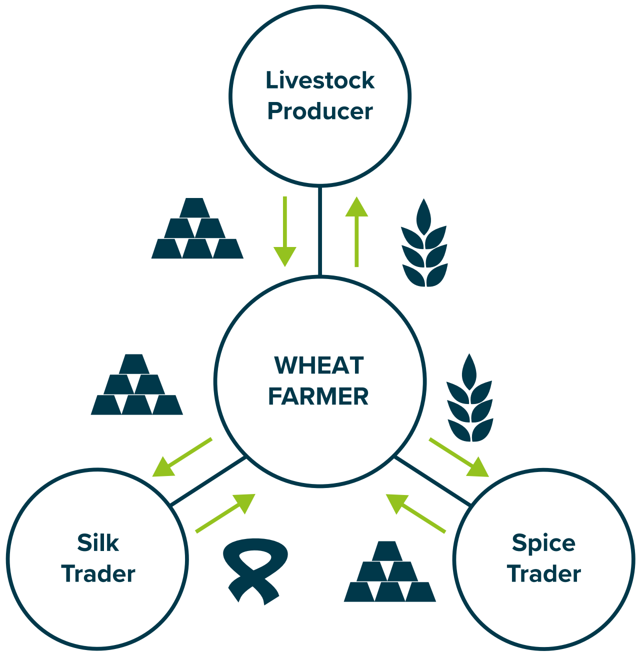
Figure 2 demonstrates how trading with a common currency such as gold, improves upon the barter system. In this example, the wheat farmer is now willing to trade with the livestock producer because she can sell her wheat for gold. The farmer is happy to do so because with a widely accepted currency such as gold, she can redeploy bars or coins as payment for assets that she values, now or in the future.

FIGURE 2: **MONEY MARKET WITH INCREASED EFFICIENCY**



These two trading systems exemplify a timeless and universal characteristic of money. That is, any form of money that gains acceptance has value because:

- *It promotes market efficiency and economic growth*
- *as a mechanism for spending, saving, or both*
- *in ways that existing forms of money cannot*

The "Perfect" Element

For thousands of years, gold has maintained its position as the most widely recognized and successful form of money in the world. Countless nations and currencies have risen and fallen, but gold remains because it possesses the following properties that make it "good money" as store-of-value and medium-of-exchange:

- **Scarcity**: For any asset to be a good store-of-value, it must have a real economic application and be rare or difficult to produce. There is indeed a limited supply of gold in the world. It is estimated that if you were to collect every parcel of gold in the world and melt it down you

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would be left with one 20-meter cube,[3] or just enough to fit in an Olympic-sized swimming pool.

- **Verifiability**: You can verify that physical gold is real by conducting tests of its chemical composition.

- **Durability**: One of the most important aspects of gold is its unique chemical composition, which lends itself as a physical medium-of-exchange and store-of-value. Gold is not reactive, radioactive, or corrosive, nor is it as difficult to distinguish, smelt, or extract as other elements.

- **Portability**: Because gold can be broken down into small parcels, you can physically carry gold around with you in the form of bars or coins, or send it around the world in a car, train, boat or plane.

- **Divisibility**: Gold can be broken down into small parcels because of its chemical composition and malleability, making it possible to transact in different amounts.

- **Fungibility**: Gold has uniform value per unit because each unit is chemically identical. This means that a gold coin weighing a single troy-ounce will be worth the same amount as another gold coin weighing an equal amount.

- **Recognizability**: Gold is recognized as a global monetary asset and is held public and private institutions around the world.

Gold in the 21st Century

In the 21st century, fiat currency has replaced gold as a far more convenient medium-of-exchange. If you don't agree, try purchasing groceries at your local supermarket with gold instead of cash. But to this day, investors still view gold as the ultimate store-of-value hedge against inflation; and for good reason. Throughout history, fiat currencies have been destroyed by hyperinflation, currency wars, imprudent monetary policies and reform, resulting in an average lifespan of roughly thirty years. Policymakers around the world have long demonstrated that they cannot resist printing money when it accommodates them, eroding the purchasing power of local currencies over time.

Gold's lasting role as the ultimate store-of-value asset is rooted in its hard money attributes, particularly scarcity. This is further evidenced by the strong relationship between the supply of "safe haven" currencies like the US dollar and the price of gold. In fact, the investment market for gold has now ballooned to over $3.3 trillion according to the World Gold Council.[4]

3. Source: BBC News, December 2013.
4. Source: World Gold Council. March 2019. Includes physical gold holdings by investors and central banks ($2.9 trillion) and an additional $400 billion in open interest through derivatives traded on exchanges or over-the-counter.

