The State of Stablecoins

Why They Matter and Five Use Cases

Acknowledgements

Stably

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Abstract

Price-stable cryptocurrencies, commonly referred as stablecoins, have received a significant amount of attention recently. Much of this has been is in hopes that they can fix some of the issues with cryptocurrency—most notably price instability. However, little analysis has been done with respect to the drivers and investment potential of stablecoins. Stablecoins fulfill different functions of money based on their implementation. As a result, they have unique trade-offs from one another and from physical currency (fiat) itself. Stablecoins offer a similar value proposition to fiat, but the two should not be compared on a one-to-one basis as stablecoins contain unique trade-offs and benefits. These differences will drive the demand for these tokens while enabling specific use cases.

The purpose of this paper is to shed light on the adoption and the potential of market share growth for stablecoins given five selected use cases: dollarization, smart contracts, peer to peer (P2P) and peer to business (P2B payments), safe haven for exchanges, and as a reserve currency. We will discuss the opportunities within each of these use cases and assess the factors which will determine the success of stablecoins. Using insights contained in this paper, technologists can think about how best to position themselves in the short, medium, and long term.

Introduction

A stable digital currency has the largest total address market (TAM) of any cryptocurrency—$90 trillion—according to Myles Snider, an advisor to the cryptocurrency venture capital firm Multicoin Capital. This estimate assumes global adoption of stablecoins as an alternative currency replacing fiat altogether. This is certainly a far-fetched possibility. However, it does convey the opportunity for stablecoins to impact billions of people in the way they transact.

Potential opportunities to leverage this technology include the use of stablecoins as safe-haven assets on cryptocurrency exchanges, the expansion of dollarization in emerging economies, P2P and P2B payments, integration with smart contracts, and the use of stablecoins as a central bank reserve currency. These opportunities vary in the time frame of addressability and factors leading to success.

This paper is divided into two sections. The first section consists of an overview of key concepts about the roles of money, the different types of stablecoins, and the historical circumstances surrounding stablecoins. The second section of the paper consists of use cases of each opportunity.

1. History and Context for Stablecoins

1.1 History of Currencies

Long ago, trade was done by barter and, as a result, exchange rates were uncertain and dependent on the goods being traded. Over time, people found it easier to use specific forms of value to simplify trade (i.e. currencies). Goods were denominated in shells, stones, and eventually metal coins. Banks came into existence out of the need for a secure housing of currencies. Eventually, in order to make transactions easier and after significant trust (a recurring topic of importance in this paper) had been developed in banks, people began trading orders to transfer currency between accounts (banknotes). These banknotes established evidence for the negotiable settlement of debt—meaning verifiable documents which told the banks to transfer currency from one person to another. This is how much of the developed world operated until the Bretton Woods system —the beginning of global dominance for the US dollar (USD).

Under the Bretton Woods system established in 1944, all currencies were indirectly backed by gold because they were convertible to USD (likewise, banknotes were convertible to gold). In 1971, however, US President Richard Nixon suspended the ability to convert USD to gold, thus decoupling much of the global system from gold and making the US dollar an unbacked, free floating, fiat currency. Relative stability remained despite no concrete peg or exchange rate for USD. After the end of the Bretton Woods system, global currencies have been mostly fiat (unbacked by anything other than a government's agreement to recognize the value of a specific currency).

1.2. What is the Key Opportunity for Stablecoins?

Although not broken, the global currency market has room for improvement. Many regions in the world are experiencing hyperinflation, often resulting in the disappearance of wealth virtually overnight. Monetary policy tools are mostly indirect and their effects on the future are often debated. Cash transactions often come at a high cost.

In short, technologists have created stable, digitally-native currencies which are built on top of the underpinnings of existing blockchain technology. Stablecoins help avoid the volatility associated with cryptocurrencies while retaining the benefits of full provenance (auditability) of transactions, programmability, and the capability to efficiently transact across borders. Hundreds of bright minds and vast amounts of capital are pushing for stablecoin adoption—both as a fiat currency alternative and as a new payment system. For example, top financial institutions and investors such as Goldman Sachs, Peter Thiel, Andreessen Horowitz, Bain Capital Ventures, Y Combinator, Facebook (specifically developing a stablecoin for remittances in India), and countless others have invested millions into projects in this space. For the first time in history, we could see the adoption of disintermediated value transfer systems; these systems are uncensorable, not dependent on any sovereign system, and act as a non-volatile store of value.

Even governments are looking into ways they can improve their currencies. For example, the Russian Association of Cryptocurrency and Blockchain plans to release a "crypto-ruble" in 2019, and a fund backed by the government of the Chinese city Hangzhou is working with a Japanese bank to create a Yen-pegged stablecoin. The use cases for a government stablecoin include seeking means to track transactions, maintaining capital controls, implementing effective monetary policy, and avoiding sanctions. Many governments are also wary of the risks that decentralized stablecoins pose. These risks include undermining the effectiveness of monetary policy (depending on implementation), loss of seigniorage profits, money laundering, loss of government autonomy, and other threats.

1.3. The Meaning of Money

The qualities that make money usable are often taken for granted. According to the International Monetary Fund (IMF), in order for money to be successful, it must have these three functions:

- **Store of value:** Its value does not depreciate (quickly). For example, vegetables are a poor store of value in that they rot and become worthless within only a few weeks. As a result, they

are not a good asset for storing wealth. Compare this to USD, which hovers at ~1.5% depreciation per year.

- **Medium of exchange**: People must use it in transactions. For example, real estate stores value very well, but no one buys goods or services using their home as means of exchange due to the high costs associated with transferring ownership. Thus, these assets are not well-suited as a medium of exchange. Similarly, payment platforms, such as Stripe, have stopped accepting Bitcoin due to its transaction costs and high volatility, resulting in reduced value as a medium of exchange.

- **Unit of account:** The currency should exhibit the ability to be denominated in a useful manner. For example, gold may hold its value well and could be carried in a transportable manner (e.g. gold coins), but it would still be difficult to pay for goods and services using gold because most products and services are not denominated in it.

(Economists differentiate between currency and money—for the purposes of this paper, we will use the two terms interchangeably.)

All of the functions above are necessary for a currency to reach widespread adoption over time. So the question remains:

Why should anyone use stablecoins instead of fiat, such as USD? The answer is not so simple.

As a medium of exchange, fiat has the clear advantage of mainstream adoption. Cryptocurrencies, on the other hand, are generally not used in transactions, thus limiting their use as a medium of exchange. However, fiat can be slow and relies on antiquated technology and regulatory restrictions. On the other hand, cryptocurrencies offer instant settlement (barring current network limitations) and the potential for anonymity/pseudo-anonymity. Therefore, stablecoins hope to benefit from the foundations of cryptocurrency and act as a medium of exchange similar to traditional fiat.

As a store of value, fiat is at risk of centralized default. This means that one's money is only as safe as the depositors' confidence in the centralized system and only up to the government's insured amount. Most stablecoins in the market today, on the other hand, are built on a publicly distributed ledger that ensures trustless immutability and removes the need for a central party to "police" the ledger. In more complicated purchases (prone to error or arbitration), the immutability of cryptosystem logs actually becomes a shortcoming. Moreover, traditional cryptocurrencies suffer from extreme volatility, making them an unreliable store of value. Stablecoins carry the benefit of cryptosystems and solve the problem of volatility.

As a unit of account, fiat has the advantage of being the default unit of account for purchasing goods and services. In the majority of stores, goods are priced in government fiat currencies. This is why the vast majority of current stablecoins are pegged to the value of a fiat currency. Some stablecoin projects, such as Reserve, seek to someday move away from this peg and become an independent unit of account.

