Bitcoin Fixes Payments for a U.S. Firm in El Salvador

In recent years, we have seen significant improvements in e-money systems such as Paypal, Zelle, and CashApp. Fintech companies have optimized payment methods providing consumers the ability to move funds quickly, easily, and safely with trusted non-bank third parties – including internationally. This improves the user experience for payments despite aging settlement methods among central banks. Although these fintech options are well-suited for US-based consumers, additional obstacles present hurdles such as currency conversions, higher cost of transfer, and slow settlement times for cross-border payments.

Digital currencies such as Bitcoin offer payment options designed to provide fast and convenient services to users around the world. While there are rewards associated with the use of cryptocurrencies as a payment method, there are also associated risks. Despite this, many organizations are incorporating cryptocurrencies as payment methods. For instance, Tesla announced that it would begin accepting Bitcoin, but gave up due to “environmental concerns.” In another example, it is reported that over 85,000 merchants in Switzerland are now accepting Bitcoin at point of sale (POS). El Salvador’s government made Bitcoin a legal tender in 2021, thus becoming the first country to do so. Additionally, it has also announced the creation of an economic zone in which an entire city will be based on and funded by Bitcoin. This includes residential and commercial areas as well as entertainment, restaurants, and an airport near the Conchagua Volcano[1].

Cryptocurrencies are gaining in the market share for money, although many vendors may hesitate to accept them as payment for goods and services. We have identified a company (referred to as **The Firm**) that exports used cars to developing markets such as Nigeria, El Salvador, Ukraine, Cambodia, etc. In El Salvador, The Firm sees Bitcoin’s legal tender status as

[1] BBC News

a possible tool to address payment issues like the speed and settlement of transactions, which The Firm sees as beneficial to shipping its inventory. Bitcoin transactions have the added benefit of being inexpensive. The Firm's costs for cross-border payments often approach or exceed 5% of the value for a given car, acting as a tax on end users. While Bitcoin could solve these payment challenges, The Firm must assess if the benefits outweigh the risks. We recommend The Firm adopt Bitcoin as a payment method.

El Salvador's Monetary Context

> *"In El Salvador, we are trying to… start the design of a country for the future. Using the best ingredients that makes us who we are while using sensibility to find the best examples of ideas from history and around the world, I believe Bitcoin could be one of these ideas. That is why next week, I will send to Congress a bill that will make Bitcoin a legal tender in El Salvador." (President Nayib Bukele[2])*

As a dollarized country, El Salvador enjoys the relative stability and liquidity of the US dollar (USD) along with access to remittance flows from its diaspora. However, since it lacks the powers of currency issuance and seigniorage, El Salvador must bear the dilutive costs of expansionary US monetary policy with none of the fiscal benefits from debt monetization. Indeed, as Strike CEO Jack Mallers said while introducing President Bukele's announcement, "[USD] inflation is not distributed equally" to the detriment of emerging markets[3]. Personal remittances to El Salvador in 2020 were equivalent to 24% of the country's GDP[4] - racking up over $200M in annual fees to heavily US-based intermediaries[5]. Downstream of those fees, remittance recipients are also mostly unbanked and bear many resultant risks. Salvadoran adoption of Bitcoin is a fascinating test of this technology against significant challenges related to storing and transmitting value.

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[2] Bitcoin Magazine
[3] Bitcoin Magazine
[4] World Bank
[5] Flood

Why Accept Bitcoin?

“Writing a description for this thing for general audiences is bloody hard. There's nothing to relate it to.” (Nakamoto)

Bitcoin offers The Firm both transactional and non-transactional benefits. For transactions, users control their private keys and settle through nodes, thus Bitcoin’s native token operates as a bearer asset like cash. The cost of operating a performative Bitcoin node is negligible, so integrating these payments is easily done with hardware available in El Salvador or the US. Benefits to The Firm of running a node include reduced transaction costs by validating payments, eliminating counterparty risk in settlement, and managing custody of holdings. The Bitcoin network’s open design, global accessibility, and inclusivity (Exhibit 1) offer The Firm an opportunity to transact outside the US at lower cost than with fiat currencies. For POS terminals, The Firm may also consider service providers like Strike - where merchants can accept Bitcoin and USD payments that settle instantly with near-zero fees, including international and cross-currency transactions[6].