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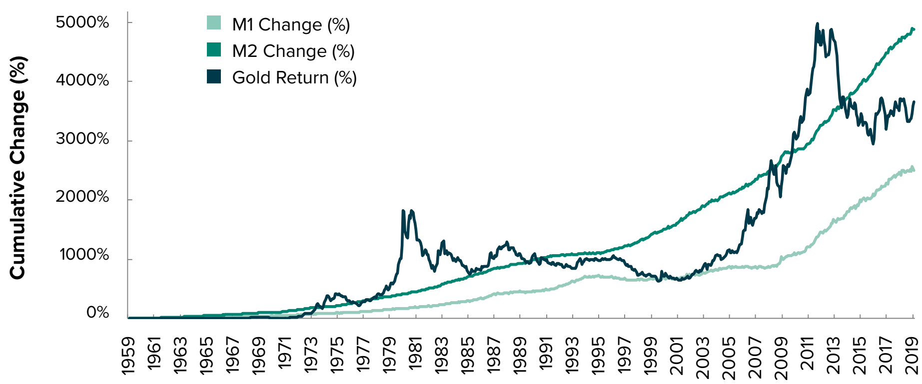
FIGURE 3: **GROWTH IN MONEY SUPPLY VS. GOLD PRICE**[5]



History reinforces that of all the elements naturally existing in the world and all forms of man-made money created, gold possesses the optimal composition of "good money" qualities.

That is, until now...

Gold Good, Bitcoin Better

While gold has historically played a central role in economies driven by physical exchange, the world we live in today is digital. As our money and payment systems evolve, Bitcoin threatens to displace gold as the ultimate monetary asset. That's because Bitcoin possesses a superior composition of "good money" qualities made for a digital global economy:

- **Scarcity**: Like gold, bitcoins are scarce assets. The total supply of bitcoins that will ever enter circulation is limited to 21 million coins. As of April 15, 2019, approximately 17.65 million bitcoins have been issued. It is estimated that the total 21 million supply will be mined by the year 2140.

- **Verifiability**: Bitcoins are unique cryptographic assets[6] that are directly verifiable on the Bitcoin blockchain, in real-time, from anywhere in the world.

5. Source: Federal Reserve Economic Data. Data is shown through March 31, 2019. M1 is a measure of the money supply that includes all physical money, such as coins and currency, as well as demand deposits, checking accounts and Negotiable Order of Withdrawal (NOW) accounts. M1 measures the most liquid components of the money supply, as it contains cash and assets that can quickly be converted to currency. M2 is a measure of money supply that includes cash and checking deposits (M1) as well as near money. "Near money" in M2 includes savings deposits, money market mutual funds and other time deposits, which are less liquid and not as suitable as exchange mediums but can be quickly converted into cash or checking deposits.
6. In computer science, cryptography refers to secure information and communication techniques derived from mathematical concepts and a set of rule-based calculations called algorithms to transform messages in ways that are hard to decipher. These deterministic algorithms are used for cryptographic key generation and digital signing and verification to protect data privacy, web browsing on the internet and confidential communications such as credit card transactions and email. Source: TechTarget Search Security. https://searchsecurity.techtarget.com/definition/cryptography. March 31, 2019.

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- **Durability**: Bitcoins reside on an open-source network maintained by a global base of users. The open-source nature of the Bitcoin protocol has made the network incredibly durable to threats, eliminating single points of failure and allowing for continuous adaptation and improvement. Moreover, users on the network have a shared incentive to make it better.

- **Portability**: With digital transferability, bitcoins are far more portable than gold. Whether via a computer or even the simplest of mobile devices, connectivity to the internet is all that is needed to transact. Bitcoins can be sent quickly and securely, to and from anywhere in the world, in any amount, at low costs, with transparent and verifiable transaction records. So, the 4.7 billion global mobile phone users can already carry, send and receive bitcoins.[7]

- **Divisibility**: All bitcoins are displayed to the eighth decimal place, creating 100 million units within each. The smallest possible unit, a 'satoshi,' represents 0.00000001 of a single bitcoin (or $0.00005121 based on the April 15, 2019 price of $5,121).[8] This feature allows Bitcoin to facilitate digital micro-payments and financing in ways that other forms of money cannot. Imagine a world in which you can send a small fraction of a bitcoin instead of a "like" on Twitter to crowdfund charities, independent projects, or show your appreciation for content with the click of a button.

- **Fungibility**: One bitcoin represents the same exact value as another on the network.

- **Recognizability**: Despite its short history, Bitcoin has achieved global awareness and is now legally permissive in the majority of countries around the world.[9] In the U.S. specifically, Bitcoin is classified as a commodity by the CFTC[10], as a non-security by the SEC[11] and as property by the IRS.[12] Other governments and regulatory bodies around the world have their own legal classifications. Additionally, over 100,000 merchants worldwide now accept bitcoin including Shopify, Overstock.com, Dish, Expedia, PayPal, and Microsoft.[13] Each day Bitcoin continues to exist, it becomes more globally recognized as a real monetary asset.

Bitcoin's superior composition of "good money" qualities make it both a resilient store-of-value and an efficient medium-of-exchange. It is the new and improved "digital gold," perfect for our interconnected, global economy.