In becoming a useful medium of exchange, store of value, and unit of account, currencies have changed much throughout history. One of the most critical factors developed over time is trust.

Before societies could make use of currencies like metal coins, people needed to trust that other people would find value in these coins. Before societies transitioned from precious metals to banknotes as currencies, people needed to trust that banks would be faithful in their promise to redeem the notes for precious metals. Otherwise, banknotes and metal coins would be a poor store of value.

Similar to how trust in the value of a coin or in the faithfulness of a bank was built up over many years, we can expect that trust in stablecoins as a unit of account, medium of exchange, and store of value will take time to develop. These qualities, however, will develop as iterations upon existing projects take stablecoins further in terms of technical functionality and public trust.

Currently, the combined market cap of the top stablecoins is almost $2.5 billion USD (about 2% of the market cap of all crypto projects combined). The majority of the stablecoin market cap is held by one project—Tether. Although Tether currently enjoys market dominance, there is an opportunity for second-movers to excel in specific use cases by employing new technology and business models. In Section 2 we will explore the history of Tether and outline the three main types of stablecoins.

2. The State of Stablecoins

2.1. The Tether Project

The current stablecoin ecosystem is mostly dominated by one player—Tether. Tether is a crypto asset built on top of both the Omnichain and Ethereum networks. At the time of writing, the project enjoys a $1.877 billion market capitalization which represents 75% of the whole stablecoin market. Tether claims to be collateralized by USD at a 1:1 ratio. In theory, this means each token is a promise to redeem one USD from a reserve, although in practice this has been difficult due to opaque agreements.

Starting in August, Tether has fallen under scrutiny because of its relationship with the Hong Kong-based exchange, BitFinex. Journalists and researchers have alleged Bitcoin price-fixing schemes enacted on the Bitfinex exchange (the entry point for most Tether coins) by publishing critical articles such as “Is BitCoin Really Un-Tethered?”. Furthermore, both BitFinex and Tether share the same management team (CEO, Jan van der Velde, and Director/Chief Strategy Officer, Phil Potter), adding additional weight to the research-based indictments.

These allegations have significantly undermined the public's trust in Tether. As a result, the allegations of Tether fixing Bitcoin's price has prompted the US Justice Department to open a probe. This has caused Tether's price volatility (see chart below).

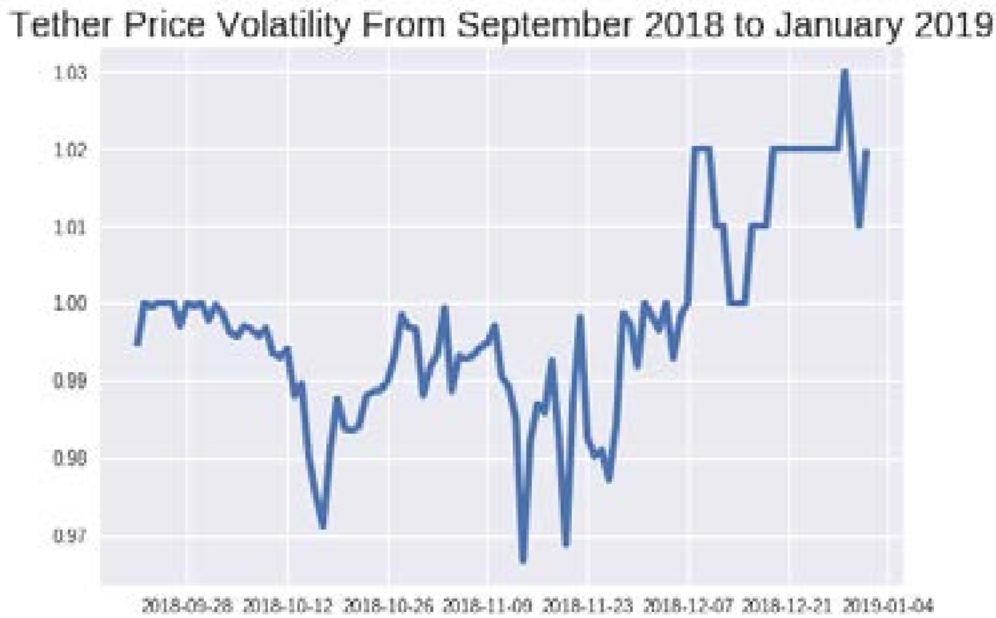

Figure 1: Tether Price Instability from September 2018 to January 1st 2019 (data from Coinmarketcap.com)

In spite of this recent negative publicity, as a proof-of-concept (POC), Tether has demonstrated an immense upside for a stable digital currency. Tether's market cap increased almost 90% (Figure 2) while the top 15 cryptocurrencies (excluding stablecoins) decreased by almost the same amount. With the project's regulatory issues and public distrust, there is an opportunity for second-movers in the stablecoin space to leverage new business models, technologies, and practices in order to leapfrog Tether and take away its market share.

Figure 2: Tether Market Cap increase from January 2018 to October 2018 (data from Coinmarketcap.com)

To demonstrate the investability of these new asset classes we need to classify stablecoin projects by common traits. Then we will describe the upside and downside of each of these variations

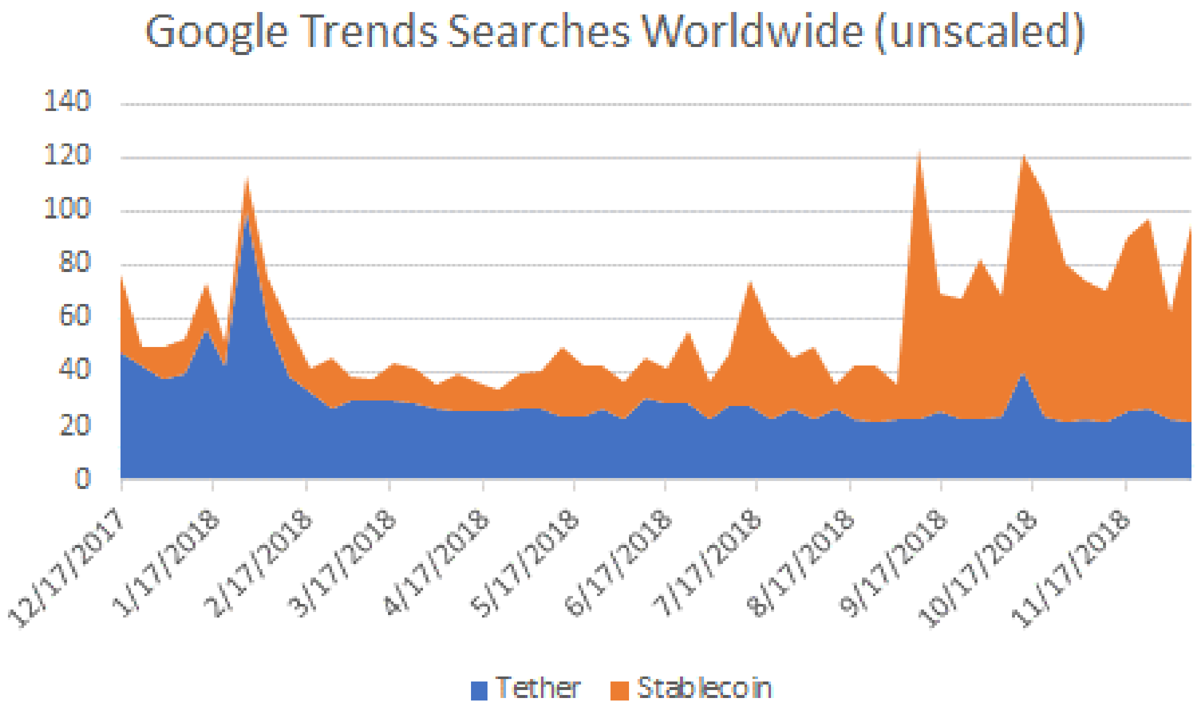

Figure 3: Google Trends analyzing the increasing interest in stablecoins relative to Tether (not to scale).

