RMI Assessment Report Note

Assessing USDMI: A Digital Sovereign Bond Backed by US Treasuries

Executive Summary

In February 2024, the Cabinet of the Republic of the Marshall Islands authorized an assessment of the opportunities and risks related to issuing a digital sovereign bond backed by US Treasuries in the form of a yield-bearing stablecoin. This Research Note is the result of that assessment.[1]

The Opportunity

Today, many Marshall Islands citizens lack easy access to financial services. This isn't just an RMI problem; it's a problem for billions of people worldwide.

Stablecoins provide a partial solution. Stablecoins are blockchain-based digital assets whose value is 1:1 redeemable for US dollars held by an issuer in a bank. People hold Stablecoins to store wealth and make payments on the blockchain without being subject to the volatility of cryptocurrencies like Bitcoin.[2] For many, US-dollar stablecoins protect them from runaway inflation in their domestic currencies.

Today, people worldwide hold over $170 billion in USD-backed stablecoins, up 54% over the past nine months since the Cabinet authorized this report. Researchers project the market could grow another 10x by the end of the decade.[3]

This Research Note:

- Explains USDMI
- Provides historical and market context for USDMI.
- Estimates the revenue opportunity for the RMI.
- Delineates a regulatory framework
- Analyses the risk factors of issuing USDMI.
- Provides a cost-benefit analysis of issuing USDMI.

[1] This is a living document, updated as feedback is received. The most recent version is available at https://docsend.com/view/gtrm8hv9up4hfr7x.

[2] Stablecoins are used for many different purposes. Roughly ⅓ are held in individual wallets, unused for the last 30 days. These are likely used as savings. Roughly ⅓ are held in individual wallets and have been transferred in the last 30 days. These are likely used for payments. Roughly ⅓ are held in exchanges and other financial applications. These are likely used for trading. https://www.forbes.com/sites/digital-assets/2024/03/29/stablecoins-what-are-they-used-for/

[3] CoinDesk (Jun 2023). First Mover Americas: Tokenization Might Be a $5T Opportunity: Bernstein. Accessed October 2024. https://www.coindesk.com/markets/2023/06/20/first-mover-americas-tokenization-might-be-a-5t-opportunity/

However, stablecoins don't generate any yield for their holders. Instead, the issuer invests the cash into US Treasuries and keeps the interest for themselves. Issuers have earned ~$8.5 billion in the last year alone from short-term US Treasuries yielding ~5%.[4]

Private entities are attempting to address this opportunity by offering yield-bearing stablecoins, which are legally structured as digitized interests in private funds that hold US Treasuries. They have sold $2.27 billion of these tokens (up 300% from $750 million nine months ago). However, private issuers who distribute yield are subject to many regulatory restrictions. For example, in the US, they are only issuable to those who can prove they are Accredited Investors (individuals with a net worth over $1 million, excluding primary residence or income over $200k in each of the prior two years). That would preclude issuance to the Marshallese diaspora in the US, which provides substantial remittance flows into the RMI, but at a high cost of approximately 10%.

In contrast, sovereign issuers receive privileged regulatory treatment that could allow yield distribution to anyone. That means tokens could be freely transferable, like a stablecoin, but pay interest like a private fund holding US Treasuries. If a sovereign nation were to take a 1% cut of the prevailing ~5% interest rate on short-dated US Treasuries (TBills) and distribute the remaining ~4% to all stablecoin holders, it would imply a $1 billion annual revenue opportunity. The first country to pursue this opportunity will have a significant advantage over others, which means the window of opportunity is slight. Already, Palau has announced a pilot for a blockchain-based savings bond. If the RMI wants to capitalize on this opportunity, it must move quickly.

The Risks

All new initiatives have risks. In this report, we break risks into three types: (1) Risks that the project fails commercially, (2) Risks that would impact the broader RMI economy, and (3) Risks that the RMI would lose money. For each, we grade the probability of the risk occurring, consider mitigants, and calculate a severity score. Finally, we apply a risk matrix to each risk factor to provide an overall risk analysis for the issuance.

This analysis identifies and classifies eight low-risk factors, eight moderate-risk factors, zero high-risk factors, and zero extreme-risk factors. Across these instances, to the extent risks are present, well-understood and relatively straightforward mitigations are available. Specific recommendations and courses of action to address each are laid out in detail.

Notably, the highest probability risk the recommended approach faces is a commercial failure. However, we applied a low severity rating to this potential outcome so long as it would not result in financial loss to the RMI. This is because the RMI retains the right to dissolve USDMI and return funds to bondholders at any time. As a result, while commercial failure without financial loss to the RMI would be regrettable, the outcome would simply be equivalent to the status quo.

The Cost-Benefit Analysis

Financial access is a significant driver of poverty alleviation and GDP growth. Already, stablecoins are held in 125 million unique wallets owned by people around the world.[5] Bringing a savings product to RMI citizens and billions of people worldwide would provide important, valuable benefits.

In addition, the upside for the government is substantial. The largest stablecoin issuer, Tether (USDT), reported an annualized net profit of $10 billion across the first half of 2024. In terms of revenue per employee - with a headcount of just 160 - it is currently one of the most profitable companies in the world. If USDMI were to launch and capture only 0.5% of the market share, the revenue opportunity would be $4 million, growing to $70 million by 2028. Capturing 2.5% of the market share would be worth $21 million

[4] https://home.treasury.gov/resource-center/data-chart-center/interest-rates/TextView?type=daily_treasury_bill_rates&field_tdr_date_value=2024
[5] As of October 16, 2024. https://app.rwa.xyz/stablecoins

in revenue, increasing to $350 million in 2028. Capturing 10% of market share would be worth $85 million in revenue, growing to $1.4 billion in 2028. Section 4: Market Size & Revenue Opportunity contains a full analysis.

USDMI is a significant revenue opportunity that, after being assessed through a comprehensive risk framework, carries only a moderate level of risk, including a low risk of financial loss accompanied by clear mitigation opportunities and procedures to protect the broader economy. In particular, the RMI can implement the same regulatory framework currently used by the US and actively monitor the results of these efforts. If they do, the risks should be straightforward to mitigate.

In totality, analysis indicates that the benefits outweigh the costs.

Conclusion

For the RMI specifically, USDMI offers to address several needs at once. First, it provides a savings and financial access instrument for RMI citizens. Second, it provides a less expensive way to send remittances or distribute UBI. Third, it generates revenue for the government.

For the world, it offers the potential of similar benefits for billions of people. It is relatively rare to identify opportunities with potential upside of this magnitude paired with well-understood, classifiable, and manageable risks. They are rare, in part, because they are quickly seized upon. In this instance, a first-mover advantage is still available and ideally suited to be capitalized on by a small, nimble, and responsible sovereign.

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1. Background on Bonds

1.1 Background on Sovereign Bonds

What Are Bonds?

Bonds represent a loan made by an investor to a borrower (usually a corporation or government). Typically, borrowers issue bonds when a direct loan is too large for a single investor. Instead, the loan is subdivided into many small loans, each identical and transferable. This enables investors (the lenders) to resell bonds on secondary markets as they please. The Issuer decides on the size and repayment schedule of their bonds, and the interest rate is typically set through a public auction or negotiated in a private placement. If the risk of the issuer defaulting is high, the issuer usually must offer a higher interest rate to attract lenders. When the risk of defaulting is low, the issuer can offer a lower rate.

What Are Sovereign Bonds?

Sovereign bonds are bonds issued by a sovereign state. They can be denominated in domestic or foreign currency, like the US Dollar.

Why Sovereign Bonds Are Issued

Nations typically issue sovereign bonds to support government spending. This can come into play when nations have opportunities to invest in infrastructure, healthcare, security, or other government services that will generate economic growth, but they need more upfront capital to do so. If economic growth materializes, it can generate additional tax revenues that could more than pay the cost of servicing the debt. Sometimes, sovereign debt is also issued out of political expediency or practical necessity to bridge budget deficits, even if it won't generate economic growth.

Examples

The largest sovereign bond issuer in the world is the United States, with $33 trillion outstanding. The prevailing interest rate on Treasuries is considered the "risk-free rate" since a US default is considered the least likely risk in the world of investment. Other large issuers include China ($15 trillion outstanding) and Japan ($11 trillion outstanding). The UK, France, Italy, India, and Germany each have about $3 trillion outstanding. The smallest issuers are the countries of Oceania. Palau and Tonga each have $200M outstanding. Micronesia has $100M outstanding. Nauru, Kiribati, and Tuvalu have under $100M outstanding.[6] In the past, the RMI has issued a sovereign bond secured by money due from the US.

Size and Trends of the Market

The sovereign debt market is the oldest and largest bond market in the world, with $97 trillion in outstanding sovereign bonds. It has grown 40% since 2019.[7]

1.2 Background on Collateralized Sovereign Bonds

Collateralized sovereign debt is backed by an existing asset or future income stream owned by the sovereign state. The terms of the debt specify that in the event of a default, the creditor obtains ownership of the collateral.

Collateral can take many forms. Resource-backed loans use physical commodities like oil, gold, diamonds, cocoa, etc. Collateralized Future Receipts use future revenue from infrastructure such as toll revenue, port docking fees, or committed export oil deliveries.

[6] International Monetary Fund. (2023). Accessed Oct 2024. Retrieved from https://www.elibrary.imf.org/view/journals/002/2023/349/article-A003-en.xml#:~:text=Total%20debt%20service%20amounted%20to,Resort%20to%20fund%20renovation%20works

[7] Visual Capitalist. (2023). Accessed Oct 2024. Retrieved from https://www.visualcapitalist.com/97-trillion-of-global-debt-in-2023/

Other forms of collateral include ownership in a state-owned enterprise, foreign equities, or another country's sovereign bonds. Collateral can also include other bonds, like US Treasuries.

Why Collateralized Bonds Are Issued

Governments tend to issue collateralized bonds when lenders aren't willing to provide financing at low enough interest rates (or at all). Collateral limits the losses to lenders in the event of a default, making them more willing to offer financing at lower rates.

Often, collateral is used on loans that are denominated in foreign currencies, like USD. Lenders like USD-denominated loans because they transfer inflation and foreign exchange risk onto the sovereign state. However, a sudden deterioration of public finances due to economic downturn, trade shocks, currency devaluation, foreign exchange instability, etc. can leave the sovereign state unable to pay. In those cases, the collateral can cover losses.

Sometimes, a large lender may insist on specific collateral for strategic reasons. For example, Chinese state-owned banks are by far the largest lenders of collateralized sovereign bonds. Often, they want to ensure the capital is used for specific infrastructure projects that will facilitate trade with China (e.g., mines, oil pipelines, etc.). Collateralizing a loan with specific natural resources or commodities can force the borrower to use the capital to extract those resources to ensure they can repay the loan. Oil is the most common commodity used as collateral.

Examples

The first modern collateralized sovereign bond was issued in the mid-1990s by Angola, collateralized by oil exports. Kazakhstan's state-owned KAzMunaiGas issued a $5 billion oil-backed loan to China National Petroleum Corporation.[8] In 2016, Venezuelan state oil company PDVSA pledged 100% of its shares in US subsidiary Citgo as collateral for two loans comprising $3 billion. Citgo owns refineries, a network of terminals, pipelines, and gas stations across the US.[9]

Resource-backed loans (RBLs) between 2004 - 2008[10]

Country	RBL Total Value (USD)	Lenders
Angola	24 billion	6
Brazil	25 billion	5
Chad	1.96 billion	2
Democratic Republic of Congo	3.5 billion	2
Ecuador	13.8 billion	7
Ghana	25.6 billion	5
Guinea	20 billion	1
Niger	1 billion	1
Republic of Congo	6.1 billion	5
São Tomé and Príncipe	30 million	1

[8] LiveMint. (2013). China buys into giant Kazakh Oilfield for $5 billion. Accessed Oct 2024. Retrieved from https://www.livemint.com/Companies/d1ck3jDaP2MCtMI1wdfzBM/China-buys-into-giant-Kazakh-Oilfield-for-5-billion.html

[9] Reuters. (2016). Venezuela's PDVSA uses 49.9 pct Citgo stake as loan collateral. Retrieved from https://www.reuters.com/article/idUSL1N1EI1FO/

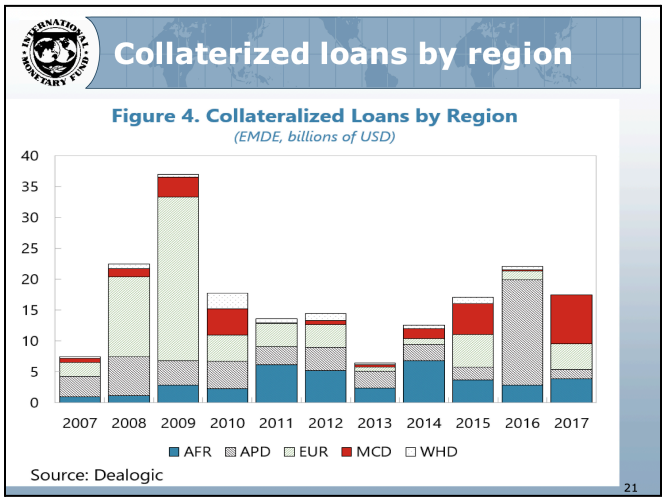
[10] African Forum and Network on Debt and Development (AFRODAD). (2023). Resource-Backed Loans and Public Sector Collateralisation of Natural Resources in African Countries. Retrieved from https://afrodad.org/wp-content/uploads/2023/01/Resource-Backed-Loans-and-Public-Sector-Collateralisation-of-Natural-Resources-in-African-Countries.pdf