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7. Source: Statista. https://www.statista.com/statistics/274774/forecast-of-mobile-phone-users-worldwide/. May 19, 2019.
8. Source: TradeBlock, Inc. As of April 15, 2019.
9. Source: Wikipedia.org. Legality of Bitcoin by Country. https://en.wikipedia.org/wiki/Legality_of_bitcoin_by_country_or_territory. March 31, 2019.
10. Source: Testimony of CFTC Chairman Timothy Massad before the U.S. Senate Committee on Agriculture, Nutrition and Forestry (Dec. 10, 2014). http://www.cftc.gov/PressRoom/SpeechesTestimony/opamassad-6. March 31, 2019.
11. Source: Hearing of SEC Chairman Jay Clayton before the U.S. House Appropriations Committee (Apr. 26, 2018). https://appropriations.house.gov/calendar/eventsingle.aspx?EventID=395258. March 31, 2019.
12. Source: IRS Notice 2014-21, https://www.irs.gov/pub/irs-drop/n-14-21.pdf. March 31, 2019.
13. Source: Due.com. Bitpay. March 31, 2019.

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FIGURE 4: **MONEY MARKET EFFICIENCY COMPARISON: BITCOIN VS. GOLD**

	Bitcoin	Gold
Low cost storage, transferability, and shipping	✓	No
Divisibility permits micro transactions	✓	No
Not easily susceptible to counterfeiting	✓	No
Decentralized	✓	✓
Borderless	✓	✓
Weightless	✓	No
Fast value transfer	✓	No
Easily verifiable	✓	✓
Limited supply	✓	✓
No government freezes or confiscations; limited controls	✓	No
Good for buying a latte	✓	No

Why Now?

Bitcoin is driving global economic growth in new ways while also preserving the store-of-value qualities that provide inflation protection and make it investable. There are three fundamental reasons we believe now is the time to invest:

1. **It's Still Early:** Bitcoin stands to capture value from a spectrum of large and diverse markets. It's value today is only a tiny fraction of the markets it stands to disrupt, which reach well into the trillions of dollars. What if Bitcoin takes even a quarter of the store-of-value market held by gold? What if it becomes the currency of choice for a few of the more unstable nations plagued by hyperinflation? What if it becomes one of the most popular currencies for mobile payments? These are just a few possible use cases.

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FIGURE 5: **DISRUPTION POTENTIAL (USD)**[14]

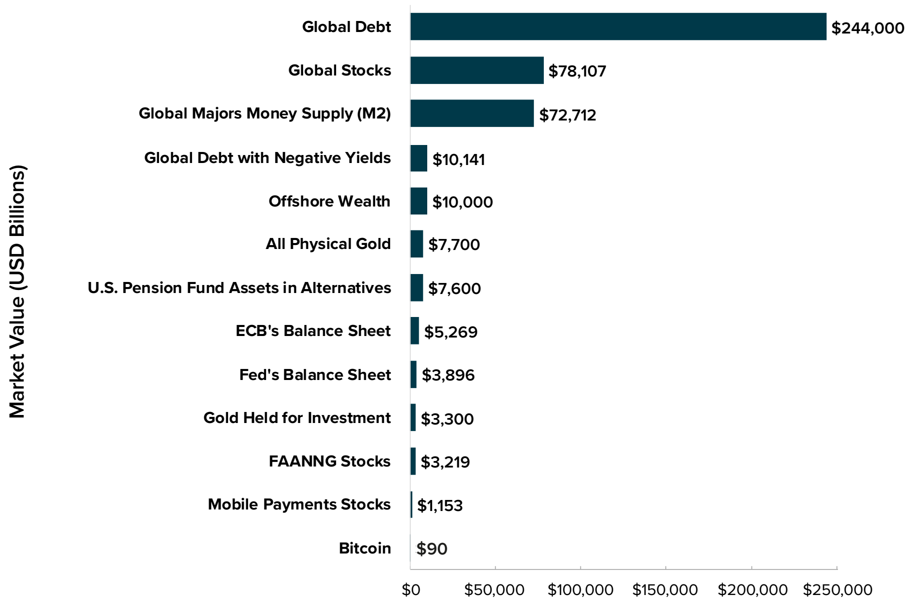
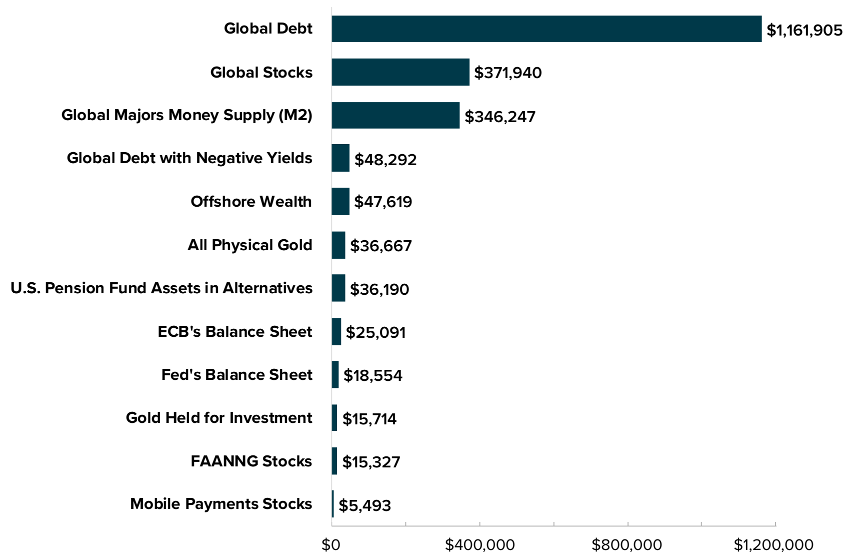