2.2. Three Types of Stablecoins

2.2.1. Type 1: Fiat-Collateralized Stablecoins

The first classification of stablecoins is fiat-collateralized stablecoins. Collateralization refers to a pledge to a specific asset by a lender. By this, a collateralized stablecoin is sold to an individual for one USD with the promise of a reserve backing of each token. This category includes Tether as well as second-movers, such as TrueUSD, Paxos, Stably, and Circle. These projects derive their stability from the promise that each token is issued on a 1:1 basis with a corresponding fiat currency held in reserve.

The second-movers differentiate themselves from Tether with a more thorough regulatory compliance (including Know Your Customer and Anti Money Laundering compliance) and increased transparency for consumers at the onset. However, this requires these currencies to have 100% reserve of fiat (as a reference, banks exceeding $122.3 million in net transaction accounts are required to have a reserve ratio of 10%). Furthermore, despite the fact that this model is simple and proven, there are risks associated with its centralized nature. This can include default risk (also known as counterparty risk), which means a stablecoin company can make claims of redemption that it does not have the reserves to satisfy the requirements. This is a trust-reliant model; if consumers don't trust the integrity of the bonds, their value will not hold. For example, many countries trust the value of U.S. bonds because they believe that the U.S. government is unlikely to default on its loans.

These stablecoin companies issue tokens on a 1 to 1 basis with fiat reserves that they hold. For example, if we were to purchase $5 worth of Tether, the company will issue 5 USDT tokens. Fiat-collateralized stablecoin companies earn interest on the reserves that they hold. Therefore, a larger market cap means more revenue. As a result, the fiat backed stablecoin companies that are valued higher are those which have the potential for more adoption. For example, let's assume company A's projected market cap is $275M. At the current risk-free rate (1-yr = 2.7%), the stablecoin entity would be earning $7,425,000 per year from the incurred interest. Because many valuation methods use earnings or cash flow, the value directly relates to the interest earned. It should be noted that companies with other forms of revenue may have earnings in addition to interest.

Fiat-Collateralized Token Benefits:

- **Simplicity:**
  Users easily grasp that their tokens can be redeemed for fiat currency at any time. Because of the 1:1 reserve, price stability is naturally maintained in the market.

- **Centralization:**
  Many supporters believe that it is easier for most to trust a service provider over a smart contract. In this model, accountability is held by a single entity. Furthermore, changes can be implemented easily and quickly.

Fiat-Collateralized Token Drawbacks:

- **Centralization**:
  A single point of failure makes the system risky. Centralization encourages corruption within the system. For example, the trustworthiness of Tether, a centralized system, has been called into question.

- **Slow Processing Time:**
  These services require anti-money laundering and know your customer compliance in countries such as the US. These services take time.

- **Risk of a Bank Run:**
  In a centralized reserve system, when individuals lose trust in the centralized entity, they will likely liquidate their asset. For example, negative publicity associated with Tether led to a mass sell off—resulting in heightened price volatility.

2.2.2. Type 2: Crypto-Collateralized Stablecoins

The second class of stablecoins are those collateralized with cryptocurrency. Unlike the first category, the collateralized asset for this category of stablecoins is highly volatile. Because of this, the value of the collateralized cryptocurrency has the potential to fall below the value of the stablecoin—at which point the stablecoin would also drop in value. For example, if a stablecoin is collateralized with Ethereum, it would need to have a collateralization ratio which accounts for this volatility—meaning the stablecoin must be overcollateralized. In other coins, it is not in fact a 1:1 to ratio for redemption, but one that is >1:1.

The most popular project using this framework is MakerDAO. To put it simply, the MakerDAO platform is a decentralized, autonomous organization where investors can generate Dai (a stablecoin) by locking up ETH in instruments called Collateralized Debt Positions (CDPs). MakerDAO uses a 150% reserve ratio (1.5 USDs of ETH to 1 USDs worth of Dai). If the total volume of collateral falls below this ratio, the system automatically starts selling MKR (which bear interest and grant voting rights) for Dai. This removes Dai from the system—pushing the ratio back up to a safe level.

While this suggestion does not bear the responsibility of investment advice, hypothetical projected returns for investors in this project could be calculated as follows:

(Interest on MKR tokens via closing of CDPs) * (percentage of yearly revenue) * (market cap of tokens) - (% dilution of MKR from undercollateralized CDPs).

Crypto-Collateralized Token Benefits:

- **Working PoC for Cryptocurrency Collateralization:**
  This maintains price stability in spite of a bearish market (further market instability will test this).

- **Built on Top of a More Mature Technology (Ethereum):**
  This allows for more mature developer tools and latitude for technological advancements in the future.

- **Market Validation:**
  A16z crypto fund (Andreessen Horowitz) purchased 15 million USD worth of MKR tokens (6% of total supply) demonstrating strong stewardship.

Crypto-Collateralized Token Drawbacks:

- **Lack of Accessible Collateral:**
  To create Dai, a CDP is needed to be created. This process requires locking up capital that is unaccessible (1/3 of capital required is taken out of circulation) to create a CDP.

- **Black Swan Events:**
  This describes a vulnerability to unpredictable market downturns that can be difficult to model. Examples of these black swan events include the the LTCM hedge fund crash and the software vulnerability that allowed a cybercriminal to steal $67 million in Ethereum from the DAO hack.

- **Technology Limitations:**
  Difficulty of scaling (limitations in throughput via core consensus protocol and nascence of layer 2 solutions, such as Raiden Network, as well as business integration).

- **Vulnerability to Oracle Manipulation:**
  Oracles must be heavily relied upon and trusted to feed the network accurate exchange rate information.

- **Downside Risks.**
  MKR holders also get stuck with the downside risks; if the system is not able to raise enough DAI to cover CDP's debt, then the MKR shares get diluted, and newly created tokens are needed to recover DAI to pay off the CDP debt.

2.2.3. Type 3: Uncollateralized Stablecoins

The third classification addresses fully algorithmic systems—a notable project is Kowala. These systems are not collateralized. Instead, they rely on a strong monetary policy to act as a fully algorithmic central bank. The algorithm maintains the stability of the coin by issuing new tokens when the supply is too low and by burning tokens when the demand is too low.

Investors purchase the promise of future tokens at a discount via bond tokens. Bonds are typically paid for using the platform's stablecoin—this is the mechanism by which the algorithmic central bank reduces the supply. When the algorithm must expand the supply, it issues tokens to bondholders. Bonds have a set expiration date at which point they no longer represent a future payment of stablecoins. Therefore, investors who purchase bonds are essentially betting that the demand for these stablecoins will outstrip supply before the expiration date. However, bonds and shares are fundamentally designed to make investors money. But with the obvious costs of selling securities, the popular Basis project disbanded. They have since promised to return the $133 million raised in its initial investment round with big backers, such as a16z crypto fund (Andreessen Horowitz), GV (formerly Google Ventures), Bain Capital Ventures, and Polychain Capital.

Uncollateralized Token Benefits:

- **Autonomous**: In the long run, uncollateralized stablecoins incur less centralization risk and greater revenue upside with a fully automated clearing house system
- **Scalability**: With the right conditions, a fully algorithmic system can scale to global demands of a currency more easily than other stablecoin models.

Uncollateralized Token Drawbacks:

- **Regulations**:
A designation for shares and bond tokens as securities carries heavy associated costs and regulations.