South Sudan	1.2 billion	3
Sudan	3 billion	1
Venezuela	59 billion	10
Zimbabwe	408 million	3

Figure 1.1

Size and Trends of the Market

There are no comprehensive public datasets on other regions. The IMF has published data on collateralized borrowing from emerging and developing markets (EMDE), but it is not comprehensive and excludes unknown privately placed bilateral arrangements.[11] Researchers have cataloged $164 billion in collateralized sovereign loans in Latin America and Sub-Saharan Africa.[12]



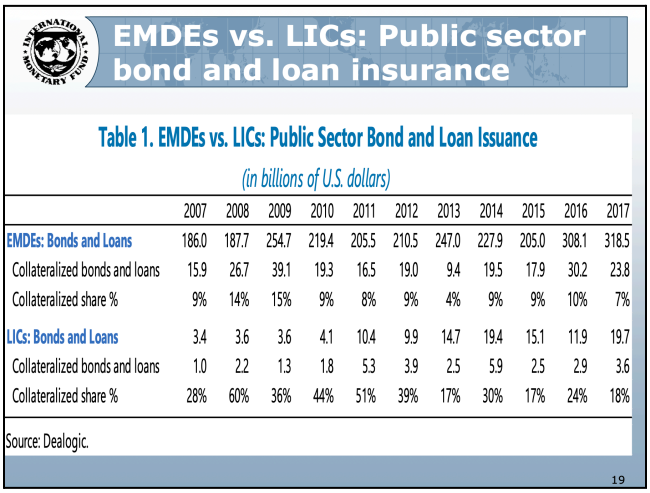


Figure 1.2 and Figure 1.3

Note: EMDE = "Emerging Market and Developing Economy" | LIC - "Low Income Country"

1.3 Background on Brady Bonds

A Brady Bond is a type of collateralized sovereign bond that is denominated in USD and uses US Treasuries as collateral.[13] Brady Bonds were initially issued in the late 1980s by emerging market countries. The collateral is held in the United States, such that if the issuing country defaulted the lenders could redeem the collateral in a neutral jurisdiction. The bonds were named after US Treasury Secretary Nicholas Brady, who proposed the structure.

Why Brady Bonds Were Issued

In the 1980s, a sovereign debt crisis led many emerging market countries to default on debt. The holders of their debt were largely US Banks, so it also risked precipitating a US banking crisis. US Treasury Secretary Nicholas Brady proposed a plan by which international banks would partially forgive the loans and accept a lower interest rate on repayment of the remainder. In exchange, the debt would be redenominated in US dollars, and collateral would be purchased and posted against the remaining balance by a combination of the IMF, World Bank, and issuing country. The collateral was specially issued 30-year, zero-coupon US Treasury

[11] Imam, P. (2019, August). Collateralized Sovereign Debt - Costs and Benefits. International Monetary Fund, Africa Department.
[12] International Monetary Fund. (2023, September). Collateralized Transactions: Recent Developments and Policy Considerations.
[13] https://en.wikipedia.org/wiki/Brady_Bonds. Accessed Oct 2024.

bonds. This structure also made the bonds similar enough to be traded more easily in financial markets, allowing banks to sell them more easily if needed.

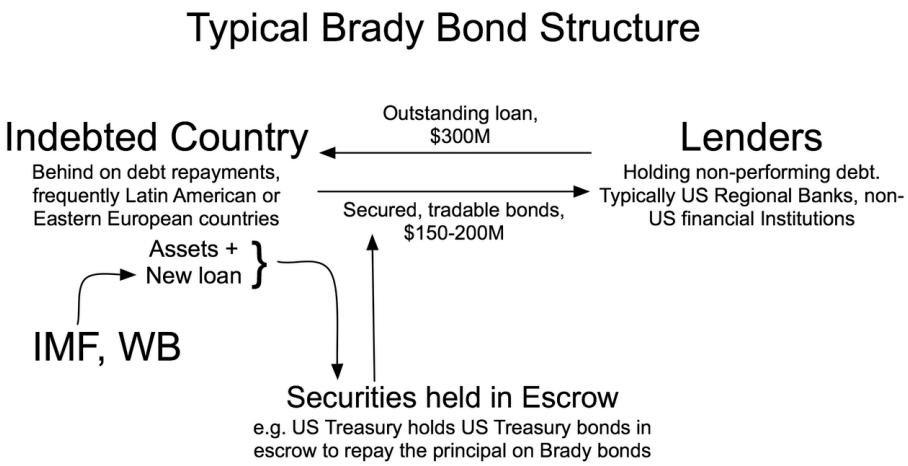


Figure 1.4

Examples[14]

Billions of dollars of Brady Bonds were issued, including the following countries:

Figure 1.5

Size and Trends of the Market

While Brady Bonds are no longer widely used, there are still two Brady Bonds outstanding. Vietnam has a Brady Bond that matures in 2028, and Albania's $225 million Brady Bond matures in 2025.

[14] https://bondvigilantes.com/blog/2023/03/the-last-lonely-brady-bonds-would-more-make-sense/. Accessed October, 2024.

1.4 Background on Private Funds of Sovereign Bonds

Private funds of sovereign bonds are private investment vehicles that offer indirect exposure to sovereign bonds. For example, instead of purchasing a single US Treasury, an investor would invest in a private bond fund that purchases a mix of Treasuries that mature after six months, 12 months, ten years, and 20 years. When each matures, the fund manager administers the purchase of a replacement. Alternatively, an investor may invest in a fund that buys a diversified mix of sovereign bonds, such as those from emerging markets. Bond funds typically have very narrow mandates and charge relatively low fees to cover their administrative overhead.

Why Private Bond Funds Are Issued

While many investors, especially US persons, can purchase US Treasuries directly from treasurydirect.gov, it is often administratively complex to purchase and manage a large basket of different bonds. It is even harder to purchase foreign bonds. Private funds facilitate this process by providing a more seamless experience for investors, in addition to which funds can provide diversification via exposure to a variety of foreign bond issues. Examples of these types of funds are US mutual funds and ETFs holding foreign sovereign bonds.

Examples

Private Funds of Sovereign Bonds	
Private Fund of Sovereign Bonds	**Assets**
iShares International Treasury Bond ETF (IGOV)	$1 billion
SPDR Bloomberg International Treasury Bond ETF (BWX)	$1.1 billion
SPDR Bloomberg Capital Short Term International Treasury Bond ETF (BWZ)	$173 million
Franklin Liberty International Aggregate Bond ETF (FLIA)	$427 million

Figure 1.6

Size and Trends of the Market

As of June 2023, there were over 900 bond ETFs globally, constituting almost $1.9 trillion in total assets under management. The US Treasuries has the biggest bond ETF market, with the largest category being US Treasuries ($417 billion). Despite seeing rapid growth, bond ETFs still only make up ~ 1% of the global bond market.[15]

[15] https://www.google.com/finance/quote/IGOV:NASDAQ

2. Background on Digitization

2.1 Background on Digitization of Financial Assets

About Digitization

Digitization means that the authoritative record of ownership of each unit of an asset is managed on a distributed blockchain ledger rather than on a traditional ledger stored on a central computer operated by the issuer. Managing the records of ownership on a distributed database has several advantages. First, holders transferring the asset get instant confirmation of settlement. Second, third-party applications can more easily integrate with them for payments, exchange, and other financial use cases.

Digitization can be likened to Computerization, which is the shift prompted by the introduction of computers several decades ago. At that time, records of ownership managed with pen and paper were gradually computerized. Today, computerization is standard, and its many benefits are obvious. That process was also often referred to as "digitization," but we refer to it as "computerization" to distinguish it from the current wave.

International consulting firm Boston Consulting Group estimates that up to 10% of global GDP will be digitized (tokenized) by the end of this decade.

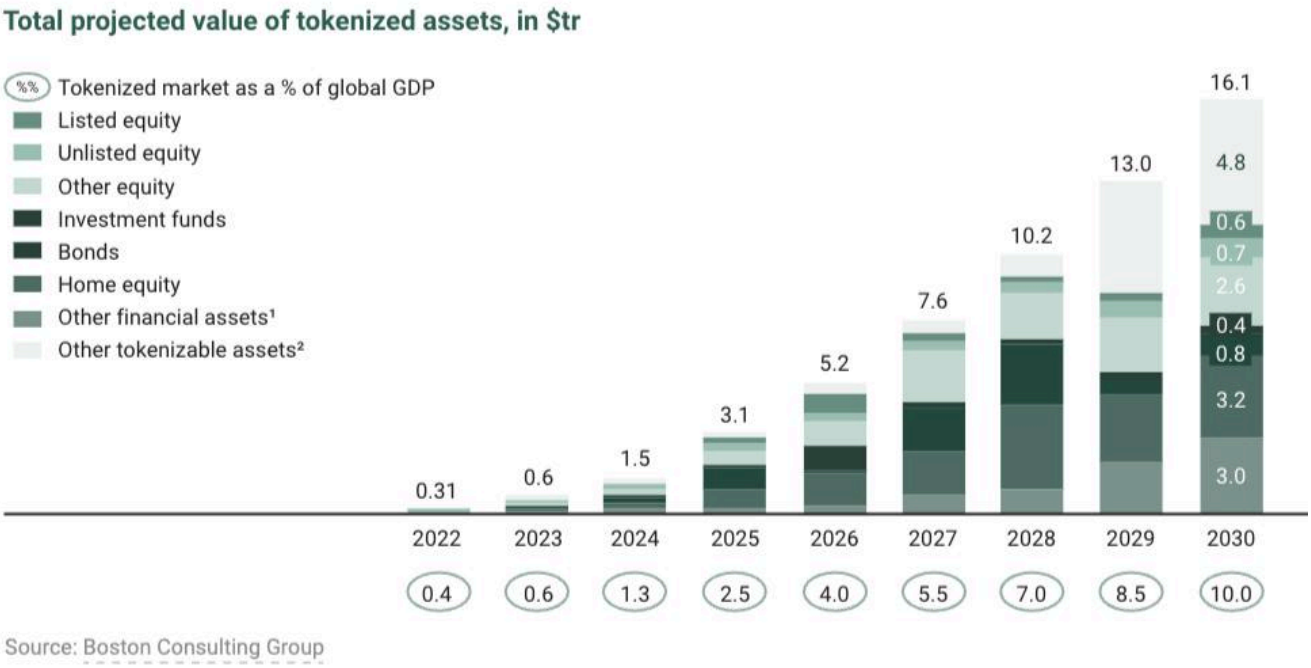


Figure 2.0

2.2 Background on Digital Dollars (Stablecoins)

USD stablecoins are fungible tokens issued on a public blockchain (e.g., Ethereum) that are 1:1 redeemable for US dollars from an issuer's bank account.

Why Stablecoins are Issued

Stablecoins are used for several different purposes. They are the dominant form of payment within the crypto economy because they hold a constant value and are dollar-denominated. Research shows roughly ⅓ are used for this purpose. In addition, many people want to use cryptocurrency to hold their wealth (temporarily or permanently) but do not want exposure to the volatility that most cryptocurrencies carry; stablecoins serve as a stable store of value. Research shows roughly ⅓ are used for this purpose. Finally, many financial applications, such as cryptocurrency exchanges, quote trading pairs in stablecoins for ease of reference and stability. Research shows that a final ⅓ is used for this purpose. [16]

Examples

The largest stablecoin is USDT (Tether), with $119 billion outstanding. The next largest is USDC, with $35 billion outstanding. Paypal has issued a stablecoin, and several entities issue stablecoins on behalf of third-party entities like Paxos.