The Firm’s benefit will extend beyond a transactional use. Holding Bitcoin on its balance sheet as part of a long-term treasury reserve strategy will counteract USD inflation with an uncorrelated scarce asset, hedge Bitcoin’s upside risk, and accumulate a new form of collateral. There is a chance of US sovereign deleveraging in the next 10 years through inflationary means such as continued financial repression and/or yield curve control[7] - a Bitcoin position might mitigate the effects of these when valued like a credit default swap on sovereign debt[8]. The switching costs for a global monetary order are extremely high and if a deleveraging event does not occur or if foreign USD reserves strengthen, Bitcoin’s growth may ebb. This currency stability would benefit The Firm, however, we see that as unlikely given these observations:

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[6] Strike
[7] Dalio, p. 42 to 54
[8] Foss

- The US endured deleveraging through two major currency devaluations in the last century with lower debt-to-GDP than today[9, 10]
- The global market for USD liquidity may signal a new Triffin Dilemma[11]
    - In which a country whose money is the global reserve currency must be willing to supply the world with an extra supply of currency to fulfill world demand for foreign exchange reserves, leading to persistently high trade deficits and resultant domestic challenges[12]
- The Federal Reserve's chronic use of quantitative easing precludes market feedback from "bond vigilantes," allowing negative real yields to persist longer than prior inflationary periods[13]
- Fed Chair Powell's recent statement before Congress that there could be multiple reserve currencies in the future[14]
- Since 2014, foreign USD holders have reduced their exposure on a percentage basis of the overall Treasury market (Exhibit 2)

Bitcoin's pattern of price appreciation is an additional non-transactional benefit. Holding a capitalized position for durations longer than four years would expose The Firm to potential upward price movements after halving events (Exhibit 4). These roughly quadrennial programmatic supply shocks cut the issuance rate of new Bitcoins in half, change the economic incentives for network actors, and contribute to price discovery[15]. A long position of this type

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[9] These reference President Roosevelt's Executive Order 6102 (1933) where the US government devalued the USD to gold peg, and President Nixon's closure of the gold window in 1971 - ending the Bretton Woods regime of fixed exchange rates.
[10] Longtermtrends
[11] Alden
[12]https://en.wikipedia.org/wiki/Triffin_dilemma#:~:text=The%20Triffin%20dilemma%20or%20Triffin,serve%20as%20global%20reserve%20currencies, accessed 21 Apr. 2022
[13] Ortlieb
[14] U.S. House Committee on Financial Services
[15] This phenomenon is best viewed with the BTC/USD price chart on a logarithmic scale rather than linear, overlaid with prior halving events (Exhibit 4). While statistically invalid, the Stock-to-Flow Model is a

produces a hedging effect against the tail risk of Bitcoin rising in price, which would accrue shareholder value if it appreciates relative to The Firm's other assets. If Bitcoin's upside risk is realized, a long position may also grant The Firm a new type of collateral to borrow against as well as a new medium through which to reinvest or return capital to shareholders.

Given these transactional and non-transactional benefits, we recommend accepting Bitcoin for vehicle sales in El Salvador, capitalizing a portion received as de facto retained earnings on the balance sheet, maintaining US-based custody of the underlying, and converting the rest to USD at point of sale. Regardless of the relative volume of currencies used in Salvadoran sales, setting aside and retaining 1% of Bitcoin revenue is a conservative yet effective start to gain exposure and experience. By meeting USD-denominated expenses using the 99% of transaction value settled in USD, The Firm ends up with an allocation to Bitcoin larger than 1% of free cash flow from El Salvador operations in a given accounting period. Within GAAP, Bitcoin received can be added to the balance sheet as an "indefinite-lived intangible asset" at book value[16], which is easily denominated in dollars at the sale price. Retained Bitcoin earnings on the liability side are then also marked at book value in USD.