- **The Risk of Black Swan Events:**
Detrimental events that are hard to predict and describe effectively via algorithms or modeling techniques pose a threat to these forms of stablecoins. For example, the exploit in the Solidity scripting language that culminated in the DAO Hack of Ethereum where a thief stole $67.4 million in Ether, and the reliance on flawed financial modelling that led to Long Term Capital Management hedge fund implosion.

- Excessive Complexity of System (Rube Goldberg Machine): This makes it difficult to understand and may undermine the effectiveness of the stability mechanism, compounding the risk of a black swan event.

- Oracle Manipulation Concern: Similar to the issue associated with crypto-collateralized stablecoins, Oracles that feed exchange rate information may not be fully trustworthy

3. Five Use Cases of Stablecoins

The demand for stablecoins arises from the core advantages of stablecoins over their fiat alternatives. As discussed previously, some of these advantages include programmability, independence from traditional centralized systems, and non-physicality. Stablecoins offer the ability to capitalize on use cases where fiat currencies fall short. However, it is unlikely that one stablecoin will be dominant over all use cases. This is a result of the differences between various stablecoins themselves. As a result, there are many investment opportunities within the realm of stablecoins which flow from various use cases.

This section seeks to shed light on these investment opportunities by looking at five key use cases: safe haven assets on cryptocurrency exchanges, dollarization in emerging regions, peer to peer (P2P) and peer to business (P2B) payments, value transfer over smart contracts, and reserve currencies in an international context. As will be shown, these use cases vary in time frame, upside potential, and requirements from the individual stablecoins.

3.1. Use Case 1: Safe Haven for Traders

In order to avoid downside volatility, traders use "safe haven" assets. These assets are relatively stable, even when broader market prices fluctuate. In U.S. equity markets, when traders sell, they sell into USD. This point is often taken for granted. In crypto markets, when traders want to sell out of an asset which has appreciated, they have many options to sell into. In order to protect the gains made on a trade, traders often choose to sell into stablecoins.

As we can see from figures #3 and #4 below, during periods of high downside volatility, the trading volume of stablecoins significantly increases until stability returns. Further evidence of this finding is that six out of the top ten pairs (by 24-hour volume) contain a stablecoin (figure 5)—meaning that when people buy or sell, they do so with a stablcoin.

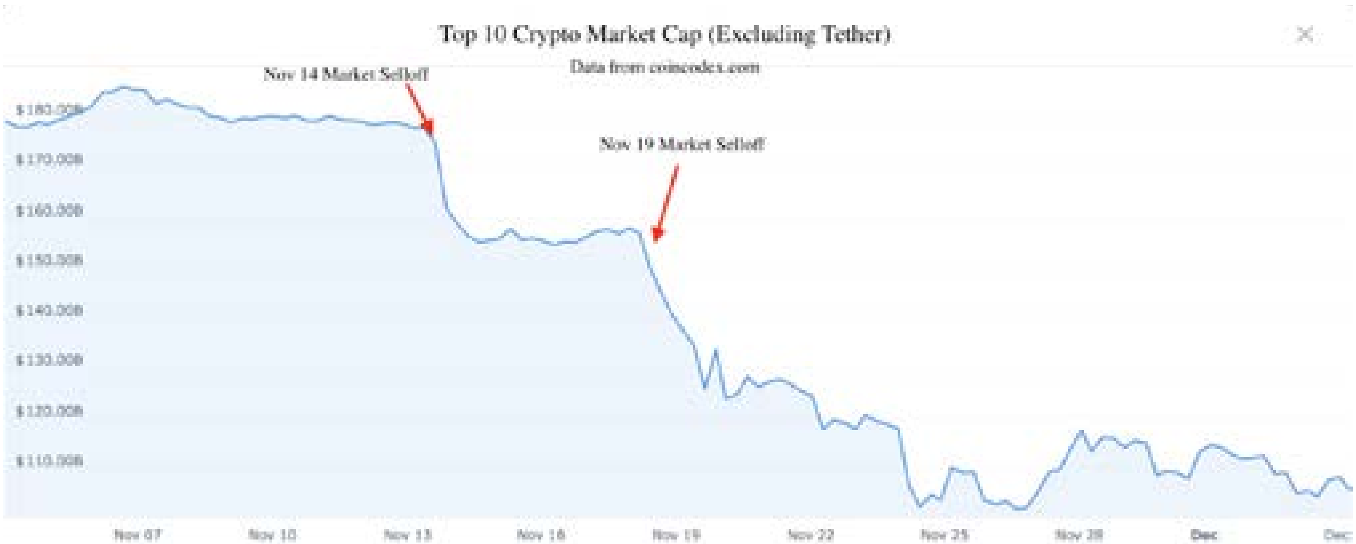

Figure 3: Top 10 Crypto Market Cap
(Data from coincodex.com)

Figure 4: TStablecoin Trading Volume
(Data from coincodex.com)

Top 10 traded pairs on Binance (by 24 hr volume)
(data from coinmarketcap.com)

1. Binance

#	Currency	Pair	Volume (24h)	Price	Volume (%)
1	Bitcoin	BTC/USDT	$166,303,542	$3,760.96	27.01%
2	Ethereum	ETH/USDT	$31,620,507	$103.46	5.14%
3	Bitcoin	BTC/PAX	$28,929,072	$3,758.32	4.70%
4	Binance Coin	BNB/USDT	$27,789,315	$5.95	4.51%
5	Waves	WAVES/BTC	$26,065,438	$1.90	4.23%
6	Binance Coin	BNB/BTC	$25,436,858	$5.96	4.13%
7	EOS	EOS/USDT	$20,485,056	$2.21	3.33%
8	XRP	XRP/USDT	$18,769,957	$0.340162	3.05%
9	Ethereum	ETH/BTC	$18,348,052	$103.74	2.98%
10	XRP	XRP/BTC	$13,770,433	$0.341245	2.24%

Figure 5: Top exchange pairs on Binance by 24h volume

Opportunity for crypto traders with stablecoins as safe havens.

Using a conservative estimate, exchanges around the world process ~$5.4 billion daily. Further, according to the Satis Group, crypto trading volume is expected to grow by over 50% through 2019. This projects the global crypto trading volume to be over $8 billion through 2019. This growth in trading will fuel the demand for stablecoins. Stablecoin companies have the opportunity to capitalize on this growth and improve where existing safe haven assets fail.

Traders who employ this strategy are looking for stability in their safe haven assets. We can understand why stability is important by looking at the example of Tether. If a trader used Tether during a period of downside volatility while it was priced at one of its highs ($1.08), the trader would be buying each unit of Tether at an 8% premium (Tethers real value is 1$). This would translate into a 7.4% overall loss of wealth once Tether's price stabilized ($1 is 7.4% less than $1.08). In this scenario, a $10,000 trade out of bitcoin would ultimately be worth only $9,260. Because perfect stability has not yet been reached, there is still a need in the market for better stablecoins. For example, Binance recently announced their plan to include trading pairs denominated in a basket of stablecoins. By spreading trading volume across multiple stablecoins, there is less pressure on any one asset—ultimately reducing volatility. Consequently, this further reduces the volatility of the safe haven asset as well.

Factors leading to success with stablecoins and exchanges.

Stablecoin companies listed on many exchanges (especially large ones) have a higher likelihood of success. This is because by being listed on many exchanges, they gain exposure to more traders, thereby capturing a larger market share and establishing a better network effect than stablecoin companies who are listed on a few small exchanges. Furthermore, being listed on many exchanges increases the likelihood of being included in a bundle of stablecoins (such as the Binance bundle). By being included in a bundle, the token is guaranteed higher volume (the number of trades that occur over a set period of time) which supports the liquidity of the token. Increased liquidity in an asset increases its price stability because when buy and sell orders at a given price are being settled quickly, the trader does not need to change their bid or ask price.