Stablecoins			
Stablecoin	**Issuer**	**Outstanding**	**Regulator**
USDT	Tether	$119 billion	Bahamas
USDC	Circle	$35 billion	US Treasury (FinCen)
Paxis	Paxos	$870 million	UAE
PYUSD	Paypal	$724 million	New York (US) DFS
(49 Others)	Various	$15 billion	Various

Figure 2.1

Size and Trends of the Market

As of writing, $171 billion in stablecoins have been issued on public blockchains, with over $1 trillion transferred each month. This is up 34% from one year ago.[17]

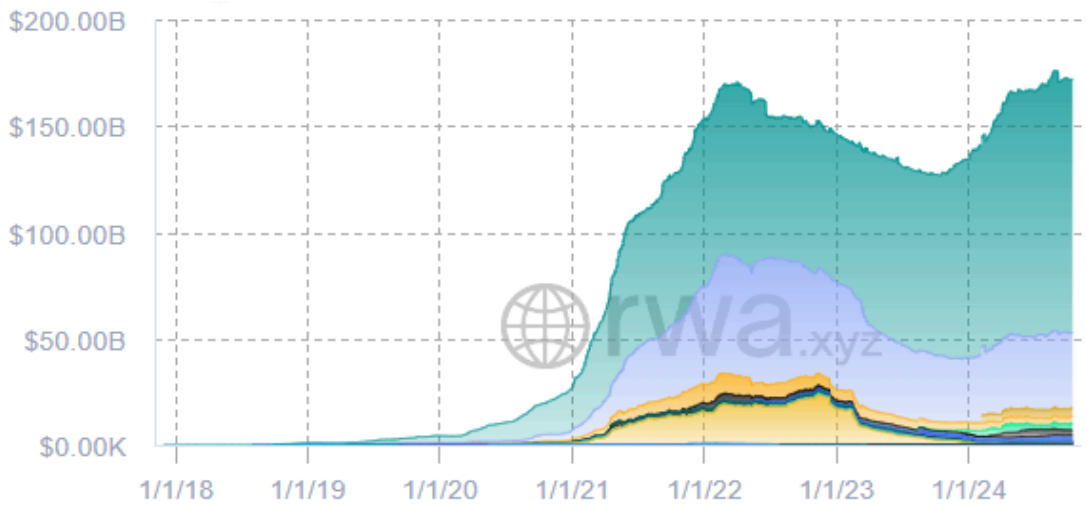


Figure 2.2[18]

[16] https://www.forbes.com/sites/digital-assets/2024/03/29/stablecoins-what-are-they-used-for/ (Accessed October, 2024).
[17] CoinGecko. Stablecoins. https://www.coingecko.com/en/categories/stablecoins (Accessed October 2024)
[18] https://app.rwa.xyz/stablecoins (Accessed October, 2024)

Investment research firm Bernstein predicts the stablecoin market will grow to $3 trillion in the next five years.[19]

2.3 Regulation & Compliance for Digital Dollars

Regulatory Regimes

Stablecoins are regulated under various jurisdictions and agencies. The US Treasury (FinCen) regulates Circle, the company behind USDC, as a money services business (MSB). The widely-respected New York Dept of Financial Services regulates Paxos and GMO-Z, the company behind ZUSD. The European Union recently passed its Markets in Crypto Assets (MiCA) legislation, which delineates the regulatory requirements for stablecoins. The Bahamas regulates Tether.

Primary Purchase Requirements

Issuers must KYC their direct counterparties. Typically, these counterparties are regulated wholesale institutions like exchanges and market makers. In turn, these wholesale institutions engage in secondary transactions with retail customers.

Secondary Purchase Requirements

Issuers are not required to KYC secondary transfer recipients. That is typically the responsibility of the sender and receiver of each transaction. For example, exchanges are required to KYC their users. Businesses are generally required to KYC counterparties they pay over a certain threshold (e.g. $10k).

Secondary Market Monitoring

Issuers are responsible for monitoring secondary transfer activity at a high level, which can be observed on the blockchain. This process is facilitated by software providers like Chainalysis, CipherTrace, and TRM Labs. At the request of law enforcement, Issuers can freeze and seize tokens involved in illicit activity. For example, in July 2023, Circle and Tether froze over $65 million in stablecoins stolen from a well-known DeFi product.[20] Circle has frozen other assets at the behest of law enforcement, like a $100k seizure in 2020.

The Bottom Line of Compliance

The core proposition of stablecoins is that they can generally be used like cash. Anyone can send stablecoins to anyone else without seeking permission in advance. Issuers are responsible for monitoring and flagging suspicious activity and supporting law enforcement (a capability that normal cash does not have).

2.4 Background on Digital Bonds

What They Are

Digital bonds (also known as “smart bonds” or “blockchain bonds”) are bonds for which ownership is tracked on a blockchain.

Why Digital Bonds Are Issued

Issuing and trading traditional bonds is slow and complex with many intermediaries and transaction costs. By managing the ownership of bonds on the blockchain, the process can become much more efficient, improving market efficiency.

[19] https://www.coindesk.com/markets/2023/08/09/stablecoin-market-to-grow-to-almost-3t-in-next-5-years-bernstein/ (Accessed October, 2024)
[20] Cointelegraph. (2023, July). Circle Freezes Over $65M in Assets Transferred from Multichain. Retrieved from https://cointelegraph.com/news/circle-tether-freezes-over-65m-in-assets-transferred-from-multichain (Accessed October, 2024)

Examples

Traditional financial institutions are eagerly experimenting with the technology. Here are some examples:

Digital Bonds Issued by Major Financial Institutions			
Issuer	**Date Announced**	**Par Amount**	**Blockchain**
AXA IM (France)*	Dec 4, 2023	EUR €5m	Ethereum
World Bank via Euroclear (Luxembourg)*	Oct 24, 2023	EUR €100m	Private Blockchain
ABN AMRO (The Netherlands)*	Sep 12, 2023	EUR €5m	Polygon
Siemens*	Feb 14, 2023	EUR €60m	Polygon
Societe Generale*	Apr 15, 2021	USD $6m	Tezos
See an exhaustive list of 39 others in Appendix D			

Figure 2.3

Size and Trends of the Market

$9 billion of smart bonds have been issued on the blockchain to date, growing at over 120% per year.[21] Citi and Bernstein anticipate $5 trillion of assets to be digitized on the blockchain within the next decade.[22]

2.5 Background on Private Digital Treasuries (Tokenized Treasuries)

Private Digital Treasuries are not actually digital treasuries, but rather digital interest in a private fund of sovereign bonds (see Section 1.4 Background on Private Funds of Sovereign Bonds). Private Digital Treasuries offer cryptocurrency holders around the world a way to buy sovereign bonds to generate returns on otherwise idle stablecoins. These funds are typically composed of ~10% bank deposits to meet short-term redemption requests and 90% short-term U. Treasuries.

Why Private Digital Treasuries are Issued

Since the US has not yet issued Treasuries on the blockchain, Private Digital Treasuries provide the people who use crypto with exposure to sovereign bonds via purchasing an interest in private funds that in turn invest in US Treasuries. However, these assets are subject to a variety of regulatory constraints that inhibit usage.

Examples[23]

Despite these constraints, Private Digital Treasuries are growing fast. Within four months of launch, Blackrock's BUIDL grew to over $500 million in Assets Under Management (AUM).

Digital Private Treasuries (Oct 2024)				
Smart Bond Fund Name	**Assets**	**Ticker**	**Yield**	**Fees**
BlackRock USD Institutional Digital Liquidity Fund	$522 million	$BUIDL	Unknown	0.5%
Franklin OnChain US Government Money Fund	$437 million	$FOBXX	5.11%	0.15%

[21] CoinDesk (Jun 2023). First Mover Americas: Tokenization Might Be a $5T Opportunity: Bernstein. https://www.coindesk.com/markets/2023/06/20/first-mover-americas-tokenization-might-be-a-5t-opportunity/ (Accessed October, 2024)

[22] Citi (March 2023) MONEY, TOKENS, AND GAMES: Blockchain's Next Billion Users and Trillions in Value. https://ir.citi.com/gps/MG9DEWhoYvQJVWLM9Kr3%2BZmqjoztKJcyNHr83F9Wug2pzAGHPQKfp23RAMrkNts%2FJitXoTNqufOvegUjjXh0IA%3D%3D

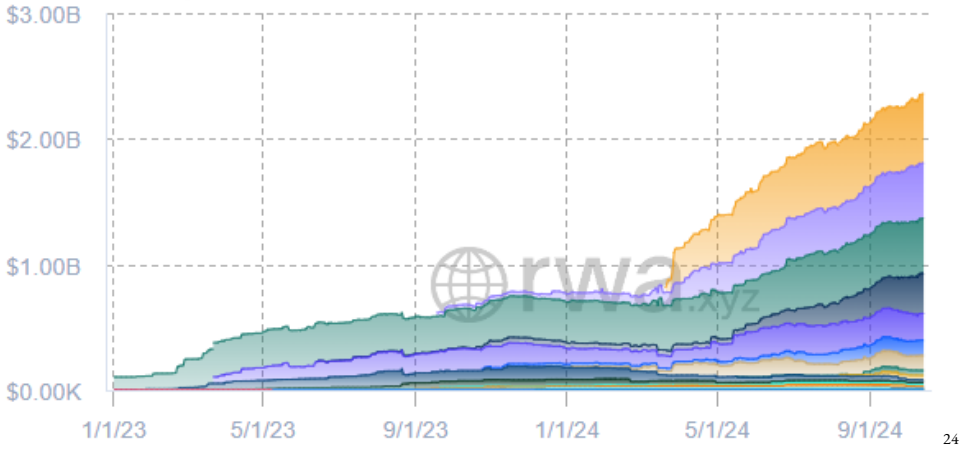
[23] Data table from Rwa.xyz, January 10, 2024.

Ondo US Dollar Yield	$419 million	$USDY	Unknown	Unknown
Hashnote Short Duration Yield Coin	$302 million	$USYC	4.7%	Unknown
Ondo Short-Term US Government Bond Fund	$221 million	$OUSG	4.68%	0.15%
OpenEden TBILL VAULT	$128 million	$TBILL	5.3%	Unknown
See Appendix E for a comprehensive list with 28 additional bonds totaling $835 million.				

Figure 2.4

Size and Trends of the Market

Private Digital Treasuries have grown 325% to $2.2 billion, up from $675 million one year ago.



[24]

Figure 2.5

2.6 Regulation & Compliance of Private Digital Treasuries

Regulatory Regimes

In this report, we focus only on US and EU laws. Private Digital Treasuries are classified as private securities under US law. They implicate the Securities Act of 1933, the Investment Company Act of 1940, and the Investment Advisor Act of 1940. As such, they are subject to SEC oversight in the US. Private Digital Treasuries are also classified as private securities under EU law. They implicate the Markets in Financial Instruments Directive II (Directive 2014/65/EU), also known as MiFID II. As such, they are subject to the oversight of member states of the EU.

Primary Purchase Requirements

In the US, issuers that rely on exemptions to registration must also verify that any US persons are accredited investors or qualified purchasers, which requires financial diligence, including reviewing bank statements. Otherwise, issuers must file a registration statement with the SEC, which no issuer has successfully done to date. In the EU, issuers that rely on exemptions typically cannot issue units worth less than $100,000. Otherwise, issuers must file a prospectus with an EU member state.

Secondary Purchase Requirements

In the US, issuers that rely on exemptions must KYC all recipients of secondary transfers to ensure that, if the recipient is a US person, they are accredited investors or qualified purchasers. As a result, issuers maintain permissioned allowlists of all verified

[24] https://app.rwa.xyz/treasuries (Accessed October 2024)

addresses. Any transfers to non-verified addresses will fail. In the EU, secondary transfers are more permissive, but denominations tend to be prohibitively high for practical use with retail investors.

The Bottom Line of Compliance

Private Digital Treasuries offer yield, but the compliance frictions deter eligible buyers and make them completely inaccessible to everyone else.

2.7 Background on Digital Sovereign Bonds

A digital sovereign bond is a digital bond that is issued by a sovereign state. As described previously, digital bonds are bonds for which ownership is tracked, and payments are administered, on a blockchain's distributed ledger.

Why They Are Issued

Issuing digital sovereign bonds can "reduce costs, shorten the duration issuance and clearing of government bonds, improve transparency and mitigate risks," according to the Israeli team piloting a blockchain-based Israeli sovereign bond. [25]

The Republic of the Marshall Islands 1995 issuance is an instructive example. After months of work by underwriters, the admin costs totaled ~30%, and the RMI government received only ~70% of the principal. Issuing bonds on a blockchain could dramatically decrease the time and cost associated with sovereign bond issuances.

Examples of Government-Issued Blockchain Bonds

Examples of Government-Issued Blockchain Bonds				
Jurisdiction	**Govt Type**	**Date**	**Amount**	**Notes**
Hong Kong[26]	Municipal	Feb 2024	$753 million	"Green Bond"
Hong Kong[27]	Municipal	Feb 2023	$100 million	"Green Bond"
Philippines[28]	Nation	Nov 2023	$270 million	First Nation
Israel[29]	Nation	Ongoing	Pilot	"Project Eden"
Lugano (Swiss)[30]	Municipal	Jan 2023	$108 million	Swiss City
Basel-City (Swiss)[31]	Municipal	4Q 2023	$120 million	Swiss Canton
Zurich (Swiss)[32]	Municipal	4Q 2023	$120 million	Swiss Canton

[25] Reuters. (2022, October). Israel Eyes Government Bond Issuance via Blockchain Technology. Retrieved from https://www.reuters.com/markets/asia/israel-eyes-government-bond-issuance-via-blockchain-technology-2022-10-19/

[26] Hong Kong monetary authority Press Release (2024, February). Retrieved from https://www.hkma.gov.hk/eng/news-and-media/press-releases/2024/02/20240207-6/

[27] Hong Kong Monetary Authority (HKMA). (2023, February). Retrieved from https://www.hkma.gov.hk/eng/news-and-media/press-releases/2023/02/20230216-3/

[28] Bloomberg. (2023, November). Philippines Sells $270 Million of Maiden Tokenized Bonds. Retrieved from https://www.bloomberg.com/news/articles/2023-11-20/philippines-sells-270-million-of-maiden-tokenized-bonds

[29] Global Government Fintech. (2022, October). Israel to Pilot Issuance of Digital Government Bonds on Blockchain. Retrieved from https://www.globalgovernmentfintech.com/israel-to-pilot-issuance-of-digital-government-bonds-on-blockchain/

[30] Global Government Fintech. (2023, January). Swiss City Issues Blockchain Bond. Retrieved from https://www.globalgovernmentfintech.com/swiss-city-issues-blockchain-bond/

[31] PR Newswire. (2023, December). Swiss Cantons Basel-City and Zurich Pioneer the Settlement of Digital Bonds Transactions in SNB's Swiss Franc (WBBC) on SIX Digital Exchange. Retrieved from https://www.prnewswire.com/news-releases/swiss-cantons-basel-city-and-zurich-pioneer-the-settlement-of-digital-bonds

[32] PR Newswire. (2023, December). Swiss Cantons Basel-City and Zurich Pioneer the Settlement of Digital Bonds Transactions in SNB's Swiss Franc (WBBC) on SIX Digital Exchange. Retrieved from https://www.prnewswire.com/news-releases/swiss-cantons-basel-city-and-zurich-pioneer-the-settlement-of-digital-bonds

El Salvador[33]	Nation	Q1 2024	$1 billion	“Volcano Bonds”‵
Palau[34]	Nation	Oct 2024	Unknown	“Savings Bond”

Figure 2.6

Size and Trends of the Market

Sovereign states first issued digital bonds in 2023, totaling $718 million across five issuances by the end of the year. Many countries around the world are currently piloting their own digital bonds. El Salvador has passed legislation and finalized regulatory approval for the largest digital bond to date, at $1 billion, to be launched in early 2024.