FIGURE 6: **HYPOTHETICAL BITCOIN PRICE AT 10% PENETRATION OF MAJOR MARKETS (USD)**[15]



14. Source: Grayscale, Bloomberg, World Gold Council, CoinMarketCap.com. Market value for Bitcoin as of April 15, 2019. Market value of “Major Markets” as of March 31, 2019.
15. Source: Grayscale. Bloomberg. World Gold Council. “Hypothetical Bitcoin Price” is based on the fully-diluted supply of 21 million bitcoins. THE BITCOIN PRICES SHOWN ARE PURELY HYPOTHETICAL AND SPECIFICALLY ASSUME THAT BITCOIN PRICES WILL INCREASE. Bitcoin has historically experienced significant intraday and long-term price swings. Past performance is not necessarily indicative of future results and the financial projections set forth herein are subject to great uncertainty. There can be no assurance that the projected hypothetical prices will be achieved. Actual future prices will depend on numerous factors, including the future liquidity of Bitcoin, all of which may differ from the assumptions on which the hypothetical prices contained herein are based. NO REPRESENTATION IS BEING MADE THAT ANY RESULTS WILL OR ARE LIKELY TO ACHIEVE PRICES SIMILAR TO THOSE SHOWN.

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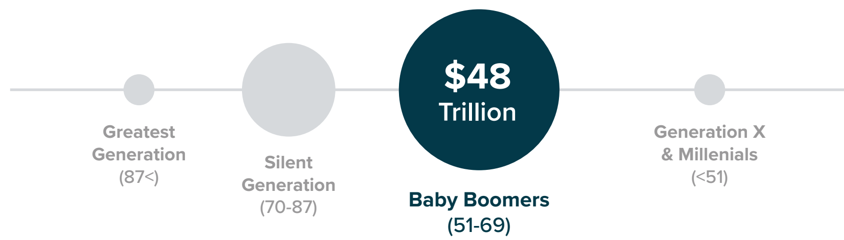
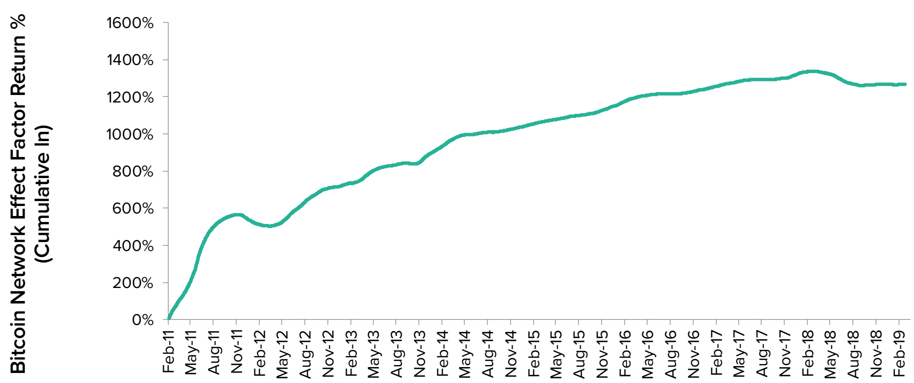
2. **Generational Wealth is on the Move:** With an estimated $68 trillion in generational wealth changing hands over the next 25 years, we may see more investment dollars make their way into uncorrelated assets like Bitcoin. A recent survey[16] from Blockchain Capital shows millennials are much more likely to buy, hold, and use Bitcoin - the majority of which have not even hit their prime earning years yet. As a new generation is evaluating where and how to invest their money, Bitcoin is increasingly part of the mix.[17]

FIGURE 7: **SHIFTING DEMOGRAPHICS OF GENERATIONAL WEALTH**[18]



3. **Network Fundamentals Are Strong:** Through a global transaction network, bitcoins can be sent securely across borders, in any amount, at low costs, as seamlessly as a text message, and without the need for trusted third-parties. As previously noted, over 100,000 merchants worldwide now accept bitcoin.[19] The number of active wallet addresses on the Bitcoin network continues to grow - a key sign of a vibrant and growing financial ecosystem - while the methods for sending, receiving, and storing bitcoins continue to improve at both the consumer and institutional levels.

