Grayscale Research | Matthew Beck, CFA | July 2016

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Bitcoin & the Rise of Digital Gold

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Over the last eight years, bitcoin has grown from a small scale experiment into an asset with a $10+ billion market capitalization and the potential to revolutionize nearly every aspect of our lives. Just as the computer and the internet radically transformed the way people store, process, and share information, bitcoin dramatically enhances the way people store, process, and exchange value.

In the digital era, bitcoin threatens to supplant gold as the ultimate monetary asset. Our research reinforces that a steady allocation to bitcoin, in place of or in addition to gold, could 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 money
- How a strategic allocation to bitcoin can improve the efficiency of investor portfolios

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 trade and barter economies.

Trade has always been used to satisfy peoples' basic physiological, safety and security needs. This was never more profound than in ancient Mesopotamia, a region limited in its abundance of natural resources. Over time, proliferation of trade in the region led to the expansion of early economies. As civilizations increased in complexity, so did their barter systems. New layers of complexity challenged legacy trade channels, forcing the evolution towards more sophisticated, monetary systems.

In order 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 market liquidity, access and familiarity. For example, the livestock producer may be willing to trade for wheat; however, 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**

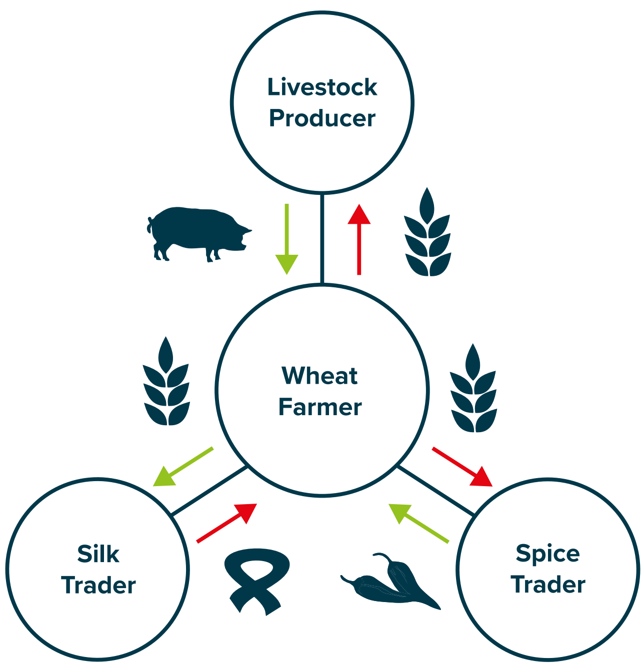
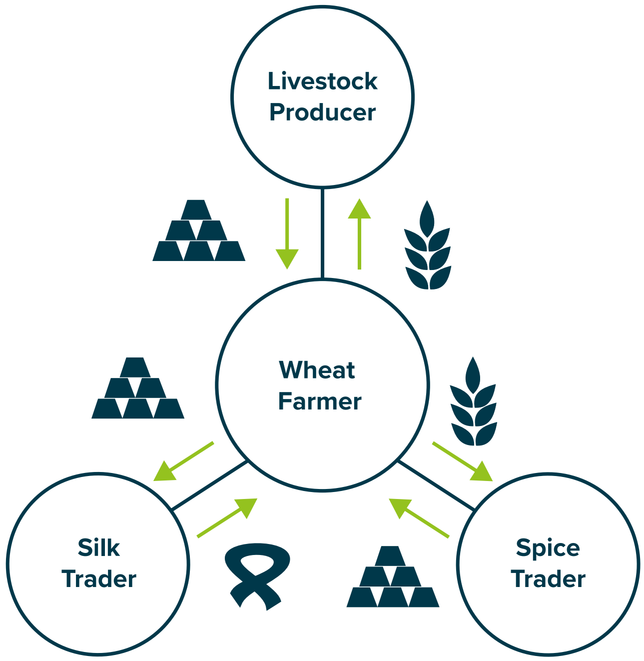


Figure 2 demonstrates how trading with a common currency such as gold, improves upon the barter system. In this example, the wheat farmer is now willing to trade with the livestock producer because he can sell his wheat for gold. The farmer is happy to do so because with a widely accepted currency such as gold, he can redeploy bars or coins as payment to other merchants for assets that he 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 increases market efficiency and promotes economic growth.*

The "Perfect" Element

For over 10,000 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 seven properties that make it good money as store of value, medium of exchange, and unit of account:

- **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. It is not reactive, radioactive, or corrosive, nor is it as difficult to distinguish, smelt, or extract as other elements.