Regulatory Regime

Each country defines its domestic regulatory regime. However, most countries are likely to align their regimes with those of the US so they can tap into demand from US investors.

[33] Barron’s. (2023, December). El Salvador To Issue Bitcoin Bonds In First Quarter Of 2024. Retrieved from https://www.barrons.com/news/el-salvador-to-issue-bitcoin-bonds-in-first-quarter-of-2024-b507729c (Accessed October, 2024)

[34] https://finance.yahoo.com/news/palau-launches-blockchain-based-savings-090300583.html (Accessed October, 2024)

3. A Digital Brady Bond

A Digital Brady Bond would be a combination of the established concepts above. Financially, it would be equivalent to a Private Digital Treasury, which means sharing yield from and collateralized by US Treasuries. Legally, it would be equivalent to a Digital Sovereign Bond. Regulatory oversight would be equivalent to a Digital Dollar.

Such an instrument could outcompete stablecoins by paying yield while holding an advantage over Private Digital Treasuries because it is freely transferable.

3.1 The Purpose is Access & Revenue, Not Financing

In contrast to standard sovereign bonds, the purpose of the USDMI is not to raise debt capital that requires repayment. Instead, the objective is (a) to expand access to financial services to a broader swathe of the population and (b) to generate revenue for the state by taking a portion of the interest generated by the US Treasuries.

3. The Structure

All proceeds from USDMI purchases would immediately be sent to a trust entity incorporated in the US, which would purchase short-dated US Treasuries (TBills) held by a regulated qualified custodian. The Trustee would be directed to pay interest to bondholders equivalent to a discount from US Treasury rates. If the Sovereign went bankrupt, the bondholders would receive the collateral directly ("bankruptcy remote"). This is a relatively standard structure for collateralized bonds. This is analogous to how Brady Bonds worked.

The trust would rely on a regulated institutional custodian to hold the actual US Treasuries. Custodians are heavily regulated, and many are banks. For example, Bank of New York Mellon custodies $43 trillion in assets for many financial institutions around the world. The custodian ensures the safekeeping of the assets.

3.3 How the Token Works

Each unit of USDMI would be worth exactly $1 because it would be redeemable for $1 US Dollar, just like a stablecoin. To purchase USDMI, buyers would simply wire $1 from their bank account to a segregated US bank account of the government of the RMI (or directly to the Trust). Alternatively, the buyer could transfer one stablecoin to the RMI, which it could then convert to USD in its bank account). Each day, the Trust would invest all the funds in short-dated US Treasuries. To redeem a token, holders could send 1 USDMI back to the RMI (or Trust), which would then wire $1 to their bank account or send back one stablecoin. Interest income would be distributed ratably and in kind to all wallets holding tokens.

From the user's perspective, the balance of the token held in their wallet would gradually and continuously grow. No conversion is necessary to make payments for USD-denominated goods and services. In crypto, this is referred to as a rebasing stablecoin. Other form factors may have slightly different technical characteristics and provided in parallel.

3.4 How the Technology Works

"Issuing" USDMI consists of deploying a ledger on the blockchain (also known as a "Smart Contract" utilizing "Distributed Ledger Technology"). The ledger would include a log of the unique wallet addresses of all bondholders, along with the number of units held by each. The ledger logs every transfer.

The RMI would maintain certain administrative permissions over the ledger entries. In particular, they would be able to create and destroy units of the bond. In addition, the RMI would have the capability to freeze transfers from a specific wallet and seize units from a specific wallet for law enforcement purposes. This functionality is standard for stablecoins.

The administrative privileges are controlled by a cryptographic key that the RMI would custody in a secure environment, likely utilizing Amazon's high-security "Amazon Web Services (AWS) Key Management Service."[35] Billions of dollars of stablecoins are secured by this service today. See Section 7: Risks for further discussion of cybersecurity issues.

3.5 Financial Obligations of the Sovereign Issuer

In order to qualify as a Sovereign Bond and receive favorable regulatory treatment around the world, USDMI needs to be guaranteed by the full faith and credit of the Government of the RMI. In practice, losses should be near impossible because the US Treasuries that serve as collateral are risk-free. Regardless, we analyze this risk in Section 7: Risks.

3.6 Competitive Analysis

A Digital Brady Bond would combine the best elements of stablecoins with the best elements of Private Digital Treasuries.

Digital Instrument	Digital Brady Bond	Stablecoins	Private Digital Treasuries
Freely Transferable	✔	✔	X
Pays Interest	✔	X	✔

Figure 3.1

3.7 Treatment Under US Law

Under US law, sovereign bonds are securities subject to the Securities Act. The premise of US Securities law is that before selling securities to the public, an issuer must file a registration statement with the SEC that includes comprehensive disclosures. It also requires ongoing information filings. The intent of the Act is not for the SEC to pass judgment on whether the security is a good investment, but rather to ensure that all material information is disclosed so that investors can make a reasonable judgment for themselves. This prevents fraud.
There are several exemptions to the requirement to register, but they all come with constraints, such as restricting sales to Accredited Investors (high net-worth individuals, roughly speaking).

The filing process for private issuers is difficult and intense. Currently, the forms and requirements do not accommodate the unique characteristics of instruments issued on the blockchain. As a result, no private issuer has successfully registered a freely transferable blockchain-based securities offering.

However, sovereigns are entitled to a streamlined registration process called Schedule B, which has different forms and requirements. The RMI may be able to register USDMI under Schedule B successfully. If it does, then it can be issued directly to US retail (subject to a compliance program, of course).

3.8 Treatment under European Union Law

Under EU law securities are subject to the Markets in Financial Instruments Directive II (Directive 2014/65/EU), also known as MiFID II, as well as Prospectus Regulation (EU) 2017/1129. Like the US, issuers must file a prospectus with a member state of the

[35] https://aws.amazon.com/kms/ (Accessed October, 2024)

EU before issuing securities to the public (approval of only one member state is typically required to issue in most other EU states). In many ways, this mirrors the US approach.

There are certain exemptions from the prospectus requirement. For example, bonds where individual units are over $100,00 do not have to file a prospectus. The assumption is that such bonds would only be practically purchasable by sophisticated institutional investors, thereby protecting the public.

Unlike the US, there is precedent for a private issuer of a freely transferable crypto security successfully filing a prospectus with Lichtenstein. Like the US, the prospectus burden for sovereign issuers is streamlined and lighter.

The European Union also recently passed the landmark Markets in Crypto Assets (MiCA) regulation, which explicitly governs stablecoins. However, MiCA explicitly excludes any financial instruments already governed by MiFID II. Hence, USDMI is exempt from MiCA.

4. The Market Size & Revenue Opportunity

4.1 Revenue Model

The issuer would take a portion of the interest earned on the US Treasuries held as collateral. For example, the issuer might take one percentage point of the interest earned (out of the currently prevailing ~5% US Treasury yield).[36] If the market becomes competitive, the issuer might charge only a 0.5% fee.

4.2 Revenue Potential

The revenue potential for varios market share assumptions are below. Note that for simplicity of calculations, we round the current $170 billion Stablecoin market up to $200 billion. It is reasonable to expect the stablecoins outstanding to reach $200 billion by the time USDMI is issued anyway, especially given that outstanding stablecoins already grew 30% in the 9 months preceding the writing of this report:

Revenue Opportunity by Market Share of Today's Stablecoin Market					
USDMI Market Share of Stablecoins	**0.5%**	**1%**	**2.5%**	**5%**	**10%**
USDMI Outstanding	$1b	$2b	$5b	$10b	$20b
Implied Revenue Today (1% Fee)	$10m	$20m	$50m	$100m	$200m
Implied Revenue Today (0.5% Fee)	$5m	$10m	$25m	$50m	$100m

Figure 4.1

Since the stablecoin market is projected to grow to $2.8 trillion by 2028, we also examine the results by a larger future market size (we round the market size up to $3 trillion for simplicity):

Revenue Opportunity by Market Share of Projected 2028 Stablecoin Market					
USDMI Market Share of Stablecoins	**0.5%**	**1%**	**2.5%**	**5%**	**10%**
USDMI Outstanding	$15b	$30b	$75b	$150b	$300b
Implied Revenue (1% Fee)	$150m	$300m	$750m	$1.5b	$3b
Implied Revenue (0.5% Fee)	$75m	$150m	$375m	$750m	$1.5b

Figure 4.2

If we conservatively assume only 0.5% penetration of the stablecoin market, it would imply almost ~$5m in revenue today growing to $75m in revenue in the next 5 years. As demand grows for USDMI, the revenue could scale dramatically - sufficient to capitalize a sovereign wealth fund.

[36] https://home.treasury.gov/resource-center/data-chart-center/interest-rates/TextView?type=daily_treasury_bill_rates&field_tdr_date_value=2024 (Accessed October, 2024)

5. The RMI's Positioning

5.1 Competitive Analysis vs. Other Countries

Any sovereign state could issue such a Digital Brady Bond, and we expect many to do so. However, based on the history of stablecoins, the first mover will have a unique advantage.

	First-Mover (Tether USDT)	Second-Mover (Circle USDC)	All Others
Market Share	72%	20%	8%

Figure 5.1

The RMI is well-positioned to be dominant. Many small jurisdictions that serve as major corporate hubs are not actually sovereign and thus could not issue sovereign debt. For example, the Cayman Islands, BVI, Bermuda, Gibraltar, Isle of Man, and Jersey are all British Territories. Several common offshore jurisdictions for the US that are UN Member States are listed in the following figure:

Country	Currency	Legal System	Listed Companies (NYSE/NASDAQ)
Marshall Islands	USD	Common	35
Greece	EUR	Civil	25
Switzerland	CHE	Civil	17
UAE	AED	Civil + Sharia	8
Bahamas	BSD	Common	3
Micronesia	USD	Common	0
Palau	USD	Common	0
Solomon Islands	SBD	Common	0
See Appendix E for a more comprehensive table.			

Figure 5.2

Out of all UN Member States, the RMI, Palau, and Solomon Islands are the only nations with the US Dollar as the primary currency and a legal system based on US law (common law). While we are not aware of any initiatives in the Solomon Islands, Palau has recently announced a live blockchain-based savings bond prototype, which is awaiting approval by the Ministry of Finance and the Palau government before entering production. At that point, "any Palau citizen will be able to buy them from the comfort of their phone via a mobile app."[37]

All else being equal, the RMI will have an advantage because of its long track record of legal maturity that is sufficient to host multiple publicly listed companies. The RMI domiciles 35 listed companies on the New York Stock Exchange (NYSE) or NASDAQ, while Greece has only 25, Switzerland has only 17, UAE has only 8, Cyprus 5, Bahamas 3, Palau zero, and the Solomon Islands zero. However, given that the first-mover has had a strong advantage in new crypto projects in the past, speed to market is a significant factor in the project's outcome.

[37] https://www.globalgovernmentfintech.com/palau-blockchain-savings-bond-prototype/ (Accessed October, 2024)

6. The Proposed Regulatory Framework

It is in the public interest to ensure that a Digital Brady Bond is properly regulated. It must adhere to the AML/CFT standards set by FATF and ensure it incorporates best practices to prevent illicit activity. Rather than design a new regulatory framework from scratch, we recommend the RMI apply the same regulatory framework used today by the US to regulate domestic Money Services Businesses. That is the regulatory framework that applies to USDC, the largest US-regulated stablecoin ($35 billion outstanding).

6.1 Regulator & Oversight Board

Day-to-day regulation of USDMI would fall under the purview of the banking commissioner's office or a newly established Monetary Authority. In addition, we recommend the RMI establish a strategic oversight board of elected officials to monitor and provide input on the progress of the project.