Risk Analysis and Mitigation

The Firm should not implement Bitcoin as a payment option without looking at risks involved. Here we will examine four leading risks for Bitcoin: user education, price volatility, market regulation (or lack of), as well as risks specific to The Firm's El Salvador market.

Risk 1. The leading risk for Bitcoin is consumer education and acceptance. How does Bitcoin work? What backs up your Bitcoin investment? If Bitcoin will be a viable legal tender, people must be comfortable using it as such. Many Bitcoin investors are buying it merely on speculation that it will continue to monetize. Investors hope it remains stable as a currency but

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prominent example of the various ways that analysts and investors have tried to grasp and value the relationship between Bitcoin's scarcity and price (PlanB).

[16] Wilson

may lose purchasing power if they're wrong or make technical mistakes. For the average citizen, Bitcoin is a strange and foreign concept, a monetary value you can't easily walk into local stores and exchange for goods and services. This is a significant and unique risk, it's a new currency that is not widely understood or trusted.

Proposed methods to educate The Firm's stakeholders:

1. Study and adapt the abundant free educational resources from companies that have adopted Bitcoin. Consult with a corporate tax attorney to address tax implications ex-ante and ex-post.
2. Consider ways that Bitcoin may rate favorably among Environmental, Social, and Governance (ESG) frameworks (Exhibit 3). Educate The Firm's stakeholders on the auditability and economic data native to Bitcoin. Many of these may dispel perceived reputational risks, reveal new addressable markets, and build a position of competitive advantage.
3. Consult with experienced Bitcoin users and businesses on technical aspects. Exploring general concepts will lead to best practices around managing cryptographic keys, node operation, hardware and software supply chain risk management, custody models, transactional privacy, and much more.

Risk 2. Directly related to its novelty and intangibility, is Bitcoin's price volatility (exchange rate risk). Bitcoin has seen intense swings in trading price, dropping by 50% as recently as the summer of 2021[17]. Suffering several more ups and downs in the next four months, Bitcoin found itself trading at an all-time high against the USD in November of 2021[18]. This kind of volatility reflects the fickle and sensitive nature of Bitcoin as an investment.

[17] Edwards
[18] Ibid.

<u>Proposed methods to mitigate volatility (BTC/USD exchange rate) risk</u>:

1. Hold a conservative position size – only retaining in Bitcoin an amount The Firm can save for the next 4 to 10 years and which can be exited even during periods of constrained liquidity.
2. Actively hedge the long Bitcoin position with derivatives by purchasing long put options against Bitcoin on a recurring basis, with contract positions sized to match the capitalized holdings. Downside risk of this derivative strategy is limited to the premium paid. The upside of this trade is covering losses should Bitcoin crash against USD or go to zero.

Risk 3. Bitcoin lacks regulatory clarity, and without regulation Bitcoin will struggle to gain mainstream trust as a monetary asset or currency. U.S. Securities and Exchange Commissioner Hester Peirce stated in February of 2022, “We don't have a rulebook in place that works for crypto exchanges as they currently operate” and she doesn’t expect there to be one put in place this year. U.S. Securities and Exchange Commission Chair Gary Gensler stated, “Frankly, as I’ve said before, I think it’s more like the Wild West,” and on another occasion Gensler stated the market was “rife with fraud, scams and abuse.”[19]

Successful currencies are trusted by their users, with trust in fiat currencies mandated by law. As an example, Russia may default on foreign-denominated loans because of creditors losing trust in and access to Ruble payment rails. Falling international trust in the Ruble may serve as a warning to Bitcoin. The USD continues to serve as global reserve currency because, through U.S. rule of law and inertia, it is a trusted means of payment. Much of the population will struggle with Bitcoin until some form of regulation allows companies, investors, and individuals to use it with greater trust and legal protections.