The use of a basket of stablecoins in a trading pair is meant to create an asset with more liquidity by spreading trading pressure across multiple tokens. By spreading pressure across multiple assets, exchanges reduce the risk of price volatility of the assets in the basket, thereby increasing the stability of the basket itself. That being said, if a stablecoin is even more stable than a basket of similar assets, that stablecoin would immediately become the preferred safe haven asset. Therefore, stability is an important factor with respect to being included in a stable basket and with respect to being a stand-alone safe haven asset.

3.2 Dollarization 2.0

Solving the problem of hyperinflation in developing countries.

In the year 2000, when the Ecuadorian Sucre had 96.1% inflation, the citizens of Ecuador turned to the USD to hedge against the inflation. The country began to unofficially accept the US dollar until the government decided to make a formal switch in the same year. With the adoption of the USD as the national currency, the financial markets stabilized. Citizens in countries whose currency has high inflation often turn towards more stable assets to protect their wealth and allow them to participate in commerce.

The process of a country using USD as a means to offset high inflation and local currency instability is known as dollarization. During dollarization, the population may or may not coordinate the adoption of a foreign currency with their local government. Despite governmental currency controls, populations may create black markets for physical USD. One such market can be found in Argentina, a country that had an inflation rate of greater than 45% in October 2018. Citizens of Argentina use USD in black markets as a currency hedge against the naira, their inflationary national currency. What if these assets were instead digitally native

Opportunities with stablecoins and Dollarization 2.0.

Dollarization gives countries suffering from hyperinflation a means to protect themselves against the rapid depreciation of their buying power. Cryptocurrencies extend this hedge and give citizens of these countries access to a safe haven asset. Furthermore, stablecoins can be introduced digitally, whereas USD must be imported by tourists. Developing nations are primed for stablecoin dollarization for multiple reasons.

- Onboarding Infrastructure: Whereas traditional financial inclusion requires banking infrastructure, stablecoin systems only require digital wallets (which can be housed on mobile phones). In Africa, for example, the number of unique mobile phone subscribers is projected to be 634 million by 2025 (52% penetration rate). These mobile phones can host digital wallets and give access to exchanges which list stablecoins. This, in turn, will infuse stable capital in their local markets. (The global penetration for mobile users is approximately 64.5%).

- Hedge against inflation: According to our analysis, 47.33% of Africa's population is experiencing inflation of over 10% (inflation data from 2018, population data from 2017). If stablecoins are able to maintain price stability and appropriate ease of access, they could be attractive means to hedge against the volatility of local currencies. According to Kate Mitselmakher, CEO of Bloccelerate:

"Consider the Zimbabwe dollar, for instance, which has suffered a staggering inflation of 500,000,000,000%. Many Zimbabweans have already turned to Bitcoin as a hedge against their national currency, thereby driving the Bitcoin price up on the local crypto-market. Creating a new cryptocurrency presents a viable solution for the Zimbabwean government to alleviate the bleak perception of its country's monetary challenges. "

- Ecosystem Support: An ecosystem which develops around stablecoins—such as entrepreneurs leveraging it as a their primary form of value exchange—is essential to stablecoin adoption. Emerging countries have an increasing opportunity to take advantage of this trend. For example, there are 6,000 startups in Africa, with over 150 having secured funding in 2017 (data from Crunchbase, Angel List, and Disrupt Africa). Therefore, this emerging market has incredible opportunity to adopt stablecoins for ease of doing business, low transaction fees, ease of access, and other reasons discussed above.

Factors leading to successful dollarization 2.0.

Some important factors which will drive success of dollarization in emerging regions are interface integration, appeal to businesses, user base trust, and compliance.

- **Interface Integration:** Integration with existing infrastructure is critical for mainstream adoption of stablecoins.

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Successful stablecoin companies must be able to develop relationships with existing digital wallet providers or develop their native digital wallet applications in their respective geographies.

- **Enterprise Adoption:** Enterprise adoption of stablecoins reduces the need for financial intermediation and improves the 'stickiness' of the stablecoin currency. The more heterogeneous the market of safe haven assets is, the harder it is for one particular stablecoin to gain traction. However, enterprise adoption of a particular stablecoin(e.g. as a payment mechanism), would greatly increase the adoption of such an asset.

- **Gaining User Trust:** Gaining user trust is the key prerequisite of broader market adoption. Therefore, stablecoin companies must find ways to communicate the value of their token. The more users buy into the underlying value of the asset, the higher adoption this particular asset will likely incur. For example, before 1971 when the USD was backed by gold, people could exchange convertibility notes (dollars) into gold. This practice was fairly common while people were still new to transacting with notes (as opposed to precious metal coins). Eventually, however, note-to-gold conversion waned as citizens began trusting the notes could be converted anytime.

- **Overcoming Regulatory Uncertainties:** Unfavorable regulation is likely the largest limiting factor for adoption. This is because an outlawed currency is unlikely to be accepted by enterprises and is unlikely to be listed on existing digital wallets. Many governments are opposed to dollarization for three reasons: Loss of seigniorage profits, reduced effectiveness in monetary policy, and loss of a sense of autonomy . By choosing regions with a favorable regulatory environment, stablecoin companies can mitigate the risks associated with negative regulation. Also, by working directly with governments to repay seigniorage losses or to rebrand as a government token would be effective ways to encourage positive regulation.

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[1] https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Implementing-Official-Dollarization-23800

3.3. Use Case 3: P2P and P2B Payments.

Opportunities for stablecoin adoption in the P2P and P2B use case.

According to eMarketer, only 1% of millennials use mobile payment (digital wallet) services as their primary source of payments (see figure 6). Furthermore, mobile payments are projected to have a CAGR of 33.8% through 2023. Stablecoin solutions have the potential to capture some of this growth.