FIGURE 8: **BITCOIN NETWORK EFFECT FACTOR RETURN % (CUMULATIVE LN)**[20]



16. Source: Blockchain Capital. https://www.survey.blockchain.capital/. Fall 2017. This survey of over 2,000 adults was conducted online within the United States by Harris Poll on behalf of Blockchain Capital from October 18-20, 2017 among 2,112 U.S. adults, ages 18 and older.
17. Source: Cerulli Associates: "The Great Wealth Transfer." *U.S. High-Net-Worth and Ultra-High-Net-Worth Markets 2018: Shifting Demographics of Private Wealth.* November 29, 2018.
18. Source: Cerulli Associates: "The Great Wealth Transfer." U.S. High-Net-Worth and Ultra-High-Net-Worth Markets 2018: Shifting Demographics of Private Wealth. November 29, 2018.
19. Source: Due.com. Bitpay.
20 Source: Grayscale. PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RETURNS.

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An Uncorrelated Asset & the Power of Diversification

Investors today are facing some of the most challenging financial conditions in history. Slowing global growth, high debt burdens, deteriorating effectiveness of monetary policies, low-yielding assets, and a widening wealth gap are all contributing to a savings crisis that threatens the future economic welfare of institutions and individuals around the world. In this challenging environment with significant downside risk, it will be difficult for many investors to achieve their target returns.[21]

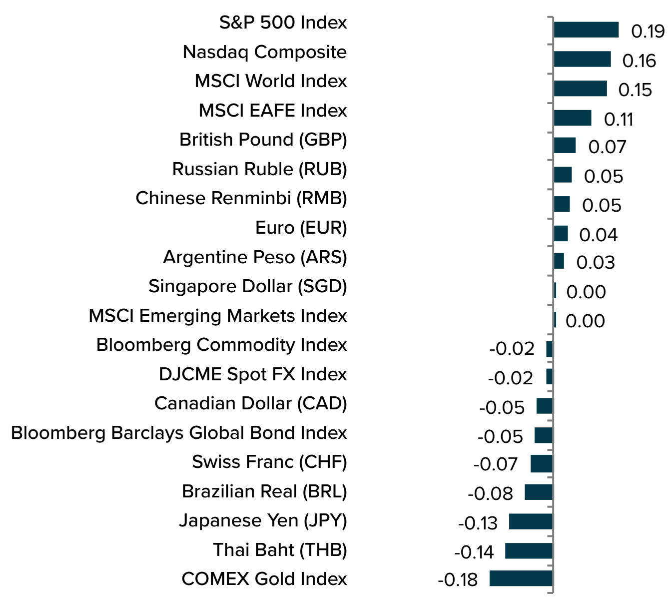
To resolve these challenges, there are two available options:

1. Increase exposure to risky assets already held to generate higher returns - which will mean holding more concentrated, less diversified portfolios, with higher risk of ruin.

2. Identify uncorrelated assets with positive expected returns and use them to build more balanced portfolios.

Because Bitcoin is uncorrelated to other major asset classes and currencies, it represents a unique and innovative way for investors to pursue option two. Practically speaking, this is the better option, since balanced portfolios offer higher returns per unit of risk and increase the likelihood of good investment outcomes, on average.

FIGURE 9: **BITCOIN ROLLING ONE-MONTH CORRELATIONS**[22]
September 25, 2013 through March 31, 2019



21. Source: AQR: "The 5% Solution." May 1, 2012. Cliff Asness, Antti Ilmanen. https://www.aqr.com/Insights/Research/Trade-Publication/The-5-Percent-Solution.
22. Source: Bloomberg, CoinMarketCap.com. Data is shown from September 25, 2013 through March 31, 2019. PAST RESULTS ARE NOT INDICATIVE OF FUTURE PERFORMANCE.

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To gain a deeper understanding of the role that Bitcoin might play in a portfolio, we conducted a series of simulations and analyzed the impact that different sized allocations could have on the performance and risk profile of traditional investments.

In the first example, we looked at how the SPDR® Gold Shares would have performed versus a portfolio that is comprised of an 85% allocation to the SPDR® Gold Shares and a 15% allocation to Bitcoin. We think this is an interesting comparison because:

1. Bitcoin shares common store-of-value properties with gold that fundamentally support its role as a hedge against extreme market dislocations and unexpected or prolonged periods of inflation.

2. While both Bitcoin and gold may be considered inflation-hedging assets, each have unique characteristics that are diversifying. For example, Bitcoin may perform well in global growth cycles as thematic investments are made in new, yet risky, technologies. On the other hand, gold may not perform well during such cycles.

3. It can provide insight as to whether a combined investment in Bitcoin and gold might deliver better risk-adjusted returns than a standalone investment in gold.