[19] Kolhatkar

Proposed mitigations for domestic regulatory risk:

1. The Firm should lobby policymakers as a proactive measure - including through auto industry interest groups. Opportunities for public dialogue abound between the Senate Financial Innovation Caucus and executive agencies currently holding public comment periods related to the March 2022 Executive Order on digital assets[20].
2. Hold Bitcoin for a long duration to outlast today's regulatory uncertainty. Over the long term, the emergence of new policy regimes may grant favorable treatment due to growing adoption, jurisdictional competition, and the Lindy effect[21].

Risk 4. El Salvador's reputational risk as a country is very high. The president of El Salvador has mandated businesses accept Bitcoin as a monetary measure (the measure's path to codification is itself widely questioned abroad). While he has also promised to maintain domestic liquidity sufficient for a healthy foreign exchange market, it is unclear how the country will accomplish this.

Proposed mitigations for El Salvador's political risk:

1. Adopt Bitcoin payments to allow instant cross-border settlement to the US and escape any surprise or rapid capital controls in El Salvador, using a dual Lightning- and onchain-compatible wallet for a POS terminal (like BTCPay Server). Consider additional options built to operate without internet connectivity, which is a common situation in the country. Third-party service providers like Strike can mitigate constrained USD liquidity in local and cross-border settlement at The Firm's modest scale, possibly with a long-term macroeconomic backstop from El Salvador's National Treasury Bitcoin holdings.

[20] The White House
[21] Taleb

   a. For onchain Bitcoin receipts, wait for 3 transaction confirmations (average of 30 minutes) before releasing vehicles or moving funds to ensure synchronization with the consensus blockchain.

2. Gain access to additional BTC/USD liquidity by creating one or more accounts on ex-El Salvador exchanges to exit the spot position if needed. Corporate accounts and support features are available on most US-based exchanges at no or low cost.

Conclusion

Our research indicates The Firm would benefit from accepting Bitcoin as a payment option for cars sold in El Salvador. Bitcoin is a secure, highly liquid, low fee, and fast way to move money. There are associated risks, but the risks can be managed with sound approaches providing The Firm with strategic benefits that clearly outweigh the associated risks. As the global financial system evolves, companies must adapt new strategies and technology to retain competitive advantage, and Bitcoin fixes this.

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Exhibit 1: Global Cryptocurrency Adoption and Inclusivity

In this exhibit, we take BIS membership as a proxy of inclusivity in the post-Bretton Woods US-led global monetary order, with GDP as a sign of overall economic influence. We then compare per capita cryptocurrency adoption as an indicator for grassroots trust and inclusivity in a novel, emerging monetary asset class. Layering in The World Bank's categorization of national income levels shows a sharp contrast between usage of permissioned and permissionless monetary systems ("haves and have-nots"). Weaponization of the USD in recent years may also foster resistance to and usurpation of its primacy as alternatives emerge.

Rank	**10 Largest BIS Member Banks (by 2020 Real National GDP [PPP])**	**10 Largest Cryptocurrency Adopters, 2021 (Per Capita)**
1	China	Vietnam
2	United States	India
3	India	*Pakistan*
4	Japan	*Ukraine*
5	Germany	*Kenya*
6	Russia	*Nigeria*
7	Indonesia	Venezuela*
8	Brazil	United States
9	France	*Togo*
10	United Kingdom	Argentina

Legend

BIS member *Non-BIS member*

High and higher middle income	Low and lower middle income

*The World Bank does not provide a 2020 income categorization of Venezuela, and we estimate it to be low or lower middle income based on recent economic turbulence and falling GDP per capita.