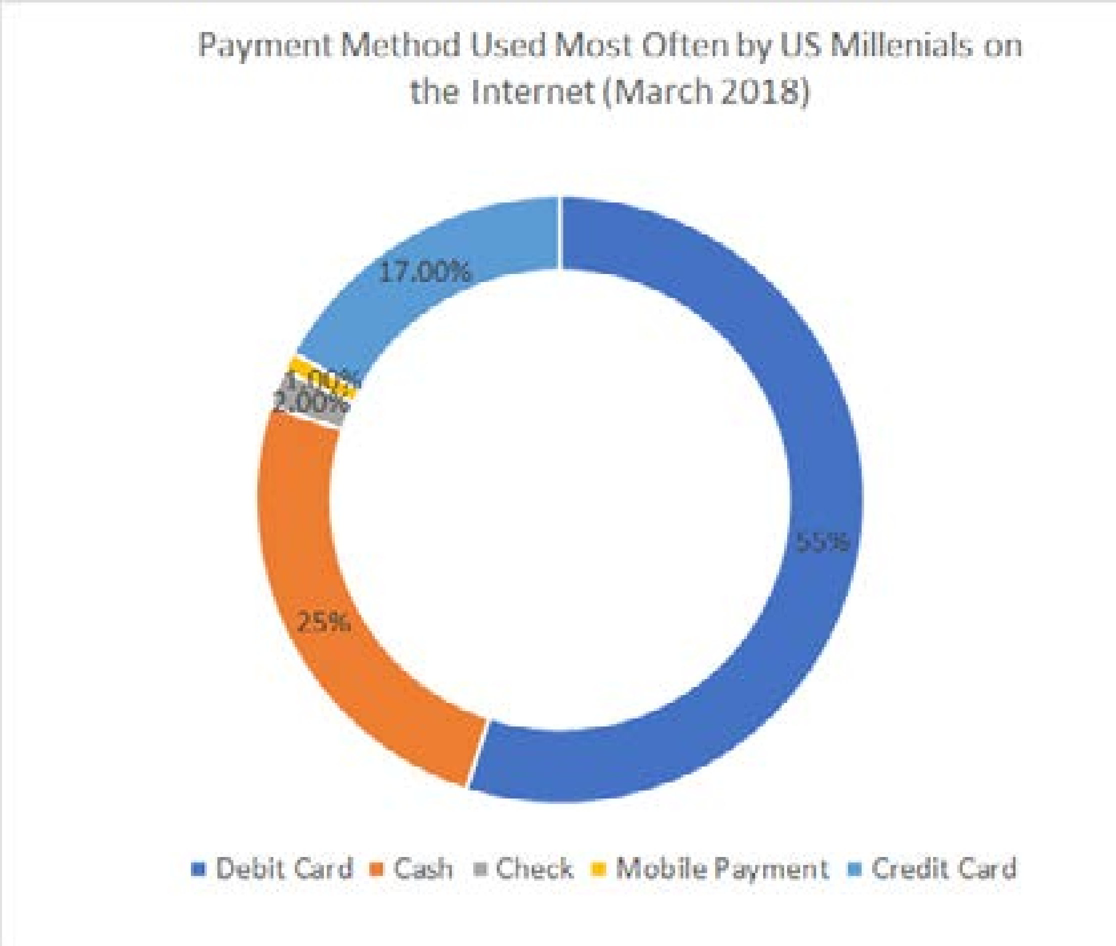

Figure 6: Payment Methods Chart (data from eMarketer.com)

Conventional digital payment companies make money by charging a fee to merchants (see figure 7). For example, Square Cash charges a 2.75% per transaction fee to merchants. Venmo charges a similar 2.9% of the transaction plus $0.3. A stablecoin company could potentially undercut this fee by leveraging blockchain to lower their own costs per transaction. Businesses could be incentivized to use a stablecoin solution in order to drive the profit margins.

	Paypal	Google Pay	Venmo	Square Cash	Apple Pay Cash
Compatibility	Android, iOS, Web	Android, iOS, Web	Android, iOS, Web	Android, iOS, Web	iOS
Payment methods	Credit, debit, bank transfer	Credit, debit card, bank transfer	Credit, debit card, bank transfer	Credit, debit card	Credit, debit card
Credit fee	2.9% + $0.30	2.9%	2.9%	3%	3%
Debit fee	2.9% + $0.30	Free	Free (25 cents for instant transfers)	Free	Free
Bank transfer fee	Free	Free	Free	N/A	N/A
Withdrawal speed	Up to 1-2 business days	Up to 1-3 business days	Up to 1 business day	Up to 1-2 business days	Up to 1-3 business days
Transfer limits	$10,000	$9,999	$3,000	$2,500	$3,000
Special features	PayPal.me shareable links	Integration with other Google services	Quick transfers to banks	No need to set up an account	Automatically available in iOS

Incremental improvements could be leveraged when targeting user groups who have specific preferences. For example, improved anonymity could be marketed to those demanding privacy in purchases. Loyalty points or rewards could be easily implemented when a P2B payment is made. In Europe, there is a significant need for borderless transaction solutions given the variety of currencies in close proximity. Frequent travelers may find the borderless qualities of stablecoins attractive.

Factors leading to success of adoption.

For mainstream adoption to occur, a stablecoin firm must either develop its native wallet or develop strong partnerships with existing wallets. The market for digital wallets is highly competitive. In the US, Venmo, Cash App, and Zelle dominate. In China, AliPay (520 million users) and WeChat Pay (800 million users) have reached mass adoption. In Europe, currency borders have hindered development. However, blockchain startup Circle (backed by Goldman Sachs) is gaining attention. Also, large companies like Apple, Google, and Facebook are now offering digital wallet solutions (Apple Pay, Google Pay, Facebook Messenger Payments).

Given the intense competition and demand for value-added digital wallets, introducing a new currency is not enough to drive adoption. In order to drive adoption, important factors are network effects and the leveraging of competitive advantages.

- **Network Effects:** Network effects are important for stablecoin companies because the number of users impacts how useful the currency is as a medium of exchange (see section 1.3). In the context of P2P payments, the utility of the stablecoin is a function of the number of people who use it to exchange value. As a result, stablecoin companies must find ways to incentivize participation. One way to help a network grow is to offer perks for joining (such as cash). Peter Thiel, the founder of PayPal, mentions in his book "Zero to One" a very similar logic about network effects which led him to pay customers to join the network.

- Leveraging of Competitive Advantage: Existing payment solutions in developed nations are not broken. As shown, the space is highly competitive and, as a result, stablecoin companies are unlikely to immediately gain significant market share in the broad payments domain. However, by targeting niche markets in which stablecoins and blockchain technology solve problems, stablecoin companies can acquire users who view the existing system as broken. For example, privacy concerned individuals who are hesitant to services, such as Venmo or PayPal, may be very attractive to pseudo-anonymous wallets or obfuscated public ledgers (like Monero). In these markets, stablecoin companies can leverage their competitive advantage to quickly gain users and build their network.

3.4. Use Case 4: Stablecoin Smart Contract Integration: Solving lockup volatility and widening the user base.

- Smart contracts are an innovative way to decentralize and create efficiency gains for common everyday transactions. The benefits of using smart contracts are wide-ranging (for more in-depth information on the use cases of smart contracts, see here). Smart contract adoption is still in its early stages because smart contracts are mostly only compatible with highly volatile cryptocurrencies. This creates two limitations: smart contract users are mostly people who are risk-tolerant and comfortable with cryptocurrencies and smart contracts require capital lock up, which creates risk when capital is highly volatile and subject to wild fluctuations.
- Stablecoins can expand smart contract use beyond that of the early adopter audience and into that of a mainstream audience. This is because a crypto asset pegged to a familiar unit of account (e.g. USD) is more palatable to users who may be wary of cryptocurrencies. Because stablecoins are both price stable and have the ability to interact with smart contracts, they overcome the significant challenge of volatility risk associated with using smart contracts. To better illustrate how stablecoins enable the smart contract space, imagine the dynamic of a tenant and landlord.

- Imagine Jill is leasing a house to Jack. Traditionally, Jill would bill Jack on a monthly basis for the right to live in the house. In this example, a smart contract could be used to replace the lease by maintaining the legal documents allowing Jack to live in the house if—and only if—he pays. Furthermore, the smart contract could execute agreements in the lease, such as utility bills and maintenance. While smart contracts could greatly improve the current process, the problem is that they are only compatible with cryptocurrencies. Since proprietary tokens and major cryptocurrencies are very volatile in price,it's unlikely that Jill would agree to a lease denominated in these assets given her potential losses associated with the volatility.

- On the flip side, stablecoins offer a way to avoid this volatility while also being smart contract compatible. If the leasing smart contract was programmed to accept a stablecoin, Jill could be certain that the value of the payment would not depreciate before exchanging the token for fiat. The applications go way beyond leasing services— banks can use smart contracts for mortgage payments, companies can use smart contracts to pay employees, prediction markets can be created, and much more.

Factors driving growth and success for stablecoins in smart contracts.

The following factors are driving the growth of stablecoin adoption within the context of a smart contracts use case.

- **Cross-platform Compatibility:** Currently, the smart contract space is nascent and few useable products have been created. In the future, however, successful smart contracts will be developed on multiple blockchain platforms. This is because different platforms have different characteristics. A smart contract developer will take this into account when determining which platform is best suited for their application. Stablecoin companies that deploy their token on multiple platforms will maximize their market penetration by increasing their exposure to many smart contracts.