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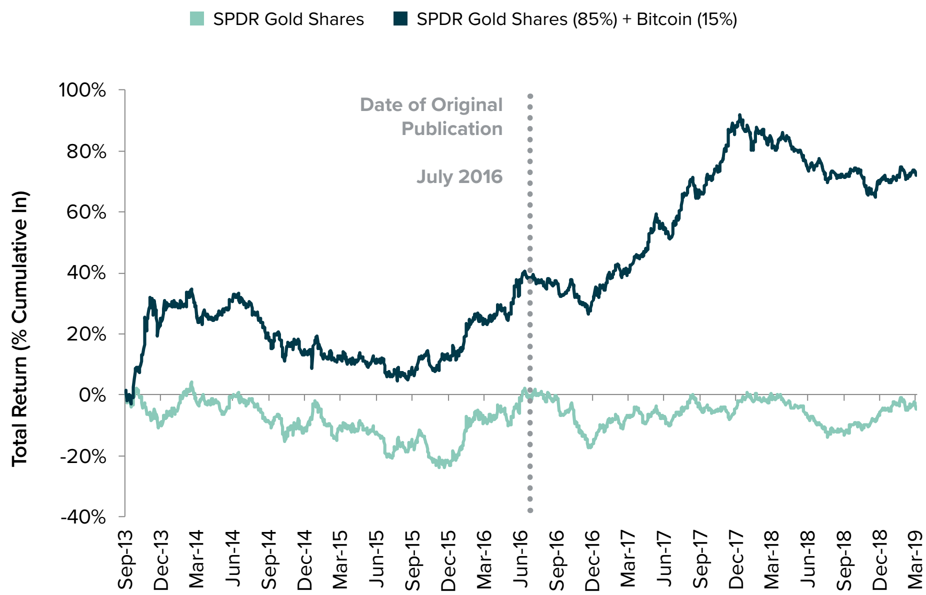
FIGURE 10: **HYPOTHETICAL SIMULATED PORTFOLIO PERFORMANCE**[23]
September 25, 2013 through March 31, 2019

PORTFOLIO	SPDR Gold Shares	SPDR Gold Shares (85%) + Bitcoin (15%)
Cumulative Total Return (%)	-4.5%	105.9%
Annualized Total Return (%)	-0.8%	14.2%
Annualized Risk (% Std Dev)	13.5%	16.9%
Sharpe Ratio	-0.11	0.81
Change in Annualized Return (%)	--	**15.1%**
Change in Annualized Risk (%)	--	**3.4%**



As the previous chart shows, the blended portfolio (blue) produced an annualized return that was more than 15% higher than that of a pure gold portfolio (green), without materially increasing volatility. While many investors already know that maintaining a steady allocation to gold can provide diversification benefits, shifting part of their gold investment into Bitcoin could further improve performance per unit of risk.

23. Source: Bloomberg. CoinMarketCap.com. Performance is shown from September 25, 2013 through March 31, 2019. Annualized figures are based on 252 trading days. Return attribution is based on the excess returns of the hypothetical simulated portfolios including Bitcoin as compared to the SPDR® Gold Shares. Performance of Bitcoin is based on the daily values from CoinMarketCap.com. THE SPDR® GOLD SHARES (85%) + BITCOIN (15%) RESULTS ARE HYPOTHETICAL AND ARE NOT BASED ON ACTUAL RETURNS OR HISTORICAL PERFORMANCE. BITCOIN HAS HISTORICALLY EXPERIENCED SIGNFICANT INTRADAY AND LONG-TERM PRICE SWINGS AND PAST PERFORMANCE IS NOT NECESSARILY INDICATIVE OF FUTURE RESULTS. Component asset weights are held constant over the period. The Sharpe Ratio is calculated as the annualized excess return of the portfolio over the 3-month U.S. Treasury Bill divided by the standard deviation of excess returns. This paper was originally published in July 2016 but has been updated to account for recent developments and to reflect our latest thinking.

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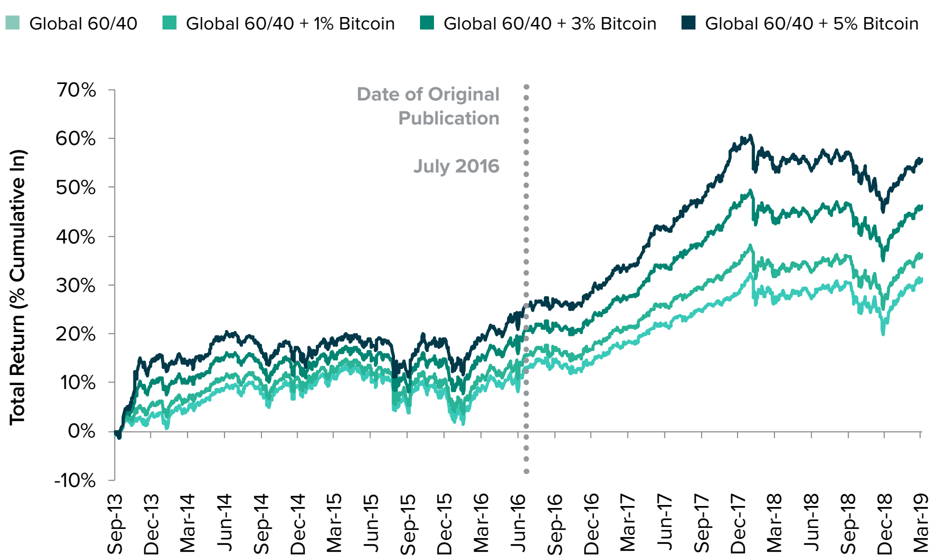
For this reason alone, we could see a portion of the assets that are currently invested in gold move into Bitcoin. If Bitcoin were to capture just 15% of the $3.3 trillion investment market for gold over the next 10 years, that would give Bitcoin a market capitalization of approximately $495 billion and a price of more than $24,200 per coin. Moreover, if Bitcoin were to capture half of the current gold allocation in investment portfolios, the price of a bitcoin could reach upwards of $80,000 per coin.