Exhibit Sources

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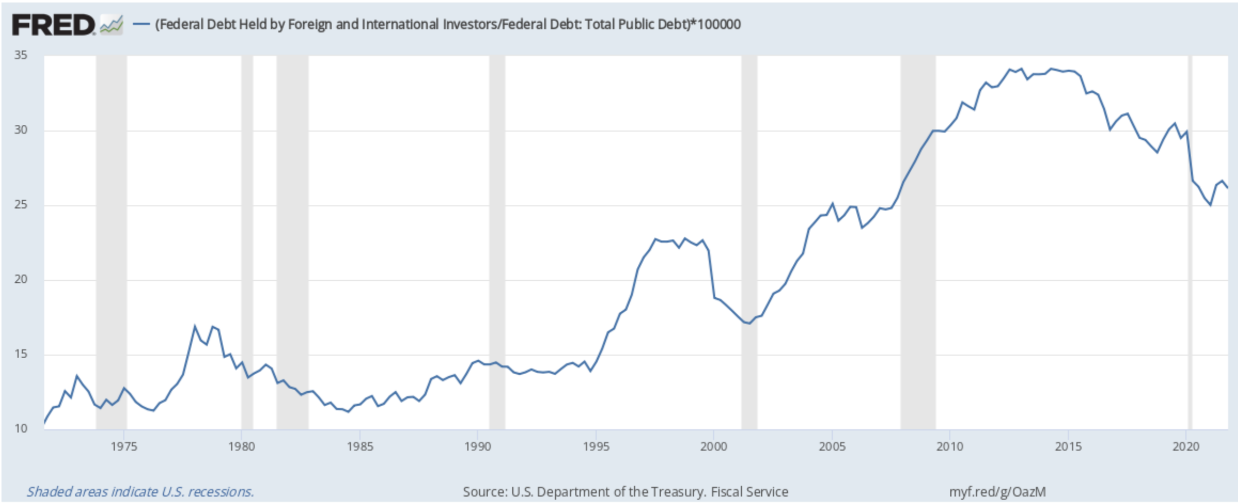
Exhibit 2: Percent of U.S. Treasuries Held by Foreign Investors (1971 to Present)



This graph depicts the percentage of total US sovereign debt held by foreign and international investors since the “Nixon shock” of 15 Aug. 1971 - with Treasury holdings as the leading manifestation of the USD’s reserve currency function. Increases of this percentage imply rising utility of the USD in settling global trade and as a store of value relative to domestic use.

This percentage peaked above 34% in Q2 2014, falling to 26% by Q4 2021. We assess that this decline is driven by a combination of rising US energy exports, Federal Reserve bond buying, and declining confidence in the USD - whether by interest rate and policy expectations or rising confidence in alternative stores of value. If this 8-year trend continues, we would expect foreign creditors and central banks to allow Treasury bonds to roll off their balance sheets at maturity and rotate dollar holdings into other assets rather than selling into illiquidity with slippage risks. Such an occurrence would signal the USD losing relative dominance as the leading global reserve currency.

The figures depicted are the sum of foreign holdings of US debt in billions of dollars, divided by the total US sovereign debt in millions of dollars, and multiplied by 100,000 to achieve both unit commonality and illustrate as a percentage.

Exhibit Source: https://fred.stlouisfed.org/graph/?g=OazM

Exhibit 3: Bitcoin ESG Talking Points

Investors with ESG mandates may influence firms and governments to work against Bitcoin, mostly due to purported environmental harm from its proof of work consensus mechanism. Many such public arguments miss salient details about the physical, economic, and social realities of Bitcoin's usage. Educating The Firm's shareholders, industry interest groups, and elected officials may be the most direct mitigation for US regulatory risk. Along with educational elements, consider potential talking points for these efforts to include:

Environmental: As the energy "buyer of last resort," Bitcoin mining incentivizes the use of stranded and curtailed renewables, mitigates methane emissions from petroleum drilling and other sources (landfills, animal husbandry, etc.), offers rapidly scalable load balancing, and creates location- and time-agnostic energy demand to incentivize innovation - stabilizing grids and driving down energy costs over time. Bitcoin uses far less energy annually than gold mining and with less direct environmental impacts, which central banks contribute to by their gold purchasing and hoarding. Most arguments against proof of work mining also rest on a moral equivalence around energy usage, which is logically fallacious at best, disingenuous at worst, and ignores the social and governance benefits.