6.2 Adopting The US Money Services Business (MSB) Regulatory Framework

The largest US-based stablecoin issuer, Circle (USDC), with $34 billion outstanding, is regulated as a Money Services Business. We see no reason that USDMI shouldn't adhere to the same regulatory framework. As such, we recommend that the RMI adopt and apply the MSB regulatory framework, making adaptations where common sense dictates.

The United States regulated MSBs through the Financial Crimes Enforcement Network (FinCEN), a bureau of the US Department of the Treasury. Key federal obligations include:

- Registration: All MSBs must register with FinCEN.
- Anti-Money Laundering (AML) Program: MSBs must implement and maintain a comprehensive AML program, which includes but is not limited to (a) Written policies and procedures to detect and prevent money laundering and terrorist financing, (b) appointing a compliance officer, (c) Regular employee training, (d) Independent audits, (e) filing of Suspicious Activity Reports (SARs) for transactions that appear to be suspicious, (f) maintaining records of certain transactions, particularly those involving large sums of money or international money transfers.

6.3 Adopting The Stablecoin Standard Framework

We also recommend that the RMI also go above and beyond the requirements of an MSB. The Stablecoin Standard is an international self-regulatory association that publishes best practices on stablecoin regulation and compliance, advised by top international law firms. These standards add common sense regulations that may not be included in the MSB framework, which was written before stablecoins were invented. See Appendix C for the complete framework.

6.4 Primary Purchase Requirements

Under the MSB laws, Issuers must establish a risk-based Customer Identification Program (CIP), known as a Know Your Customer (KYC) program. Generally, KYC should be done with increasing rigor as direct counterparties purchase in larger quantities. For those who purchase under $10,000, risk-based screening of wallets and transaction patterns may be sufficient without full KYC.

6.5 Secondary Purchase Requirements

Stablecoins regulated as MSBs do not need to perform KYC for secondary transfer recipients. Rather, that is the responsibility of the sender and receiver of each transaction. Different jurisdictions around the world impose their own requirements on senders and receivers. For example, many businesses are required to KYC counterparties they pay over a certain threshold, while individuals sending small amounts have fewer requirements.

6.6 Secondary Market Monitoring

Stablecoins regulated as MSBs are responsible for monitoring secondary transfer activity observed on the blockchain. This process can be facilitated by software providers like Chainalysis, Ciphertrace, and TRM Labs. See Appendix B (Compliance Program) for a detailed description of the proposed monitoring program. Issuers must report particularly suspicious transactions to their regulator. Monitoring includes blacklisting certain known wallets associated with bad actors (e.g. OFAC maintains a list of blacklisted wallets). Attempted transactions to blacklisted wallets will automatically fail, helping prevent the illicit use of the stablecoin.

Secondary market monitoring can be quite effective. For example, in February of 2023, a Norwegian police agency Okokrim announced the seizure of $6 million in cryptocurrency that they had traced through blockchain data to a North Korean hacking group. The agency pounced when the hackers tried to withdraw into the physical world. The State's Attorney, Marianne Bender, wrote, "This case shows that we also have a great capacity to follow the money on the blockchain, even if the criminals use advanced methods."[38]

6.7 Tools for Law Enforcement

Stablecoin Issuers regulated as MSBs must be responsive to law enforcement inquiries. In particular, law enforcement can request that issuers freeze USDMI held by certain wallets so they can't be transferred or redeemed. Issuers can also freeze at their own discretion if illicit activity is identified. For example, in September of 2024, four stablecoin issuers, including both Tether and Circle, announced they had frozen and seized over $5 million in stablecoins in two wallet addresses that monitoring of secondary market transaction data indicated were tied to the same infamous state-sponsored North Korean hacking group, Lazarus.[39]

6.8 Compliance Bottom Line

We assess that the RMI can replicate the current, well-understood compliance regime of stablecoins in the US. This prevents illicit activity while enabling usage by everyday people around the world.

[38] https://www.okokrim.no/rekordhoegt-kryptobeslag-i-axie-saka.6585492-549344.html (Accessed October, 2024)
[39] https://www.theblock.co/post/316523/stablecoin-issuers-freeze-5-million-worth-of-stablecoins-tied-to-lazarus-group-by-zachxbt (Accessed October, 2024)

7. Risks

All new initiatives have risks. We focus herein only on the most important and frequently cited. We break these risks down into three types: (1) Risks that the project fails commercially, (2) Risks that would impact the broader RMI economy, and (3) Risks that the RMI would lose money. For each, we grade the probability of the risk occurring. Notably, we then consider mitigants before calculating a severity score so that the risk assessment includes mitigants. We then grade the severity of the risk based on the impact. Finally, we apply a risk matrix to each risk and provide an overall risk analysis of the project.

7.1 Risk Framework

We judge risks by severity and by probability of occurrence.

Severity Level	Impact on RMI	Probability Level	Probability
5	Severe Impact	5	Very High
4	Significant Impact	4	High
3	Moderate Impact	3	Moderate
2	Minor Impact	2	Low
1	Minimal Impact	1	Very Low

Figure 7.1

By combining the severity and probability rating, we establish a risk matrix.

Risk Scoring Matrix		Severity of Impact				
		1. Minimal	**2. Minor**	**3. Moderate**	**4. Significant**	**5. Severe**
Probability of Occurrence	**5. Very High**	Moderate (5)	High (10)	Extreme (15)	Extreme (20)	Extreme (25)
	4. High	Moderate (4)	Moderate (8)	High (12)	Extreme (16)	Extreme (20)
	3. Moderate	Low (3)	Moderate (6)	Moderate (9)	High (12)	Extreme (15)
	2. Low	Low (2)	Low (4)	Moderate (6)	Moderate (8)	High (10)
	1. Very Low	Low (1)	Low (2)	Low (3)	Low (4)	Moderate (5)

Figure 7.2

We categorize each risk into this matrix.

7.2 Risks The Project Will Not Succeed

Commercial failure of the project, while unfortunate, should not have a material impact on the RMI. The RMI has the ability to dissolve USDMI and return funds to bondholders at its discretion. Doing so would incur no financial loss to the RMI, besides the time and attention of initiating and overseeing the project. Presuming, of course, the operational expenses are financed externally by third parties.

Demand may not materialize.

Severity = 1 | Probability = 4 | Risk Score = Low (4)

People like using what they are used to. People may not care enough about earning extra yield to switch from existing, well-known stablecoins. Many people around the world already use Tether and other stablecoins as a dollar-denominated savings account. For them, the benefit of avoiding inflation in their local currency may be so valuable that an extra 5% is trivial - not worth the effort to switch. As interest rates start to decrease, the attractiveness of the extra yield may diminish further.

USDMI may lose its competitive advantage if other countries issue competing products.

Severity = 1 | Probability = 3 | Risk Score = Low (3)

USDMI has an advantage because sovereign bonds are granted regulatory privileges around the world. If another sovereign were to issue a competing product, the RMI would be forced to compete, losing at least some market share.

USDMI could be rendered superfluous if the US Digitizes its own Treasuries on the blockchain.

Severity = 1 | Probability = 1 | Risk Score = Low (1)

USDMI will pay interest at a slight discount to US Treasuries, and have a slightly higher risk than US Treasuries themselves. If the US were ever to issue its own digital sovereign bonds, people would almost certainly migrate away from USDMI, resulting in the commercial failure of the project. The US has not indicated any interest in doing so at this time, and we expect it won't happen for many years.

USDMI may not be sufficiently differentiated from existing tokenized treasuries.

Severity = 1 | Probability = 3 | Risk Score = Low (3)

Already, tokenized treasuries are available from private issuers and have achieved some traction. Advantages like free transferability within the US may not be sufficiently differentiated from existing offerings, resulting in lackluster commercial success.

USDMI could face regulatory headwinds.

Severity = 1 | Probability = 5 | Risk Score = Low (5)

New laws and regulations related to stablecoins are being considered around the world. It is possible that they may remove or lessen USDMI's privileges, resulting in less commercial success. Furthermore, regulators in various jurisdictions may push back on USDMI for unanticipated political reasons.

The US may not approve a Schedule B Registration.

Severity = 1 | Probability = 4 | Risk Score = Moderate (4)

The ability to sell directly to everyday US persons is contingent on receiving approval for a Schedule B filing from the SEC. If the SEC rejects or indeterminately delays the filing, the RMI would have less advantages in the US. This would increase the risk of commercial failure.

Bad execution could result in the commercial failure of USDMI.

Severity = 1 | Probability = 3 | Risk Score = Low (3)

Management will need to promote, market, and administer the issuance. If management does a poor job, the project may not succeed.

Incorrect strategic decisions could result in the commercial failure of USDMI.

Severity = 1 | Probability = 3 | Risk Score = Low (3)

Even good management will need to make strategic decisions on where to focus in the face of uncertainty. Those decisions could turn out to be incorrect, which could negatively impact project success.

The US may put political pressure on the RMI to end the project.

Severity = 1 | Probability = 2 | Risk Score = Low (2)

Cryptocurrency is a political issue in the US. In addition, the US Treasury could decide that an interest-bearing stablecoin with the privileges of sovereign debt presents some risk. We judge this to be low probability because USDMI should result in more demand for US Treasuries, and the US likes more demand for US Treasuries.

7.3 Risks to The Broader RMI Economy

International institutions may increase the risk rating of the RMI.

Severity = 2 | Probability = 4 | Risk Score = Moderate (8)

Supranational institutions like the IMF publish regular reports on risks to the RMI's economy. These institutions could increase the country's risk profile in response to the issuance of USDMI. The probability is high because it has happened in response to most new RMI initiatives, such as the RMI's DAO LLC legislation.

FATF Blacklists the RMI due to failure to prevent illicit financing.

Severity = 4 | Probability = 1 | Risk Score = Moderate (4)

Various international institutions, such as the Financial Action Taskforce (FATF) and the EU, maintain blacklists of jurisdictions with weak measures to combat money laundering, tax evasion, and terrorist financing. For example, the RMI was previously on the EU blacklist as a result of the shipping registry.

This is high severity because FATF and EU blacklists can result in serious ramifications for the broader RMI economy. It can make moving in and out of the country harder and prevent many banks and businesses from engaging with the RMI and its companies.

We consider this low probability because private stablecoin issuers already operate in the US and many countries under established regulatory frameworks. USDMI is not doing anything materially differently, except that the issuer is sovereign. So long as the RMI implements a regulatory framework that matches those of other countries, illicit financing should be mitigated. Furthermore, there would be no reason for the FATF or the EU to single out the RMI.

USDMI pulls capital away from bank depository accounts, threatening local bank stability ("Deposit Flight") or driving the cost of capital higher.

Severity = 3 | Probability = 3 | Risk Score = Moderate (9)

Local Marshall Islands banks currently pay 1-2% on deposits. If USDMI pays 3-4% (calculated by subtracting a 1% government fee from the current 4.5%-5% rate on TBills), some people may move their savings from their bank account to USDMI. If many depositors did this at once, it could destabilize bank balance sheets. Further, this instability might drive away remaining correspondent banks. We analyzed this scenario from three perspectives:

First, is sudden deposit flight likely to happen?

- The reason to think deposit flight would happy quickly is that a rational actor with zero switching costs would do so.

- A reason to think deposit flight would not happen, or would happen slowly, are (a) that switching costs are more than zero. Put another way, 2% may not be enough to motivate a substantial portion of the population to adopt a new technology overnight.
- Another reason to think deposit flight would not happen is reluctance to keep large amounts of USDMI in a wallet on a phone that might be lost or compromised. Many people trust banks more than they trust themselves to hold large amounts of savings. If that were the case, people may hold a small amount themselves and a much larger amount in a bank.
- Finally, we note that US Treasuries are widely available to US persons and, on a day-to-day basis, the US banking system is relatively stable.

Second, how might banks react? Banks can compete for deposits in two ways:

- Raising rates: This would either (a) reduce bank profitability, (b) force banks to operate more efficiently, or (c) cause banks to increase the rate charged on business loans such that the bank's interest rate spread is preserved. Based on the Bank of Marshall Islands' public financial data, preserving their interest rate spread with no other changes might require raising nominal rates on loans from ~15% to ~18% to preserve their spread but make no improvements in efficiency. Of course, new loans would become new deposits, which would also earn the higher rates on deposits, thereby subsidizing the new loan and reducing the interest rate increase in real-terms.
- Providing new services: Banks could, for example, distribute and redeem USDMI as a deposit asset, since typically banks can hold securities issued by their sovereign on balance sheet.

Third, does the RMI have any mitigants? The RMI could decide to pursue a phased rollout of USDMI. For example, the RMI could impose a temporary cap on individual purchases and balances (e.g. $2,000 per person) while the impact of USDMI becomes clear.

We assess that deposit flight is likely to some degree, but not quickly. Over time, USDMI will likely put competitive pressure on banks to improve interest rates on deposits and services, which is good for consumers. But banks will have time to adjust gradually. Moreover, they may have good reasons to integrate USDMI into their banking services for both deposits and lending. Finally, there are also potential positive factors for deposits. For example, less expensive remittances could increase overall capital in the domestic economy and result in a net increase in deposits. Most importantly, the government should have time to evaluate, consider and respond. If unexpected shifts happen, there are immediate measures that can be imposed, making any risk manageable. As a result, the magnitude of the impact is neither high nor low, but rather moderate.