- **Scarcity**: In order 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 would be left with one 20-metre cube.[1]

1. Source: BBC News, December 2013.

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

- **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.

- **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 the same amount.

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

- **Recognizability**: Gold is recognized as an asset by public and private institutions around the world.

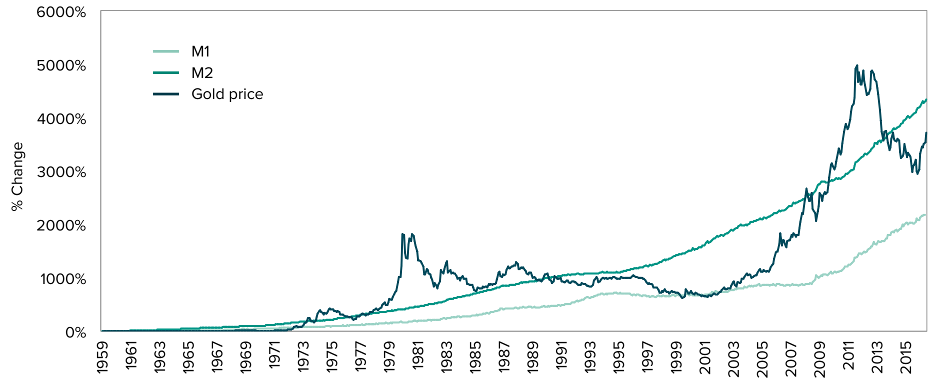
Gold in the 21st Century

In the 21st century, fiat currency has replaced gold as a far more convenient medium of exchange and unit of account. 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 the hubris of governments enacting monetary policies; and for good reason. Throughout history, fiat currencies have been brutalized by hyperinflation, war, and monetary reform, resulting in an average life of roughly 30 years. Policymakers around the world have long demonstrated that they cannot resist printing money when it accommodates them.

Gold's lasting role as the ultimate monetary asset and store of value is rooted in its scarcity. This is further evidenced by the strong relationship between the money supply of "safe haven" currencies like the US dollar and the price of gold. In fact, the financial market for gold has now ballooned to over $2.6 trillion according to the World Gold Council.[2]

2.Source: World Gold Council, December 2013.

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



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

In 2008, the inventor of bitcoin, Satoshi Nakamoto, published a whitepaper detailing a peer-to-peer electronic transaction network powered by a digital asset known as bitcoin, in which exchange between users could occur without the need for trusted intermediaries. Transactions would be recorded electronically on a public, distributed ledger (known as a blockchain), on which bitcoin serves as the unit of account. In 2009, the system was released as open source code, allowing participants, or "nodes", on the bitcoin network to contribute to the evolution of the protocol through a democratic process.

While gold has played a central role in economies driven by physical exchange, the world we live in today is increasingly digital. Digitization has produced new layers of complexity in the channels of global exchange that are challenging existing transaction infrastructure, stimulating the next wave in the evolution of money. In the digital era, bitcoin threatens to displace gold as the ultimate monetary asset because:

3. Source: Federal Reserve Economic Data. Data is shown through June 30, 2016. 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.

1. Bitcoin possesses a superior composition of "good money" qualities as a durable store of value and efficient medium of exchange.

- **Durability**: Bitcoin is more durable than gold in that it exists and is retained on a decentralized network. The open-source nature of the bitcoin protocol allows for continuous adaptation and improvement. Open-source networks are, in principle, more secure and reliable since there is no single point of failure and everyone has a shared incentive to make it better; similar to internet protocols like email and http. The resilience of the bitcoin network lends to the durability of the digital currency/commodity that comprises it.