Social: While it may be hard for those living in financially privileged countries to appreciate, Bitcoin offers a seizure- and censorship-resistant money to people living under authoritarian regimes, dissidents, refugees, and without access to banks. Bitcoin companies are creating jobs in places with abundant energy, regulatory advantages, and software talent. As a medium for capital mobility, Bitcoin also counteracts governments' ability to devalue currencies and unilaterally seize purchasing power through the hidden tax of inflation - typically implemented without representation. By adding immutability and marginal costs to money creation, Bitcoin's financial system reduces the Cantillon Effect that drives wealth inequality. Indeed, these benefits to society create value far beyond any of the most common environmental concerns.

Governance: Bitcoin is a voluntary system with no insiders or features to exclude new entrants. As open-source software, anyone in the world can anonymously offer ideas for improvement and no programmer or institution can hijack the rules. By offering a tool to dissidents and marginalized groups (Nigerian End SARS movement, Afghan refugees, Russian opposition figures, the Ukrainian government, Canadian "Freedom Convoy" protestors, etc.), Bitcoin has funded movements facing financial censorship. In the long run, similar instances may reduce the reach and impact of authoritarian regimes or policies.

Exhibit Sources

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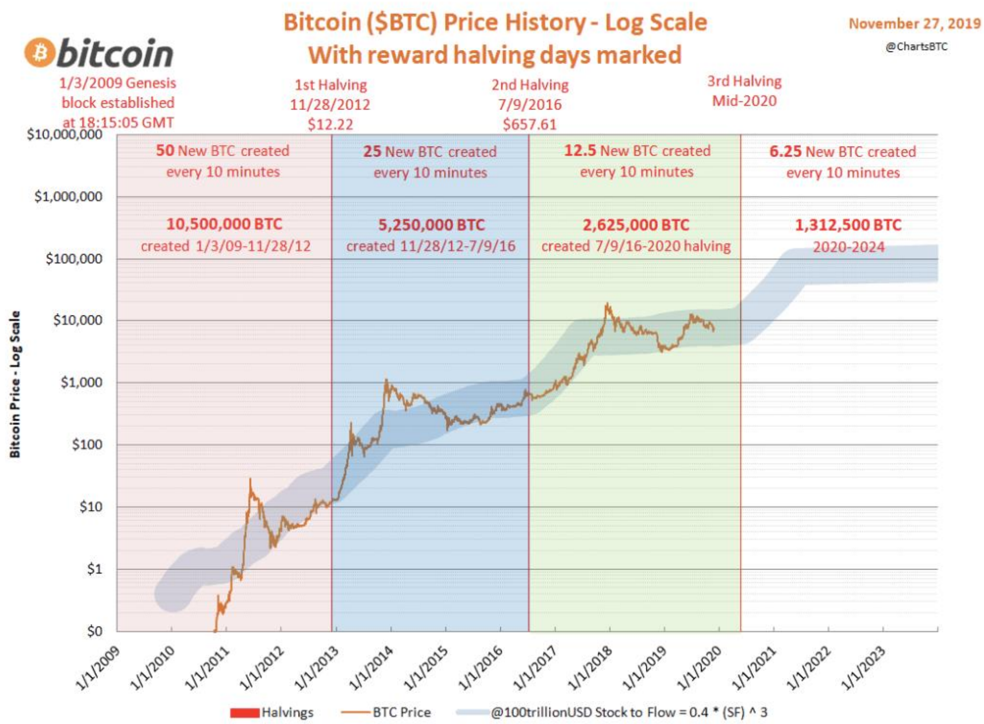
Exhibit 4: Bitcoin Halving Trends

While the underlying premise for this chart rests on flawed and invalidated univariate analysis, the historic observed relationship between halving events and USD exchange rate is most often overlooked in mainstream concerns about “price volatility.” Viewed logarithmically, charts like this can be overlaid with “obituaries” from numerous economists and commentators to show its antifragile properties. Bitcoin’s continued growth demonstrates the protocol and native token possess unique properties worth considering. Indeed, The Firm may be well-positioned to meet its fiduciary duties by gaining long exposure to Bitcoin’s upside risk.



Courtesy of @ChartsBTC on Twitter, this logarithmic chart shows Bitcoin’s price against halvings.