In the second example, we looked at the incremental effects of adding different sized allocations of Bitcoin (1% to 5%) to portfolio comprised of 60% global equities and 40% global bonds (the "Global 60/40").

FIGURE 11: **HYPOTHETICAL SIMULATED PORTFOLIO PERFORMANCE**[24]
September 25, 2013 through March 31, 2019

PORTFOLIO	Global 60/40	Global 60/40 +1% Bitcoin	Global 60/40 +3% Bitcoin	Global 60/40 +5% Bitcoin
Cumulative Total Return (%)	36.7%	43.7%	58.6%	74.7%
Annualized Total Return (%)	5.9%	6.9%	8.8%	10.8%
Annualized Risk (% Std Dev)	7.7%	7.7%	8.0%	8.5%
Sharpe Ratio	0.68	0.81	1.03	1.19
Change in Annualized Return (%)	--	**0.97%**	**2.92%**	**4.88%**
Change in Annualized Risk (%)	--	**-0.02%**	**0.21%**	**0.78%**
Ratio Improvement	--	**19%**	**52%**	**75%**



24. Source: Bloomberg, CoinMarketCap.com. Performance is shown from September 25, 2013 through March 31, 2019. Annualized figures are based on 252 trading days. "Global 60/40" consists of a 60% allocation to the iShares MSCI ACWI and a 40% allocation to the Vanguard Total International Bond ETF. Return attribution is based on the excess returns of the hypothetical simulated portfolios including Bitcoin as compared to the "Global 60/40". Performance of Bitcoin is based on the daily values from CoinMarketCap.com. THE GLOBAL 60/40 + 1%/3%/5% BITCOIN RESULTS ARE HYPOTHETICAL AND ARE NOT BASED ON ACTUAL RETURNS OR HISTORICAL PERFORMANCE. BITCOIN HAS HISTORICALLY EXPERIENCED SIGNFICANT INTRADAY AND LONG-TERM PRICE SWINGS AND PAST PERFORMANCE IS NOT NECESSARILY INDICATIVE OF FUTURE RESULTS. Component asset weights are held constant over the period. The Sharpe Ratio is calculated as the annualized excess return of the portfolio over the 3-month US T-Bill divided by the standard deviation of excess returns. Ratio improvement is calculated by taking the Sharpe Ratio of the Global 60/40 + 1%/3%/5% Bitcoin Portfolios and dividing each by the Sharpe Ratio of the Global 60/40 Portfolio. This paper was originally published in July 2016 but has been updated to account for recent developments and to reflect our latest thinking.

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Our analysis revealed that even small allocations to Bitcoin can significantly enhance the returns of traditional portfolios like the Global 60/40, without any material impact on portfolio volatility. For example:

- Allocating 1% Bitcoin to the Global 60/40 increased annual returns by 97 bps, reduced volatility by 2 bps, and improved the return-to-risk ratio by 19%.

- Allocating 3% Bitcoin to the Global 60/40 increased annual returns by 292 bps, increased volatility by 21 bps, and improved the return-to-risk ratio by 52%.

- Allocating 5% Bitcoin to the Global 60/40 increased annual returns by 488 bps, increased volatility by 78 bps, and improved the return-to-risk ratio by 75%.

Because Bitcoin may offer return-enhancing, and even risk-reducing potential, when added to both safe-haven allocations and traditional investment portfolios, we believe there is a compelling case for investors to have at least a small part of their portfolios allocated to this asset.

Conclusion

The introduction of Bitcoin in 2009 marked a paradigm shift in the evolution of our global financial infrastructure, monetary systems, and the economic opportunities afforded by them. After all, Bitcoin represents the first currency that can be sent across borders at the speed of information, void of trusted intermediaries, and with complete security and reliability. It is also the first successful demonstration that economic properties once unique to physical assets, like gold, can be reflected by digital assets and adopted by the world.

It's important to remember that any form of money that gains acceptance, has value because:

- *It promotes market efficiency and economic growth*
- *as a mechanism for spending, saving, or both*
- *in ways that existing forms of money cannot*

Our digital world demands digital gold, and we believe Bitcoin is the answer.