- **Scarcity**: Like gold, bitcoin is a scarce asset. The overall supply of bitcoin that will ever enter circulation is limited to 21 million. This is an explicit design element of the bitcoin protocol. As of June 30, 2016, there are approximately 15.7 million bitcoin floating in the market. It is estimated that the total 21 million supply of bitcoin will be mined by the year 2140.

- **Divisibility**: Bitcoin is the most divisible form of payment available in the world. The smallest possible unit, a 'satoshi,' represents 0.00000001 of a single bitcoin (or $0.0000066 based on current bitcoin prices in the $660 range). All bitcoin are displayed to the eighth decimal place, creating 100 million units within each bitcoin. This facilitates electronic micropayments and microfinancing 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 Facebook to crowdfund charities or independent projects with the click of a button.

- **Portability**: Bitcoin exists in the 'cloud', making it much more portable than gold or fiat currency. In the mobile era, connectivity via a mobile device or the internet is all that is required to deal in bitcoin. It is estimated that there will be 28 billion connected devices in 5 years' time.[4] That is nearly 4x the global population. Practically every person in the world will be able to send and receive bitcoin from a mobile device, as easily as a text message.

- **Fungibility**: One unit of bitcoin represents the same exact value as another unit of equal size.

- **Verifiability**: Bitcoins are unique cryptographic tokens that are directly verifiable on the bitcoin blockchain, in real-time, from anywhere in the world. The blockchain is an electronic, globally distributed transaction ledger that is powered by the computers of bitcoin miners. Miners computationally verify transactions in order to earn economic rewards in the form of bitcoin, supporting the speed and viability of the network.

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4. Source: Ericsson Mobility Report: June 2016.

- **Recognizability**: According to Bitlegal.io, a provider of information on the legal status of bitcoin in different countries, nearly 85% of the 74 countries in their index recognize and permit use of bitcoin. In the US, bitcoin is recognized as a commodity by the CFTC and as property by the IRS. Other governments and regulatory bodies around the world have their own legal classifications for bitcoin.[5]

2. Bitcoin is increasing market efficiency in ways that gold and other forms of money cannot via its high speed, global transaction network and blockchain.

Bitcoin can be sent:

- In any amount (0.00000001 or 1 million bitcoin)
- From anywhere in the world
- To anywhere in the world
- As seamlessly as sending a text message or an email
- Instantly
- Securely
- At low costs
- With transparent and verifiable transactions that are permanently retained on the blockchain

Below we assess bitcoin and gold along a variety of market efficiency dimensions to see how they stack up:

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

5. Source: bitlegal.io, June 2016.

Bitcoin shows clear advantages over gold in terms of storage cost, divisibil-ity, transfer speed, and acceptance in commercial transactions. Today, over 100,000 merchants worldwide now accept bitcoin including Uber, Over-stock.com, Expedia, PayPal, Dell, and Microsoft to name a few.

Many believe that the bitcoin blockchain will enable a vastly cheaper and more secure way to transfer assets (i.e. securities settlement, real estate, media, and more) between independent counterparties. Assets can be em-bedded directly in the blockchain by "tagging" them with a fraction of bitcoin, eliminating the need for central clearing authorities to certify ownership since every transaction on the blockchain has a permanent public record. Taking this concept a step further, some have estimated that the market for financial blockchain applications could ultimately measure in trillions of U.S. dollars[6] as bitcoin technology revolutionizes the $700 trillion global derivatives market.[7]

Others think bitcoin will enable financial inclusion for the estimated 2 billion working-age adults without access to basic financial services[8]; services that are essential to satisfy basic physiological, safety, and security needs in the 21st century. This staggering figure represents more than half of the total adult population in the world. Bitcoin and its network driven services can facilitate financial inclusion through:

- Fast, secure, and affordable cross-border payments.
- Transparent, secure, and affordable title transfers.
- Accessible and affordable financing for microenterprises and small business projects.
- Cash flow management for basic living, educational and medical expenses.
- Affordable and secure wealth storage.