- **Building Trust:** A trustable token is one in which users have confidence that they can redeem it for fiat. Fiat-backed stablecoins with a strong brand, a good track record, and transparent audits already possess this value proposition. Crypto-collateralized stablecoins, such as DAI, however, face some criticism regarding the instability of the underlying cryptocurrency peg—such as Ethereum,which has lost 90% of its value in 2018. As skepticism for cryptocurrencies and smart contracts decreases, the opportunity for non-fiat-backed models to take dominance will emerge.

3.5. Use Case 5: Stablecoins as Reserve Currency

The current status of central bank reserves.

Governments and banks around the world hold reserve currencies which are low in volatility and highly liquid in order to reduce risk in their wealth. This is very similar to the hedge against volatility known as safe havens. In 1971, much of the world held USD as their reserve currency, since it was pegged directly to gold until Richard Nixon ended this system. Today, the USD is still the de facto reserve currency for most of the world, which currently stands at 57% of the world's reserve composition, according to the IMF (figure 8).

This fact causes many benefits to accrue to the US . As a result, other nations may seek to reduce dependence on USD and increase the international use of their own currency. For example, China recently released oil futures which are denominated in RMB. Furthermore, China's Belt and Road Initiative, a one to eight trillion dollar infrastructure plan, is meant to facilitate international trade denominated in RMB.

This system also grants the U.S. the ability to exercise control over the global trade system. For example, the US recently made a unilateral decision to impose sanctions on Iran by coercing the dominant international settlement system (SWIFT) to exclude Iran. This has caused many American allies to realize the need for a change in the status quo. The German Foreign Minister, Heiko Maas, proposed a payment channel independent of the U.S. in order to protect European companies from legal sanctions.

Furthermore, the International Monetary Fund (IMF) has clearly stated their goal of reducing sovereign currencies as reserves (figure 9). In 2010, the Strategy, Policy, and Review Department of the IMF published a document entitled "Reserve Accumulation and International Monetary Stability", which outlines the risks associated with one nation having outsized control over reserves, saying that members of the fund should have the objective of "...making the Special Drawing Right (SDR) the principal reserve asset in the IMS [International Monetary System]."

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[2]
1. Much of the world's trade is denominated in USD. This causes outsized foreign demand for USD.
2. Because of the demand for USD, there is a deflationary effect (strengthening) on USD.
3. The US government counteracts this effect by weakening the dollar. It achieves this by expanding the money supply through buying bonds (this also lowers interest rates on bonds because interest rates have an inverse relationship with price, which goes up due to the government-injected demand).

This system has multiple benefits which accrue to the US:
1. By putting more dollars in circulation, the government holds more interest bearing bonds which give them profits (this is called seigniorage).
2. At an artificially low interest rate, the government can borrow more cheaply.
3. The U.S. is at less exchange risk than other nations because they do not need to exchange currency before purchasing goods which are already denominated in USD.

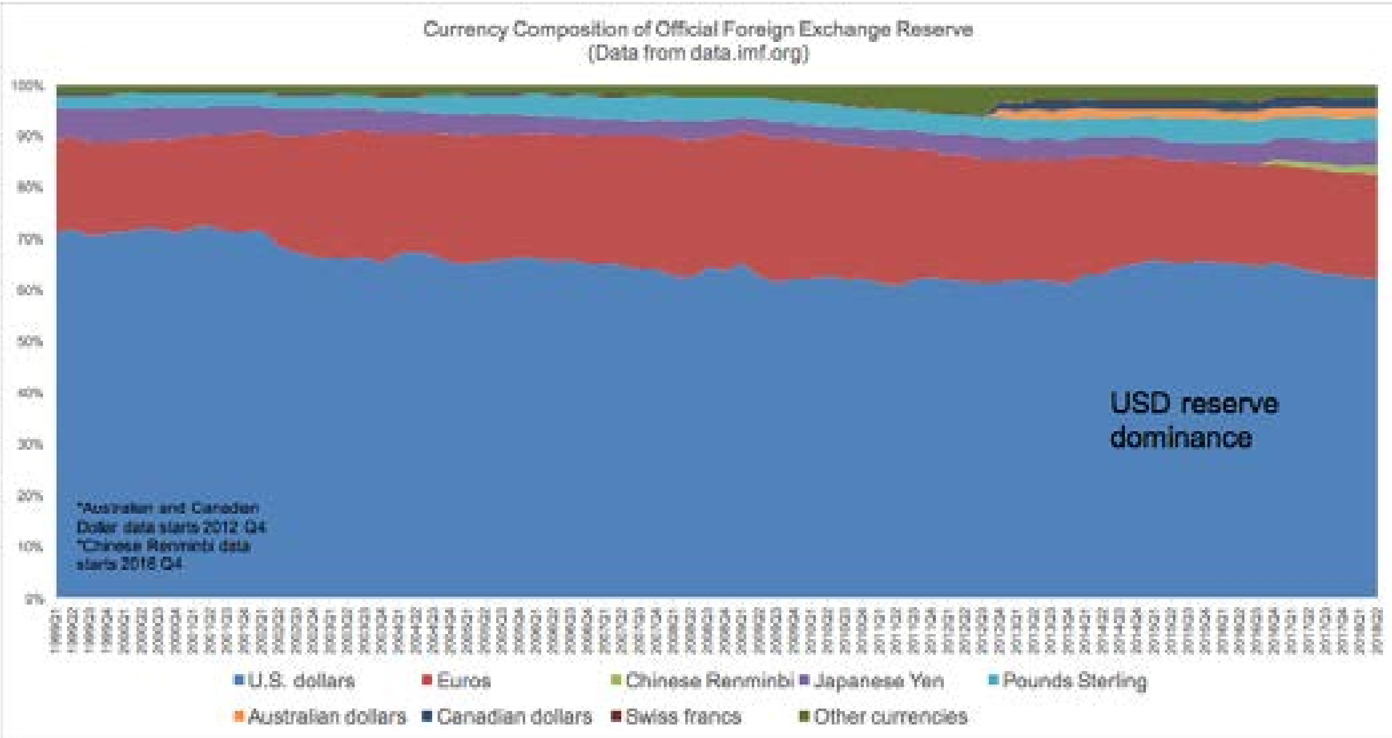

Figure 8: Currency Composition of Official Foreign Exchange Reserve (Data from data.imf.org)