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About Grayscale Investments

Grayscale Investments, LLC ("Grayscale") 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 digital currency intelligence to build better investment products. We have removed the barrier to entry so that institutions and 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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The Products are private investment vehicles. Shares of Grayscale Bitcoin Trust (BTC), which are only offered on a periodic basis, are publicly quoted under the symbol: GBTC. The Products are 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. The Products are not registered with the Securities and Exchange Commission (the "SEC"), any state securities laws, or the U.S. Investment Company Act of 1940, as amended. There are substantial risks in investing in one or more Products. Any interests in each Product described herein have not been recommended by any U.S. federal or state, or non-U.S., securities commission or regulatory authority, including the SEC. Furthermore, the foregoing authorities have not confirmed the accuracy or determined the adequacy of this document. Any representation to the contrary is a criminal offense.

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Note On Hypothetical Simulated Performance Results

HYPOTHETICAL SIMULATED PERFORMANCE RESULTS HAVE CERTAIN INHERENT LIMITATIONS. There is no guarantee that the market conditions during the past period will be present in the future. Rather, it is most likely that the future market conditions will differ significantly from those of this past period, which could have a materially adverse impact on future returns. 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 PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

The hypothetical simulated performance results are based on a model that used inputs that are based on assumptions about a variety of conditions and events and provides hypothetical not actual results. As with all mathematical models, results may vary significantly depending upon the value of the inputs given, so that a relatively minor modification of any assumption may have a significant impact on the result. Among other things, the hypothetical simulated performance calculations do not take into account all aspects of the applicable asset's characteristics under certain conditions, including characteristics that can have a significant impact on the results. Further, in evaluating the hypothetical simulated performance results herein, each prospective investor should understand that not all of the hypothetical assumptions used in the model are described herein, and conditions and events that are not accounted for by the model may have a significant adverse effect on the performance of the assets described herein. Prospective investors should consider whether the behavior of these assets should be tested based on different and/or additional assumptions from those included in the information herein.

IN ADDITION TO OTHER DIFFERENCES, PROSPECTIVE INVESTORS IN A PRODUCT SHOULD NOTE THE FOLLOWING POTENTIALLY SIGNIFICANT DIFFERENCES BETWEEN THE ASSUMPTIONS MADE IN THE HYPOTHETICAL SIMULATED PERFORMANCE RESULTS INCLUDED HEREIN AND THE CONDITIONS UNDER WHICH A PRODUCT WILL PERFORM, WHICH COULD CAUSE THE ACTUAL RETURN OF SUCH PRODUCT TO DIFFER CONSIDERABLY FROM RETURNS SET FORTH BY THE HYPOTHETICAL SIMULATED PERFORMANCE, TO BE MATERIALLY LOWER THAN THE RETURNS AND TO RESULT IN LOSSES OF SOME OR ALL OF THE INVESTMENT BY PROSPECTIVE INVESTORS:

FOR EXAMPLE, EACH TRUST WILL HOLD ONLY ONE DIGITAL ASSET, WHEREAS THE HYPOTHETICAL SIMULATED PERFORMANCE RESULTS ARE INTENDED TO SHOW HYPOTHETICAL PERFORMANCE OF AN INVESTMENT MULTIPLE DIGITAL ASSETS. IN ADDITION, THE GENERAL MARKET DATA USED IN THE HYPOTHETICAL SIMULATED PERFORMANCE RESULTS DO NOT REFLECT ACTUAL TRADING ACTIVITY AND COULD NOT BE REPLICATED BY A PRODUCT IN ITS ACTUAL TRANSACTIONS. If actual trading activity was executed at levels that differed significantly from the general market data used in the hypothetical simulated performance, the actual returns achieved would have varied considerably from the results of the hypothetical simulated performances and could have been substantially lower and could result in significant losses.

IN ADDITION, THE HYPOTHETICAL SIMULATED PERFORMANCE RESULTS DO NOT ASSUME ANY GAINS OR LOSSES FROM TRADING AND THEREFORE DO NOT REFLECT THE POTENTIAL LOSSES, COSTS AND RISKS POSED BY TRADING AND HOLDING ACTUAL ASSETS.

The hypothetical simulated performance results do not reflect the impact the market conditions may have had upon a Product were it in existence during the historical period selected. The hypothetical simulated performance results do not reflect any fees incurred by a Product. If such amounts had been included in the hypothetical simulated performance, the results would have been lowered.

AS A RESULT OF THESE AND OTHER DIFFERENCES, THE ACTUAL RETURNS OF A PRODUCT MAY BE HIGHER OR LOWER THAN THE RETURNS SET FORTH IN THE HYPOTHETICAL SIMULATED PERFORMANCE RESULTS, WHICH ARE HYPOTHETICAL AND MAY NEVER BE ACHIEVED. Reasons for a deviation may also include, but are by no means limited to, changes in regulatory and/or tax law, generally unfavorable market conditions and the Risk Factors set forth below.

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Certain Risk Factors

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,

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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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