Goldman Sachs recently released a report describing how blockchain technology is transitioning from a theoretical concept to a practical solution to real-world problems. In the report, they highlight a number of blockchain applications across the lodging, utility, title insurance, banking, and anti-money laundering industries. They estimate that approximately $22B – $37 billion will flow into newly created markets or be redistributed across existing markets over the next few years.[9]

Regardless of which market segments you think will be impacted most, it is clear that bitcoin offers tremendous potential across almost every sector as an efficient and practical store of value, medium of exchange, and unit of account in our interconnected, global economy.

6. Why financial firms are investigating bitcoin tech, CNBC, June 2015.
7. Bitcoin technology offers clarity for derivatives, The Times UK, February 2015.
8. Source: Consultative Group to Assist the Poor (CGAP), June 2016.
9. Source: Goldman Sachs, Profiles in Innovation: Blockchain, Putting Theory into Practice, May 24, 2016.

The Power of Diversification

As bitcoin promotes economic growth in new and innovative ways, it represents a unique investment opportunity for those seeking to build more efficient portfolios.

Investors today are facing some of the most challenging financial conditions in history. Slow global growth, secular-high debt burdens, deteriorating effectiveness of monetary policies, and low-yielding assets are all contributing to a savings crisis that threatens the economic welfare of institutions and individuals around the world.

Global bond yields are at their lowest levels in recorded history, led by the $11.7 trillion in negative rate sovereign debt outstanding.[10] At the same time, the Shiller P/E on the S&P 500 has reached heights only seen prior to the Great Depression, the Dot-Com Bubble, and the Great Recession. Brexit portends the disintegration of the European Union and China is delicately working to rebalance its economy from one driven by credit-fueled investment to consumption. In this low-return environment with significant downside risk, it will be difficult for many investors to achieve their target returns.

There are two options available to them. They can either:

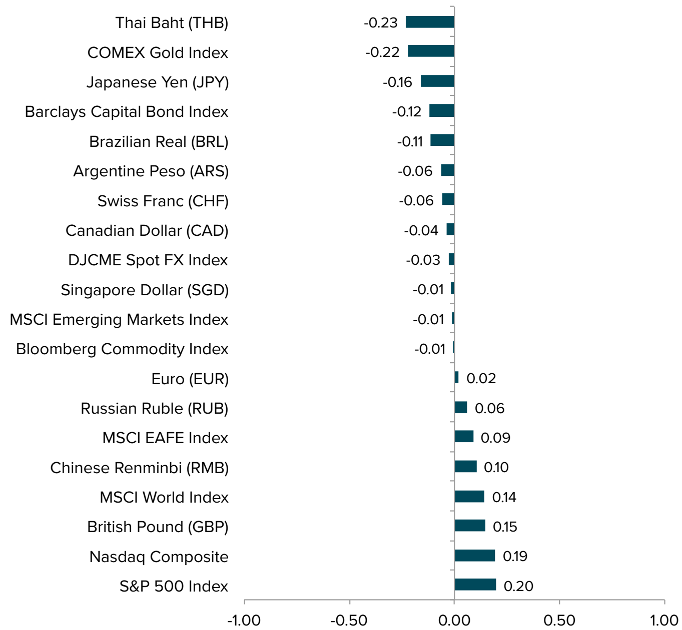
1. Increase exposure to risky assets already held in their portfolios in hopes of generating higher returns. However, this will mean holding more concentrated, less diversified portfolios, with higher risk of ruin.

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

As a distinct, uncorrelated asset, bitcoin provides investors with the potential to overcome economic headwinds and achieve their investment goals. Over the last three years, bitcoin has had an average cross-sectional correlation of zero with the major asset classes and investment themes below.