First Hawaiian may end its correspondent banking relationship with the RMI, leaving the RMI disconnected from the international financial system.

Severity = 3 | Probability = 2 | Risk Score = Moderate (6)

The RMI has only one correspondent banking corridor directly to the US, First Hawaiian Bank. If First Hawaiian were to consider USDMI to increase the compliance risks to the RMI, it could end its correspondent banking relationship. That would make it difficult for the RMI to access the global financial system, causing widespread damage to the economy. We consider this unlikely because the US Dollars used in purchases and redemptions of USDMI internationally can happen entirely within the US, such that money doesn't need to flow through First Hawaiian. Furthermore, the US has a strategic interest in the RMI, and the RMI expects to file a registration statement with US regulators. The US would likely encourage First Hawaiian to maintain its correspondent relationship.

7.4 Risks That The RMI May Lose Money

A cybersecurity event (e.g. a hack) may compromise the USDMI signing key or code.

Severity = 4 | Probability = 2 | Risk Score = Moderate (8)

USDMI can be created, destroyed, and administered using a unique, cryptographic 'Signing Key'. If hackers were able to access this signing key, they could create unbacked "USDMI" for themselves and sell it into the market, absconding with the proceeds.

This is medium severity because the RMI can delineate a predefined process for resolving claims in the event of a hack. In particular, this process will likely include freezing and seizing the fraudulent USDMI, which can easily be traced on the blockchain. Alternatively, if the signing key were unrecoverable, management could create an entirely new version of USDMI and distribute it to all current holders of the old USDMI, excluding the fraudulent units. The old version of USDMI would be ineligible for redemptions, making it superfluous.

A compromised signing key is low probability because there are effective, well-established best practices for safeguarding signing keys (e.g. Amazon runs a high-security service just for signing keys) that have proven extremely secure. For example, the top 5 stablecoins have over $170 billion units outstanding, and none have ever been compromised. Exploited smart contract code is low probability because the code is relatively simple, management will likely re-use smart contracts battle-tested by existing stablecoin or tokenized treasury issuers, and any changes would be reviewed by multiple independent security auditing agencies, with their reports published.

A cybersecurity event (e.g. a hack) may compromise the blockchain.

Severity = 2 | Probability = 3 | Risk Score = Moderate (6)

USDMI will be issued on blockchains like Solana ($73 billion market cap) and Ethereum ($315 billion market cap). If those blockchains, or any on which USDMI is issued, were to be hacked, it would compromise every asset on that chain, including USDMI.

This is medium severity because a predefined process can be implemented to resolve claims. For example, the RMI could reissue a new version of tokens to the holding wallets immediately before the hack. The old version of USDMI would be ineligible for redemptions, making it superfluous.

This is low likelihood because these chains already maintain billions of dollars in value, representing an attractive 'honeypot' to hackers. Yet, they have not been hacked to date.

Funds are embezzled

Severity = 5 | Probability = 1 | Risk Score = Medium (5)

If funds were embezzled, the RMI would have to provide financing to make USDMI holders whole. This is low probability because (a) the treasuries would be held by a US-regulated qualified custodian, and (b) the regulatory framework requires separation of responsibilities, so multiple people are required to effectuate any transactions.

Holders may redeem en masse while the value of the collateral has fallen.

Severity = 3 | Probability = 3 | Risk Score = Moderate (9)

USDMI will be fully collateralized by short-dated US Treasuries (TBills). So long as the TBills have time to mature, they will always return enough US Dollars to meet 100% of outstanding redemptions. However, bondholders could demand redemption sooner. In response, the RMI would sell off some TBills at the secondary market price. This price can fluctuate up and down. If they have fallen, it could result in a loss. Since the RMI has guaranteed the bond with its full faith and credit, the government would be on the hook for the loss to avoid triggering an event of sovereign default.

For context, the largest monthly interest rate change in the last 30 years implied a 0.3% drop in the resale price of a brand new 3-month TBill, so the magnitude is not large. Regardless, Appendix D provides a study of interest rate changes over the last 30 years to estimate the probability and magnitude of potential loss. It assumes the entire portfolio is in 3-month TBills purchased on the day before a price change.

The study concludes that there is only a 0.25% probability of prices dropping more than 0.14%, which would be only two months of revenue from the RMI's interest rate spread. So, even in such a loss, the RMI would still be turning a profit.

In practice, this loss can be mitigated in several ways:

- Hold a portfolio of TBills, some shorter and some longer duration.
- Use revenue to create an insurance fund.
- When interest rates drop, driving TBill prices higher, the RMI can sell off excess TBills at a profit and use the gains to create an insurance fund.
- Hedge out the interest rate risk by purchasing interest rate derivatives that pay out if interest rates rise.

Finally, USDMI is structured such that the RMI can delay redemptions at its sole discretion until its TBills mature, which entirely removes the risk of loss. However, this would not be a good customer experience for bondholders, so it would likely hurt the commercial success of USDMI. As a result, there is still some risk in this scenario.

7.5 Risk Analysis

Different risks demand different responses. We recommend the following response based on risk level.

Risk Analysis		
Risk Level	**Risks**	**Response**
Extreme	0	Consider not pursuing the project.
High	0	Consider changing the project strategy.
Moderate	8	Monitor mitigation efforts.
Low	8	No further need to address the risk.

Figure 7.3

In our assessment, there are no Extreme risks and likely no High risks. However, we recommend an oversight board appointed by the RMI cabinet reassess the risk analysis regularly to ensure the RMI responds appropriately to any emerging risks.

8. Cost Benefit Analysis

Financial access is an incredibly important driver of poverty alleviation and GDP growth. Already, stablecoins are held in 125 million unique wallets owned by people around the world.[40] Bringing a savings product to RMI citizens and billions of people around the world would provide important, incalculable benefits.

In addition, the upside for the government is substantial. The largest stablecoin issuer, Tether (USDT), reported an annualized net profit of $10 billion across the first half of 2024. In terms of revenue per employee - with a headcount of just 160 - it is currently one of the most profitable companies in the world. If USDMI were to launch and capture only 0.5% of the market share, the revenue opportunity would be $4 million, growing to $70 million by 2028. Capturing 2.5% of the market share would be worth $21 million in revenue, increasing to $350 million in 2028. Capturing 10% of market share would be worth $85 million in revenue, growing to $1.4 billion in 2028. Again, Section 4: Market Size & Revenue Opportunity contains a full analysis.

This is a significant revenue opportunity that, after being assessed through a comprehensive risk framework, carries only a moderate level of risk, including a low risk of financial loss accompanied by clear mitigation opportunities and procedures to protect the broader economy. In particular, the RMI can implement the same regulatory framework currently used by the US and actively monitor the results of these efforts. If they do, the risks should be straightforward to mitigate.

In totality, analysis indicates that the benefits outweigh the costs.

9. Conclusion

It is relatively rare to identify opportunities with potential benefits to billions of people and upside of this magnitude paired with well-understood, classifiable, and manageable risks. They are rare, in part, because they are quickly seized upon. In this instance, a first-mover advantage is still available and ideally suited to be capitalized on by a small, nimble, and responsible sovereign.

[40] https://app.rwa.xyz/stablecoins (Accessed October, 2024)

10. Advisors

This report has been prepared with input from a variety of experts.

Mark Lurie

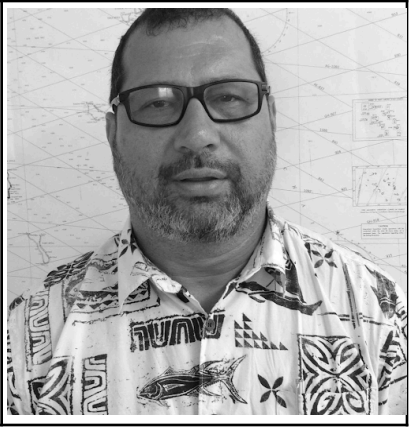
- Director of stablecoin issuer GMO-Z.
- Director of MIDAO
- Fmr CEO of cryptocurrency exchange (exited 2024)
- Fmr Founder/CEO of two other venture-backed startup exits
- Fmr Investor at Bessemer Venture Partners, FJLabs
- Harvard Business School MBA
- Harvard College BA

Adam Miller

- CEO of MIDAO
- Worked at Capital Group (top 5 largest global asset manager).
- Massachusetts Institute of Technology (MIT), BS

Bobby Muller

- Former Chief Secretary of the Government of the RMI
- President of MIDAO
- Project Manager, Pacific International Inc (largest private employer in RMI)
- Private sector representative on the RMI US Trust Fund committee.
- Loyola Marymount University, BA



Dr. Peter Dittus

- Former Secretary General of the Bank for International Settlements (BIS) 2005-2016
- Fmr BIS Deputy Secretary General, CIO, Principal Economist 1992 - 2005
- Fmr Economist, World Bank
- Fmr Economist, OECD
- Saarland University, PhD Economics
- University of Michigan, BA

The issuer's counsel is Cleary Gottlieb, who advises on the legal structure and regulatory treatment.

Cleary Gottlieb (Firm)

Top 50 global law firm and past advisor on sovereign debt issuances including Argentina, Brazil, Chile, Dominican Republic, Mexico, Uruguay, and more (https://www.clearygottlieb.com/)

Juan Giráldez

Focuses on international financing, business transactions, capital markets, mergers & acquisitions, and cross-border financings, especially in Latin America.

- Partner, with Cleary Gottlieb since 1998.
- Recognized in Chambers Global, Latinvex, IFLR1000, and The Legal 500.
- Advised sovereign bond issuances of Uruguay, Argentina, and the Dominican Republic, among others.
- Focuses on international financing, business transactions, capital markets, mergers & acquisitions, and cross-border financings, especially in Latin America.

Brandon Hammer

Focuses on digital assets, creditors' rights, netting, financial regulation, bankruptcy, digital assets, and market infrastructure.

- Partner, Cleary Gottlieb since 2014.
- Represents clients before federal regulatory agencies like the CFTC and SEC.
- Represents financial institutions, clearinghouses, sovereigns, and end users, including leading trade associations and industry coalitions. Specialization in advising on close-out netting rights under various US insolvency regimes, such

as the Bankruptcy Code. Extensive experience with digital asset custodians, ensuring bankruptcy remoteness of custodied assets.
- Has served as counsel for Gemini, Paxos, and Goldman Sachs, especially for digital assets and cryptocurrency.
- JD Harvard Law School, BA Columbia University.

David Lopez

Focuses on corporate governance, public reporting, capital markets, finance, liability management, and digital assets.

- Partner, with Cleary Gottlieb since 1989.
- Co-leads Cleary's digital assets and distributed ledger practice, advising payment companies, exchanges, and custodians.
- Counsel to issuers including Alcoa, McDonald's, Citigroup, and Petrobras.
- Counsel to underwriters including American Express and BlackRock.
- Specialization in structuring and compliance for digital asset projects, including lending, staking, stablecoins, and tokenized real-world assets.
- JD University of Chicago, BA Cornell University.

Ignacio Lagos

Specialist in cross-border corporate and financial matters, with a focus on Latin American sovereigns and state-owned enterprises.

- Associate, with Cleary Gottlieb since 2014
- Helped advise $63.4 billion sovereign debt restructuring of Argentina, $17.4 billion debt restructuring of Ecuador, $7.1 billion debt restructuring of the Province of Buenos Aires.
- Advised Uruguay on its inaugural sustainability-linked bond offering.
- LLM Stanford University, BA University of Buenos Aires.

Inca Digital advised on the compliance program.

Inca Digital (Firm)

Inca Digital is an intelligence company that provides data, AI-driven analytics, and expertise to many of the world's leading exchanges, financial institutions, regulators, and government agencies. Inca is used to surveil digital asset markets and ecosystems, manage risk for banks and fight illicit use of cryptocurrency. Clients include the US Federal Reserve, Dept of Homeland Security, SEC, CFTC, Paypal, DARPA, NY State, US Special Operations Command, and more (https://inca.digital/).

Adam Zarazinski

Expert in digital asset markets, blockchain data, and surveillance, helping combat crime.

- CEO, Inca Digital, since 2018.
- Judge Advocate, US Air Force Reserve.
- Officer, US Air Force 2014-2018, including Chief of Operations law for 320th Air Expeditionary Wing, Assistant Staff Judge Advocate, Deputy Chief of Military Justice, and deployment to Afghanistan.
- JD University of Michigan, MA University of Nottingham, BA DePaul University.