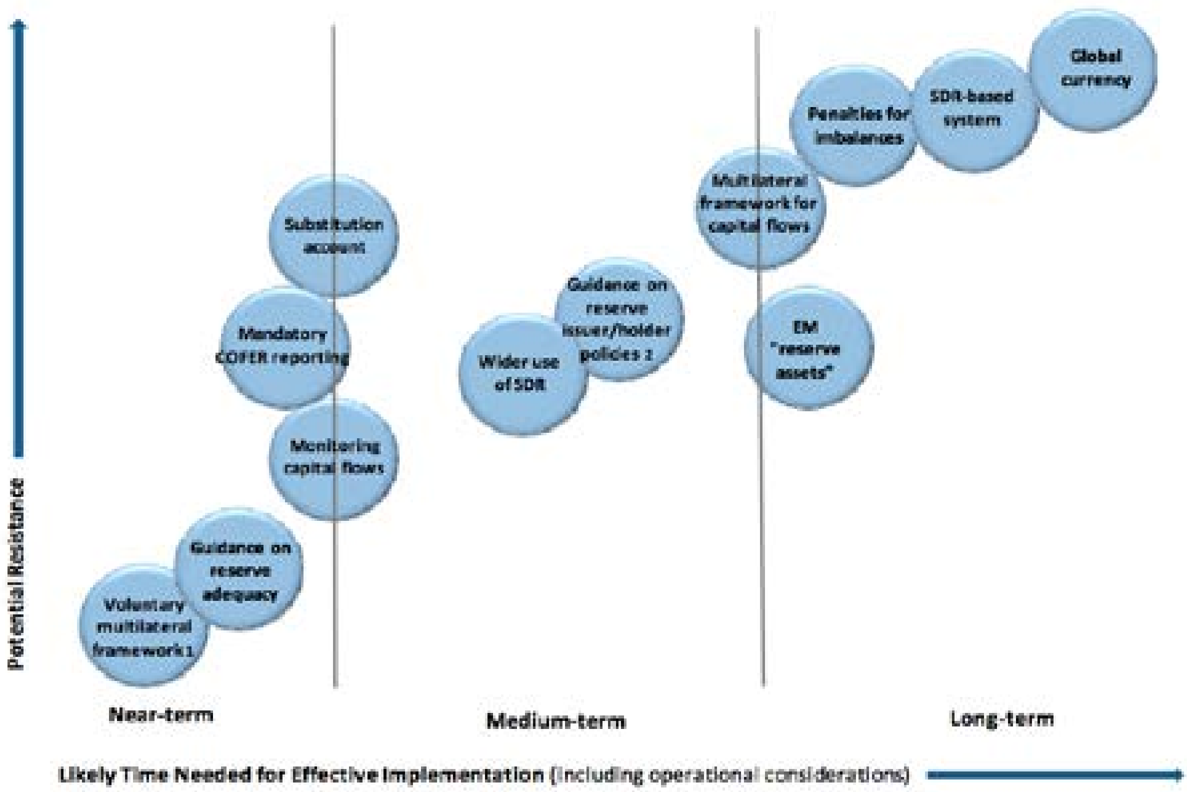

Figure 9: Ideas to Mitigate Demand and Diversify Supply of Reserves for IMS Stability

Opportunity for Stablecoins to be Reserve Currencies

Based on the IMF's goals, China's efforts to usurp the reserve throne, and the E.U.'s efforts to establish an alternative to the US dominated SWIFT system, there are many reasons to believe that USD dominance may fade in the long term. There is little predictability in regard to how fast this will happen, or which nation's currency (if any) will gain dominance. As a result, investors may seek to hedge against this shifting power dynamic by placing funds in an asset outside of the system altogether. This creates an opportunity for stablecoin companies who are developing assets that exist outside of these systems. There are a few types of stablecoin projects that can offer reduced exposure to these systems:

- **Diversification of Collateral:** By being pegged to a basket of currencies, a stablecoin project could spread the risk of correlation to any one single currency. For example, because Tether is backed fully by USD, if the US suddenly experiences hyperinflation, the value of USDT would fall in tandem with USD. Compare this to Globcoin (GLX), which is backed by a basket of 15 currencies and gold. When USD experiences hyperinflation, the value of GLX only falls by a fraction because it is diversified.

- **Algorithmic Central Bank:** A stablecoin whose stability is maintained through an algorithmic central bank is not reliant on existing monetary systems for its value. As a result, its purchasing power would not decrease—even in the case of an international government meltdown. Currently, however, projects in this category, such as MakerDAO, are pegging the value of their token to a fiat currency. This is being done in order to kick-start the token's use as a unit of account (see section 1.3).

- **Non-traditional Collateralization:** Stablecoin projects which are backed by assets with inherent value are somewhat protected from the above systems. For example, intellectual property (IP) is valuable in itself;as the value of a fiat currency fluctuates, the price of IP would rise and fall to reflect a constant underlying value.

- **Crypto-Collateralization:** Stablecoin projects collateralized by other crypto-assets may exist outside of the current monetary system in that their underlying token exists outside of the current monetary system. For example, Maker DAO issues DAI stablecoins when users deposit Ethereum. Currently, DAI are pegged to USD, but eventually, voters on the system may choose to peg DAI to a basket of goods, or to drop the peg entirely.

Factors driving growth and success for stablecoins.

It is important to note that the opportunity to use stablecoins as a hedge against global reserve currencies is primarily targeted for the long term. It is unlikely that the dynamics of international trade will shift a great deal in the near term. Nor is it likely that governments and banks will feel comfortable holding crypto assets in their reserves to manage risk until private and institutional investors begin to do so. That said, we can estimate the factors which will be influential in a stablecoin's success given a changing central bank reserve environment.

- **Non-correlation:** Some ways to ensure non-correlation to existing monetary systems are diversification, use of an algorithmic central bank, use of non-traditional collateralization, and use of crypto-asset collateralization. Currently, stablecoins are pegged to established units of account. If this does not change, any investor who holds these tokens is still exposed to the risks associated with the currency it is pegged to. Therefore, the stablecoin companies which are best positioned to take advantage of this opportunity are companies that have viable plans to become their own unit of account.

- **Black Swan Resistant:** Stablecoins which do not utilize at least a 1:1 reserve mechanisms are at risk of black swan events (see Models of Stablecoins section above). Algorithmic central bank and decentralized models must be proven over long periods of time before people will believe they are secure from hacking, algorithm errors, or underlying asset volatility.

Projects such as MakerDAO anticipate that they will be able to drop their peg to USD. For this to happen, they must be trusted as a meaningful unit of account by their user base. In the medium term, it is likely that projects will emerge that are well-positioned to be their own unit of account—making it fully uncorrelated. This asset would have huge market potential given investors' need to diversify.

Conclusion

The current state of stablecoins is one of opportunity for founders and investors alike. However, a great deal of thought must be put into the driving factors of adoption for a given stablecoin. Stablecoin companies cannot simply expect that their token will receive mass adoption without careful targeting of specific user bases. By looking at various use cases of stablecoins, we can identify multiple opportunities that companies can capitalize on. These opportunities vary in time frame as wells as factors that drive success.

Use Case	Factors	Adoption Timeframe
Dollarization	Number of useful businesses accepting currency, consumer trust, government regulation	Medium-Long term (5-10 years)
Smart Contracts	Compatibility with Smart Contracts, consumer Trust	Short-Medium (1-5 years)
Exchange Safe Haven	Liquidity, number of exchanges listed on	Short term (<1 year)
P2P/P2B payments	Number of users, number of digital wallets, number of useful businesses accepting currency	(Medium term 1-5 years)
Reserve Currency	Uncorrelated with Fiat, black swan resistance	Long term (10+ years)

Stablecoin companies that understand their target audience will be able to create and enable new services. As Andy Milenius, CTO of MakerDAO, postulates, these services will act in the same magnitude as mp3 encoding. By integrating with many blockchains, stablecoin startups will gain exposure to the value creation on multiple smart contract platforms. Moreover, by being listed on well-designed digital wallets, stablecoin companies will position themselves as an on-ramping service to the world of cryptocurrency, and more and more people will turn to digitized value exchange. By maximizing the number of exchanges they are listed on and by ensuring price stability, stablecoin companies can increase use as a safe haven for crypto traders and general consumers. By maximizing the number of businesses that accept the token and by pursuing user trust, companies can increase their chances of adoption in developing countries. By maximizing liquidity and by minimizing correlation to sovereign currencies, stablecoin companies can also offer value as a fiat hedge.

Given the momentum and added benefits of digital money on the blockchain, stablecoin adoption is almost inevitable. With successful stablecoin projects, we will see a more secure and borderless world. In the future, the infrastructure for instantaneous settlement similar in function to FedWire, a service that banks use to interact with the Federal Reserve, will be distributed to all businesses across the world. We will inhabit a future where mainframe-based Automated Clearing House (ACH) settlement systems are retired, and, because of this, transaction costs will be lowered for small businesses and dollarization will be expanded. Central banks will wire funds directly to individual wallets and thereby cutting out expensive intermediaries.

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