10. Source: Fitch Ratings, June 27, 2016.

FIGURE 4: **BITCOIN ROLLING ONE MONTH CORRELATIONS**[11]
June 30, 2013 - June 30, 2016



To gain a deeper understanding of the diversification benefits that bitcoin can offer, we ran a series of portfolio 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 Trust would have performed versus a portfolio that is comprised of a 95% allocation to the SPDR Gold Trust and a 5% allocation to bitcoin. We think this is an interesting comparison because:

1. Bitcoin shares common properties with gold (durability, scarcity, fungibility, divisibility, portability, verifiability, and recognizability) that fundamentally support its role as a safe haven asset and inflation hedge in extreme economic environments.

2. While both bitcoin and gold may be considered safe haven assets, each has unique characteristics that are diversifying. For example, bitcoin might perform well in growth cycles as companies invest in innovative ventures and new technologies, whereas gold may not perform well during such periods.

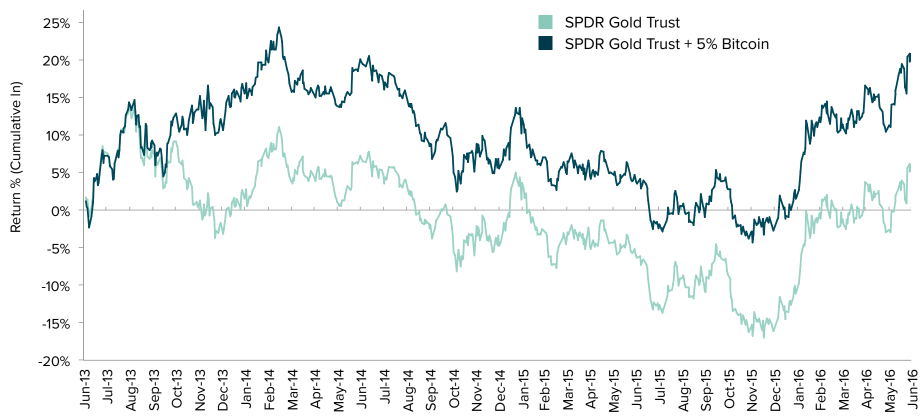
3. It can provide insight as to whether a combined investment in bitcoin and gold might deliver better risk-adjusted returns than a standalone investment in gold.

11. Data is shown from June 30, 2013 through June 30, 2016. Correlations are calculated based on the daily values of the Bloomberg Bitcoin Price Index (USD). PAST RESULTS ARE NOT INDICATIVE OF FUTURE PERFORMANCE.

FIGURE 5: **HYPOTHETICAL SIMULATED PORTFOLIO PERFORMANCE**
June 30, 2013 through June 30, 2016.

PORTFOLIO	SPDR Gold Trust	SPDR Gold Trust + 5% Bitcoin
Cumulative Total Return	6.2%	23.5%
Annualized Total Return	2.0%	7.3%
Annualized Std Dev	16.3%	16.0%
Sharpe Ratio	0.13	0.46
Change in Annualized Return	--	**5.3%**
Change in Annualized Risk	--	**-0.3%**

FIGURE 6: **HYPOTHETICAL SIMULATED PORTFOLIO PERFORMANCE**[12]
Cumulative (ln)



As the chart above shows, the blended portfolio (blue) produced an annualized return that was over *5% higher* than that of a pure gold portfolio (green), with lower volatility. While many investors already know that maintaining a steady allocation to gold can provide diversification benefits, shifting a portion of their gold investment into bitcoin could improve portfolio performance even more, while also reducing risk.

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 5% of the $2.6 trillion financial market for gold over the next 10 years, that would give bitcoin a market capitalization of approximately $130 billion and a price of more than $6,800 per coin. That translates into an average annualized return of over 25% based on current prices in the $660 range.[13] Moreover, if bitcoin were to completely displace gold as a safe haven asset in investment portfolios, the price of bitcoin could reach upwards of $100,000 per coin.