11. Further Reading

1. *African Forum and Network on Debt and Development (AFRODAD)*, https://afrodad.org/wp-content/uploads/2023/01/Resource-Backed-Loans-and-Public-Sector-Collateralisation-of-Natural-Resources-in-African-Countries.pdf
2. "Analytics on Tokenized Assets." *RWA.Xyz | Analytics on Tokenized Assets*, www.rwa.xyz
3. *Assessing Public Sector Borrowing Collateralized on Future Flow ... - IMF*, www.imf.org/external/np/fad/2003/061103.pdf
4. "Collateralized Transactions: Key Considerations for Public Lenders and Borrowers." *IMF*, 19 Feb. 2020, www.imf.org/en/Publications/Policy-Papers/Issues/2020/02/19/Collateralized-Transactions-Key-Considerations-for-Public-Lenders-and-Borrowers-49063
5. *Collateralized Transactions: Recent Developments and Policy ... - IMF*, www.imf.org/external/np/g20/pdf/2023/121423.pdf
6. *International Monetary Fund - IMF*, www.imf.org/~/media/Files/Countries/ResRep/ZWE/collaterized-debt-presentation-august-2019-final.ashx
7. "New Fintech Applications in Bond Markets." *New FinTech Applications in Bond Markets " ICMA*, www.icmagroup.org/market-practice-and-regulatory-policy/fintech-and-digitalisation/fintech-resources/new-fintech-applications-in-bond-markets

Appendix A: Legal Structure

This summary is based on the legal structure advised upon by Cleary Gottlieb (https://www.clearygottlieb.com/), a top-50 global law firm and past advisor on sovereign debt issuances in Argentina, Brazil, Chile, the Dominican Republic, Mexico, Uruguay, and more.

Overview of Structure

- The Republic would issue debt securities to be purchased by investors in exchange for a purchase price.
- Tokens transferrable through the blockchain would represent ownership of the debt securities.
    - The Republic (or an agent of the Republic) would maintain a register reflecting ownership of the debt securities.
    - The Republic would make clear through the issuance documents that the register will record as the owner of debt securities anyone who identifies that it has the token on the blockchain.
- The Republic uses the purchase price to purchase US Treasuries, expected on a rolling basis, and reinvests any funds received on distributions on such US Treasuries to purchase additional Treasuries. The Republic can buy 1-month US Treasuries to match gains with the interest rate payable under the securities or buy US Treasuries with other tenors.
    - The US Treasuries will be the property of the Republic, pledged to an entity acting as custodian (and, if required, collateral agent) (the "Custodian") for the benefit of holders of the debt securities.
    - If the value of the US Treasuries falls below the principal amount of the securities plus accrued interest thereunder, the Republic may purchase additional US Treasuries to cover the shortfall.
- The debt securities accrue interest at a floating rate equal to a specified US Treasury rate (e.g. 1-month Treasuries) minus a spread.
- Interest would be capitalized over time with additional debt securities delivered periodically by increasing a holder's amount in the register.
- Debt securities may have a maturity date or be perpetual
- Debt securities will be subject to redemption at the option of the Republic
- Holders will have the option to redeem their debt securities at any time or during pre-defined redemption windows (to be determined)
- Upon redemption of debt security at the option of the holder (potentially restricted to certain windows), the Republic will pay the principal amount and accrued interest as soon as practicable, but in no later than a predetermined number of calendar days.
- Holders will be required to identify themselves as the holder of the token to receive payment. They may do so by proving ownership of the address (signing) rather than KYC.
- As a practical matter, the Republic may fund any redemption by instructing the Custodian to sell a corresponding amount of US Treasuries, but it is not required to (i.e., it can pay from other sources)
- Ultimately, the obligation of the Republic to pay the principal amount and interest on the debt securities survives even if, for any reason, there are insufficient proceeds from the sale of US Treasuries.
- Redeemed debt securities will be canceled.
- The debt securities would constitute obligations of the Republic that benefit from the full faith and credit of the Republic.

Holders' rights vis-à-vis the Republic

- If the Republic fails to meet its obligations (including failure to meet redemption requests promptly), an Event of Default will occur under the terms of the indenture/fiscal agency agreement, and the Custodian will liquidate the investment portfolio to repay token holders, subject to token holders approval.
- The Republic will be liable for any shortfall in the liquidation of the portfolio.

- Debt securities may be amended.
    - If an amendment is adverse to holders, their consent would be required, subject to CACs majorities.
    - TBD how voting would be conducted (given no clearing system)

Issuing and Holding Procedures

- The Republic will issue and place debt securities to be purchased directly by investors (no underwriters)
- Ownership of debt securities will be recorded on the register
- Investors can hold the tokens representing ownership of the securities directly through the blockchain or via trust companies, banks, or limited-purpose broker-dealers ("Intermediaries")
    - Examples include Fidelity Digital Asset Services, LLC, Paxos Trust Company, Coinbase Custody Trust Company, Prometheum, and Ember Capital.
    - The Republic would agree to record on the register anyone who holds a token as the owner of the corresponding securities.

Transferability

- The debt securities will constitute uncertificated securities for purposes of the UCC.
    - As a result, they should generally be negotiable and security interests can be perfected by delivery on the blockchain.
- The debt securities will trade exclusively over the counter, not on any exchange.

AML/KYC/Sanctions Considerations

- The Republic will set up processes to run KYC on holders upon redemption (but not necessarily on issuance depending on risk-based thresholds) and ensure sanctions compliance for transactions with a US jurisdictional nexus.

Appendix B: Compliance Program

This summary is based on a compliance program advised by Inca Digital (https://inca.digital/), a leading provider of cryptocurrency compliance software solutions to the US government.

Direct Issuance and Redemption

1. **KYC (Know Your Customer) and AML (Anti-Money Laundering) Integration:**

   KYC Process: Ensure every holder over $10,000 has undergone a risk-based KYC verification process. This would include various methods up to collecting essential identification documents (passport, driver's license, proof of address) and verifying this information against trusted databases (e.g., global watchlists, sanction lists, PEP (Politically Exposed Persons) lists).

   Ongoing Monitoring: Post-issuance, the system will regularly check the KYC status of every holder over the threshold, ensuring that information is updated at required intervals. It should also conduct periodic re-verifications for high-risk holders (those with substantial holdings or from high-risk jurisdictions).

2. **Transaction Monitoring:**

   Transaction Monitoring: Forensics data will identify wallets interacting with illicit accounts, suspicious flow patterns, and more.

   Suspicious Patterns: The system would need to identify suspicious patterns such as:
   - Structuring/Smurfing: Breaking large transactions into smaller ones to avoid detection.
   - Frequent or Sudden Large Transactions: An individual suddenly transacting significantly larger amounts than they have in the past could be flagged for further investigation.
   - Cross-Border Transactions: Transactions involving jurisdictions (where identifiable) known for lax tax enforcement or historically linked to tax evasion (e.g., Cayman Islands, Switzerland) would receive special scrutiny.
   - Related Party Transactions: If an entity appears to be transacting frequently with related parties or linked accounts, this could be indicative of attempts to obfuscate asset ownership.

   Flagging and Escalation: Transactions that meet certain pre-defined criteria will automatically be flagged for review by compliance officers. This system would also trigger alerts for manual review if needed.

Secondary Market Transactions

Illicit activity can be detected, enforced, and deterred in secondary transactions by combining transaction monitoring with third-party wallet identification. Specifically, transaction monitoring can flag addresses exhibiting suspicious behavior. The transfers can be traced forward/back until they inevitably off/onramp to/from the banking system. This has to happen through a centralized exchange or a dedicated on/offramp like Moonpay, both of which are regulated financial intermediaries that KYC all users. MIBOND can report these wallets to authorities like FinCEN. FinCEN may then issue subpoenas, as necessary, to obtain the underlying customer data from the on/offramp provider.

1. **Transaction Monitoring:**

   Transaction Monitoring: Forensics data will identify wallets interacting with illicit accounts, suspicious flow patterns, and more.

   Suspicious Patterns: The system would need to identify suspicious patterns such as:
   - Structuring/Smurfing: Breaking large transactions into smaller ones to avoid detection.
   - Frequent or Sudden Large Transactions: An individual suddenly transacting significantly larger amounts than they have in the past could be flagged for further investigation.
   - Cross-Border Transactions: Transactions involving jurisdictions (where identifiable) known for lax tax enforcement or historically linked to tax evasion (e.g., Cayman Islands, Switzerland) would receive special scrutiny.
   - Related Party Transactions: If an entity appears to be transacting frequently with related parties or linked accounts, this could be indicative of attempts to obfuscate asset ownership.
   - AI & Machine Learning: These models could detect subtle changes in user patterns that might signal an attempt at tax evasion, such as moving funds slowly over time or switching jurisdictions before cashing out. They could detect outliers in transactional data, such as unusually large or frequent transactions, as compared to historical trends. Furthermore, models can predict the likelihood of a holder engaging in tax evasion based on previous behavior, jurisdiction of residence, and transaction patterns. These models would continually improve as more data is added to the system. The system could learn from cases where human compliance officers intervene. If a flagged transaction is deemed compliant after human review, this feedback is fed into the model to reduce false positives.

   Flagging and Escalation: Transactions that meet certain pre-defined criteria will automatically be flagged for review by compliance officers. This system would also trigger alerts for manual review if needed.

   Interaction With Centralized Exchanges: Identification and flagging of wallet addresses that interact with centralized exchanges and report findings to the IRS for further action.

2. **OSINT Threat Intelligence:**
   Often, people will publish information about their activities in one place and publish their wallet or ENS elsewhere. If they do, they can be linked.

   Social Media Behavioral Patterns: By analyzing social media platforms like Twitter, Telegram, and Reddit, we can identify users who may inadvertently disclose their financial activities and their relationship to the United States. For example, a user might boast about significant crypto gains or tax evasion strategies using the product.

   Dark Web Marketplaces and Forums: Monitor dark web platforms for discussions or transactions related to MIBOND products and services, particularly where users are seeking to exchange stablecoins for fiat currency through illicit channels. These forums often serve as marketplaces for services that facilitate tax evasion, money laundering, or the anonymization of large transactions and can be key sources for identifying users attempting to evade taxes using the stablecoin.

   Offshore Company Mentions: Users discussing the creation of offshore shell companies or trusts to hold stablecoins may indicate tax avoidance schemes. By tracking keywords like "offshore bank," "tax haven," "Cayman trust," or "non-resident status," we can flag individuals potentially using the stablecoin to hide their assets.

Quarterly Reporting:

Quarterly Report: Each quarterly report will include a breakdown of flagged transactions that meet predefined risk criteria, such as unusual transaction patterns. The report will contain anonymized holder identifiers, such as wallet addresses and transaction details that align with law enforcement standards for further review.

Direct Support for IRS Investigations: Upon request, Inca Digital will assist the IRS in any investigations that stem from the reports. This could include providing additional transaction data, OSINT intelligence, or insights into the behavior patterns of the flagged users. Inca Digital's technical expertise will help the IRS trace asset movements and identify potential hidden funds.

Assistance with Asset Freezing: MIBOND will develop a process for the IRS to request that funds associated with a specific address be frozen conditional on KYC to ensure that the user complies with legal and regulatory frameworks.

Appendix C: Regulatory Framework - The Stablecoin Standard

This framework is published by The Stablecoin Standard, an international self-regulatory association that publishes best practices on stablecoin regulation and compliance, advised by top international law firms. The framework is copied below and available at https://www.stablecoinstandard.com/policy/standards. We recommend implementing the Stablecoin Standard framework In addition to adhering to the compliance standards of a US Money Services Business.

The Definition

For these Standards, which apply to projects promoting their tokens as stablecoins, the SCS defines a stablecoin as follows:

> A fiat-backed token issued on a blockchain and prudentially regulated with a primary regulator, when available, and in any required additional jurisdictions. The stablecoin must maintain reserves at a 1:1 ratio to all outstanding tokens, comprised exclusively of high-quality liquid assets (HQLA), and also adhere to the other requirements specified in these Standards.

1. Operational Resilience: Financial Viability and Stability

Issuers make the following operational commitments:

- Maintain fully collateralized treasury reserves of high-quality liquid assets with minimal market, credit, and concentration risks.
- Reserve assets should be stress-tested and, when possible, overcollateralized to ensure they fully cover the total peg value, even under extreme conditions.
- Avoid unnecessary risk-taking with the reserves backing the stablecoin. Reserve assets must be valued daily on a marked-to-market basis and must cover at least 100% of the par value of all outstanding stablecoins, including those held by the issuer.
- For reserves that are considered direct bank risk, credit insurance is required when needed.
- Legally separate and title reserves for the benefit of stablecoin holders.
- Ensure reserves are held by credible financial institutions, and where possible, diversified among institutions.
- Restrict the re-hypothecation of reserve assets and manage reserves to provide ready liquidity.
- Design products to support timely redemption in fiat without unreasonable redemption costs.
- Commit to at least monthly disclosures of reserve assets, which must be verified by an accounting firm, and annual financial audits of reserves by a registered accounting firm.
- Establish a resiliency and insolvency management program, including design features intended to be bankruptcy remote.
- Manage adequate policies and controls to manage investment activities and ensure liquidity for redemptions.
- Liquidity risk management practices and periodic stress testing are required.

2. Transparency & Business Conduct

Issuers commit to prioritizing consumer protection through the following actions:

- Adopt a transparent governance and risk management approach that delivers clear roles and responsibilities and independent board oversight for governance and compliance attributes contained within these Standards.
- Publish reports at least monthly on the total amount of the stablecoins in circulation, the mark-to-market value of reserve assets, and the composition of reserve assets. Attestation to the issuer's reserves must be published on the issuer's website or similar public forum.
- Provide clear and conspicuous product and risk disclosures in a white paper or similar public document that covers at a minimum pricing, costs, and fee policies as well as the redemption policy, stabilization mechanism, and reserves management.

- Maintain complaint handling standards to promote prompt resolution of issues and errors including transparency of such on a user website or platform.
- Uphold a standard of business ethics and personal privacy rights of users. Maintain a code of conduct.
- Ensure a professional team qualified with expertise and good character.