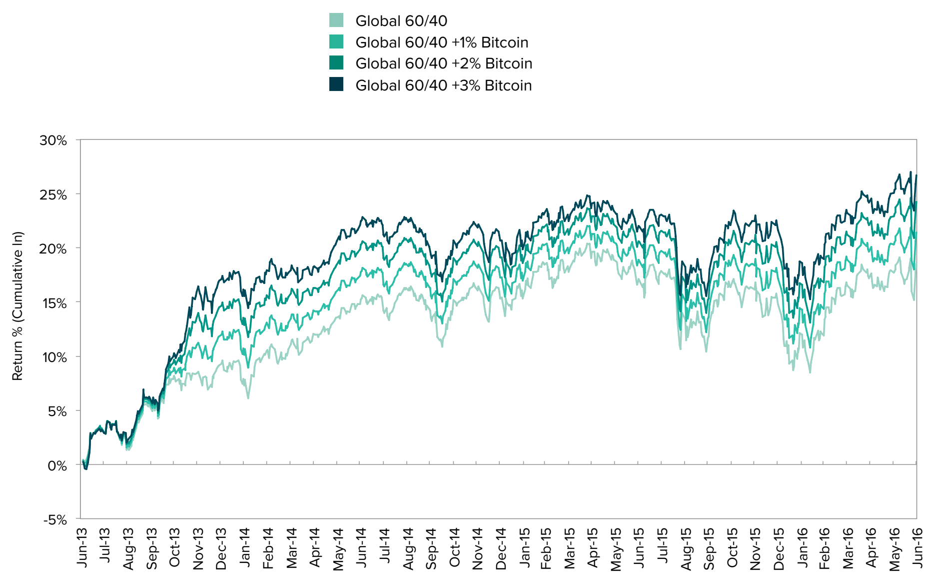
12. Performance is shown from June 30, 2013 through June 30, 2016. Performance of bitcoin is based on the daily values of the Bloomberg Bitcoin Price Index (USD). WHERE SHOWN, HYPOTHETICAL OR SIMULATED PERFORMANCE RESULTS HAVE CERTAIN INHERENT LIMITATIONS. UNLIKE AN ACTUAL PERFORMANCE RECORD, SIMULATED 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.
13. Based on an estimated supply of 19 million bitcoin in 2026.

In the second example, we looked at the incremental effects of adding different sized allocations of bitcoin (1% to 3%) to a portfolio of global equities and bonds (the "Global 60/40").

FIGURE 8: **HYPOTHETICAL SIMULATED PORTFOLIO PERFORMANCE**
June 30, 2013 through June 30, 2016.

PORTFOLIO	Global 60/40	Global 60/40 +1% Bitcoin	Global 60/40 +2% Bitcoin	Global 60/40 +3% Bitcoin
Cumulative Total Return	20.4%	24.0%	27.6%	31.3%
Annualized Total Return	6.4%	7.4%	8.5%	9.5%
Annualized Std Dev	8.4%	8.4%	8.4%	8.5%
Sharpe Ratio	0.77	0.90	1.02	1.12
Change in Annualized Return	--	**1.0%**	**2.1%**	**3.1%**
Change in Annualized Risk	--	**-0.1%**	**0.0%**	**0.1%**
Ratio Improvement	--	**17%**	**33%**	**47%**

FIGURE 9: **HYPOTHETICAL SIMULATED PORTFOLIO PERFORMANCE**[14]
Cumulative (ln)



14. Performance is shown from June 30, 2013 through June 30, 2016. Global 60/40 consists of a 60% allocation to the iShares MSCI ACWI and a 40% allocation to the Vanguard Total International Bond ETF. Performance of bitcoin is based on the daily values of the Bloomberg Bitcoin Price Index (USD). 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.

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 risk.

- Allocating 1% bitcoin to the Global 60/40 increased annual returns by 103 bps, reduced volatility by 7 bps, and improved the return-to-risk ratio by 17%.
- Allocating 2% bitcoin to the Global 60/40 increased annual returns by 207 bps, reduced volatility by 4 bps, and improved the return-to-risk ratio by 33%.
- Allocating 3% bitcoin to the Global 60/40 increased annual returns by 312 bps, without materially increasing volatility, to improve the return-to-risk ratio by 47%.

Because bitcoin offers return-enhancing, risk-reducing potential to both safe haven allocations and traditional investment portfolios, we believe it could soon become an important part of the strategic asset allocations of institutional and individual investors. We are excited to deliver more insights on the evolution of these dynamics over time, as investors appreciate the benefits that bitcoin and digital currency can offer to their portfolio construction process.

Conclusion

Despite numerous claims that “bitcoin is dead” the network continues to grow and thrive. Increased investment in bitcoin and blockchain startups, formation of digital currency sub-industries, and meaningful activity on the bitcoin network all suggest that adoption has reached the point of critical mass and that bitcoin is here to stay. In this rapidly evolving landscape, our entire financial system is poised to evolve from one that relies on a handful of large centralized institutions, to one that instead relies on billions of peers within a globally distributed network. We’ve witnessed this evolution before – when entire industries such as media, software and communications were transformed and invigorated by the proliferation of the internet. We are experiencing a similar revolution in financial services, where digital currency could replace our antiquated, costly, and time-consuming systems and gives rise to an entirely new structure that facilitates payments, streamlines accounting processes, and enforces contracts with ease and scalability. For these fundamental reasons, we believe bitcoin can gain widespread adoption and solidify its role as a new and improved digital gold.

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.

Grayscale is headquartered in New York City. For more information on Grayscale, please visit, please visit www.grayscale.co or follow us on Twitter @GrayscaleInvest.

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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 VEHICLE 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 VEHICLE WILL PERFORM, WHICH COULD CAUSE THE ACTUAL RETURN OF SUCH VEHICLE 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 VEHICLE 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 Vehicle were it in existence during the historical period selected. The hypothetical simulated performance results do not reflect any fees incurred by a Vehicle. 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 VEHICLE 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.

Certain Risk Factors

Each Vehicle 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 Vehicle, including but not limited to:

- **PRICE VOLATILITY**
  Digital assets have historically experienced significant intraday and long-term price swings. In addition, none of the Vehicles currently operates a redemption program and may halt creations from time to time. There can be no assurance that the value of the common units of fractional undivided beneficial interest ("Shares") of any Vehicle will approximate the value of the digital assets held by such Vehicle and such Shares may trade at a substantial premium over or discount to the value of the digital assets held by such Vehicle. At this time, none of the Vehicles is operating a redemption program and therefore Shares are not redeemable by any Vehicle. Subject to receipt of regulatory approval from the SEC and approval by the Sponsor or Manager, as applicable, in its sole discretion, any Vehicle may in the future operate a redemption program. Because none of the Vehicles 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 Vehicles 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 Vehicle 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 Vehicles intends to take the position that it is a grantor trust for U.S. federal income tax purposes. Assuming that a Vehicle is properly treated as a grantor trust, Shareholders of that Vehicle generally will be treated as if they directly owned their respective pro rata shares of the underlying assets held in the Vehicle, directly received their respective pro rata shares of the Vehicle's income and directly incurred their respec-tive pro rata shares of the Vehicle'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 Vehicle 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 Vehicle will be illiquid and there will be significant restrictions on transferring interests in such Vehicle. The Vehicles 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 Vehicle 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 Vehicle 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 Vehicles 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 Vehicle, 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 Vehicles 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 Vehicles and their sponsors or managers and advisors and agents may be subject to various conflicts of interest.

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

Additional General Disclosures

Investors must have the financial ability, sophistication/experience and willingness to bear the risks of an investment. Any offering or solicitation will be made only to qualified accredited investors as defined under Rule 501(a) of Regulation D pursuant to a formal offering with additional documentation, all of which should be read in their entirety and contain material information not contained herein. Any offer or solicitation of an investment in a Vehicle may be made only by delivery of its confidential offering documents to qualified accredited investors. You should rely solely on such offering documents in making any investment decision. An investment in Grayscale's Vehicles are not suitable for all investors.

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 Vehicles and Grayscale Investments, LLC ("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. This document shall not constitute an offer to sell or the solicitation of an offer to buy these securities, nor shall there be any sale of these securities in any state or other jurisdiction in which such offer, solicitation or sale would be unlawful, and there is not enough information contained in this message on which to make an investment decision and any information contained herein should not be used as a basis for this purpose.

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

GRAYSCALE

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