3. Issuer/Product Commitments

Issuers commit to financial crime prevention through the following actions as required and in adherence with fair business practices as applicable:

- Maintain a program with qualified and adequate resources to address issues related to fraud, theft, market manipulation, and inappropriate trading.
- Maintain cybersecurity and information security, data privacy, and marketing programs.
- Maintain AML, sanctions, and CTF programs, including customer due diligence and reporting suspicious activities.
- Implement a risk management program and satisfy requirements for regulatory permissions, including timely reporting/filings and a regulatory strategy for compliance with applicable laws, rules, and regulations.
- Conduct and document technology, including protocol-level asset, due diligence.

Appendix D: Risk Study of Potential Losses to RMI

USDMI will be fully collateralized by short-dated US Treasuries (TBills). So long as the TBills have time to mature, the assets will return enough cash to meet 100% of outstanding redemptions. However, bondholders could demand redemption sooner. In response, the RMI would sell off some TBills at the secondary market price. This price can fluctuate up and down. If they have fallen, it could result in a loss. Since the RMI is backing the bond with its full faith and credit, the government would be on the hook or trigger an event of sovereign default.

In practice, the legal structure of USDMI reserves the right of the RMI to delay redemptions until the underlying TBills mature, which entirely mitigates this risk. Still, it is worth estimating the magnitude of this risk.

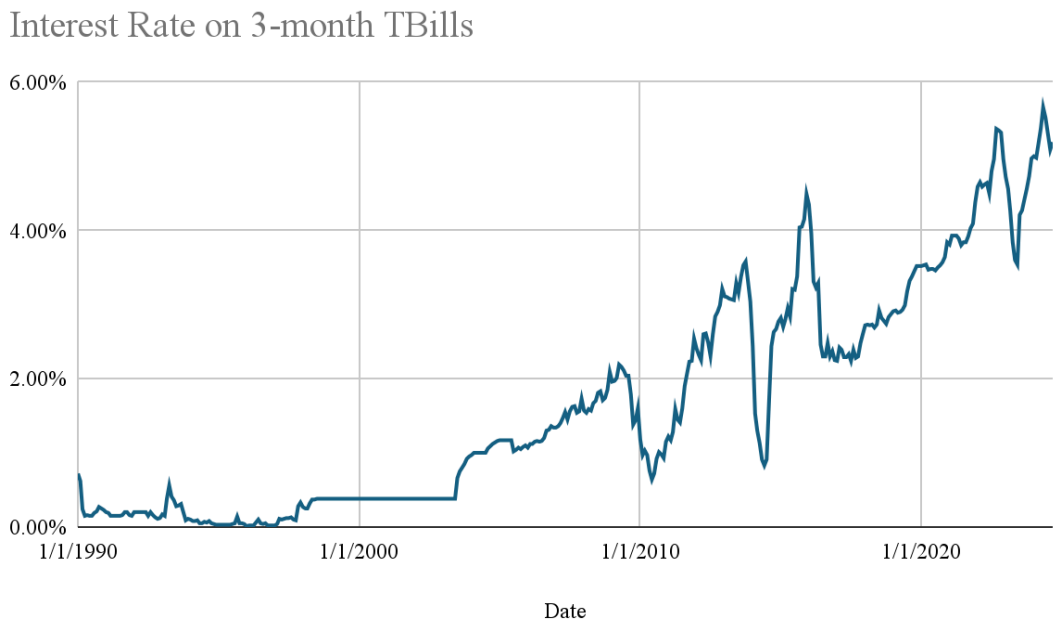
To evaluate the likelihood and severity of such a loss, we look at interest rates over the last 30 years and the corresponding change in the price of 3-month TBills that had been purchased immediately prior. The relationship between TBill price and interest rates (market yield) is:

$$\text{Price Change} = -\text{Duration} \times \Delta\text{Yield}$$

Where Duration is the weighted average time of the bond cash flows. In the case of a 3-month TBill, the duration is 0.25 years (because a 3-month TBill does not have coupons, just a bullet payment at the end).

Note that in practice, the collateral will include a range of maturities. For example, it will include a buffer of cash to satisfy day-to-day redemptions along with a set of TBills maturing at different terms (e.g. some maturing in two weeks, some in four weeks, and so on and so forth) that are each rolled over at maturity. As a result, the average duration will be much shorter than three months, and thus, the price sensitivity and potential loss are much less than estimated herein. Regardless, for simplicity, we consider only the worst-case scenario where 100% of the collateral is in 3-month TBills purchased one day prior to a change in rates.

Interest rates over the past 30 years have moved as follows:[41]



[41] Data provided by https://fred.stlouisfed.org/ (Accessed October, 2024)

Figure A

The average monthly price change implied by these changes in interest rates is 0.0017%, with a standard deviation of 0.0476%. This implies that in any given month, there is a 68% probability of a gain or loss less than 0.0476% (a one standard deviation move), a 95% probability of a gain/loss less than 0.10% price change (a two standard deviation move) and a 99.5% probability of a gain/loss less than 0.14% (a three standard deviation move). A histogram of all monthly price changes is as follows:

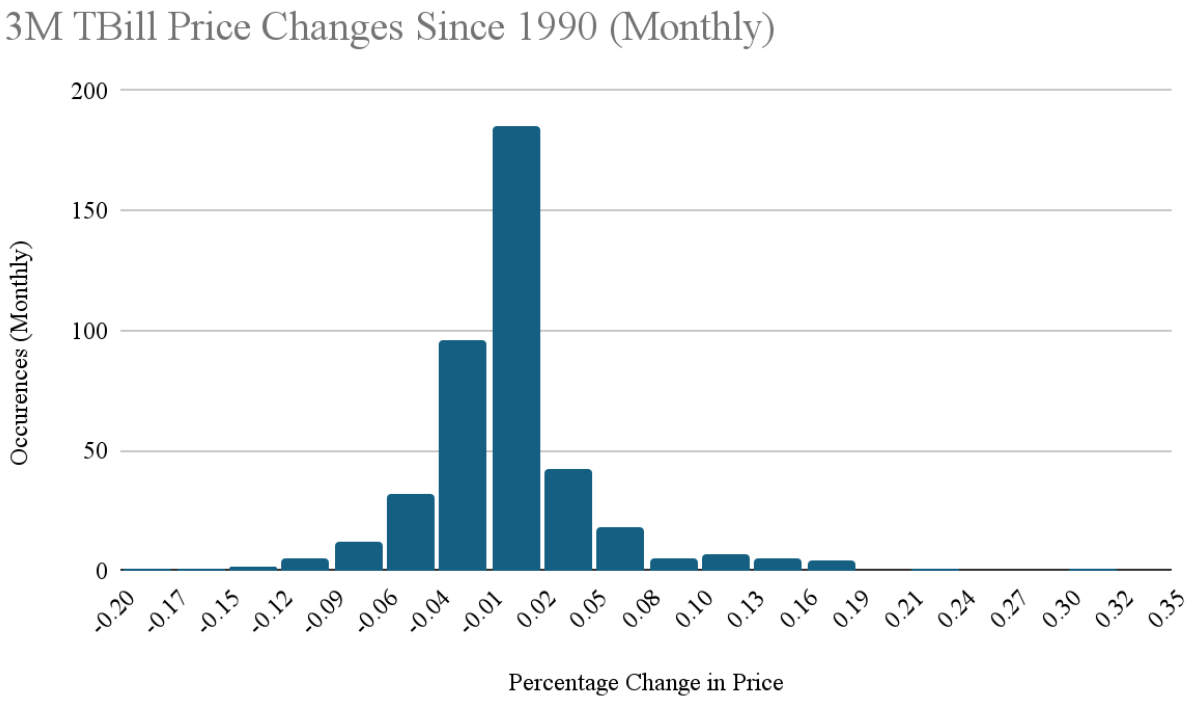


Figure B

The maximum losses in such a scenario are:

Loss Estimate			
Probability (Standard Deviations)	**Total Stablecoin Balance**		
	$1B	**$10B**	**$100B**
16% (1 SD)	-$0.476M	-$4.76M	-$47.6M
2.5% (2 SD)	-$1M	-$10M	-$100M
0.25% (3 SD)	-$1.4M	-$14M	-$140M
Proportion of Annual Revenue			
Annual Revenue (1%)	**$10M**	**$100M**	**$1B**
0.25% chance	-14%	-14%	-14%

Figure C

The table shows that while losses can be substantial, they are at most 20% of projected annual revenues.

In practice, this loss can be mitigated in several ways:

- Allow for a delay in redemptions until the TBills mature.
- Hold a portfolio of TBills, some shorter and some longer duration.
- Use revenue to create an insurance fund.
- When interest rates drop, sell off TBills at a profit and use the gains to create an insurance fund.
- Hedge out the interest rate risk by purchasing interest rate derivatives that pay out if interest rates rise.

In combination, these mitigation strategies are sufficient to mitigate the probability and severity of the risk substantially.

Appendix E: Expanded Figures

Examples of Digital Bonds			
Issuer	**Date Announced**	**Par Amount**	**Blockchain**
AXA IM (France)	Dec 4, 2023	EUR €5m	Ethereum
Swiss Canton of Zurich	Nov 20, 2023	CHF ₣100m	Six (CORDA)
Swiss Canton of Basel-City	Nov 15, 2023	CHF ₣105m	Six (CORDA)
World Bank via Euroclear (Luxembourg)	Oct 24, 2023	EUR €100m	
ABN AMRO (The Netherlands)	Sep 12, 2023	EUR €5m	Polygon
European Investment Bank	Jun 20, 2023	SEK 1b	PoCR
Bank of China Investment Holdings(BOCI) / UBS	Jun 9, 2023	CNH ¥200m	Ethereum
Tel Aviv Stock Exchange / Israeli Ministry of Finance	Jun 6, 2023	Proof of Concept	Private EVM
DekaBank	May 23, 2023	Bank certificate	SWIAT
Hong Kong Special Administrative Region	Feb 16, 2023	HKD $800m	Private
Siemens	Feb 14, 2023	EUR €60m	Polygon
European Investment Bank	Jan 31, 2023	GBP £50m	Hybrid private/public
City of Lugano	Jan 13, 2023	CHF ₣100m	CORDA
APOC / AB AMRO	Jan 10, 2023	EUR €450k	Polygon?
KfW	Dec 8, 2022	EUR €20m	Clearstream D7
European Investment Bank	Nov 29, 2022	EUR €100m	Private
UBS	Nov 3, 2022	CHF ₣375m	SIX
IDB Group / Davivienda Bank (Colombia)	Aug 23, 2022	COP $110m	LACChain
BME, BBVA, IDB	Jul 26, 0202		LACChain
PDS Group (Philippines)	Jun 2, 2022	PHP ₱11b ($210m)	STACS
OCBC / Marketnode (Singapore)	Jun 1, 2022	EUR €100m	Private EVM
Singtel/UOB/ADDX	Apr 20, 2022	USD $100m	
DekaBank	Dec 14, 2021		SWIAT
Vasakronan AB (Sweden)	Dec 6, 2021	EUR €50m	SWIAT
SIX Digital Exchange	Nov 18, 2021	CHF ₣100m	
European Investment Bank	Apr 27, 2021	EUR €100m	Ethereum
Societe Generale	Apr 15, 2021	USD $6m	Tezos
Vonovia Investment Bank	Jan 13, 2021	USD $24m	Stellar
Union Bank of the Philippines	Dec 7, 2020	USD $190m	Proprietary
Bank of Thailand	Sep 11, 2020	USD $1.6b	IBM Blockchain
Societe Generale	May 14, 0202	EUR €40m	Public Blockchain
Bank of China	Dec 3, 2019	USD $2.8b	Private
INVAO	Sep 27, 2019	USD $20m	Ethereum
Santander	Sep 12, 2019	USD $20m	Ethereum

World Bank	Aug 16, 2019	AUD $50m	Private Ethereum
Yes Bank (India)	Jul 11, 2019	USD $15m	CORDA
Societe Generale	Apr 18, 2019	EUR €100m	Ethereum
BBVA	Feb 19, 2019	EUR €35m	Proprietary
World Bank	Aug 24, 2018	USD $108m	Private Ethereum
BMO Capital (Canada)	Aug 15, 2018	CAD $250m	Open Source
NBC / JPMorgan (Canada	Apr 20, 2018	USD $150m	Quorum (EVM)
Sberbank	May 18, 2018	USD $12m	Hyperledger
Fisco (China)	Aug 10, 2017	USD 813k USD	Private Ethereum
Daimler AG	Jun 28, 2017	USD $111m	Private Ethereum

Figure 2.3.1

Smart Bond Fund Name	Ticker
BlackRock USD Institutional Digital Liquidity Fund	BUIDL
Ondo U.S. Dollar Yield	USDY
Hashnote Short Duration Yield Coin	USYC
Ondo Short-Term US Government Bond Fund	OUSG
OpenEden TBILL Vault	TBILL
Spiko US T-Bills Money Market Fund	USTBL
Anemoy Liquid Treasury Fund 1	LTF
Franklin OnChain U.S. Government Money Fund	FOBXX
Short-term Treasury Bill Token	STBT
Backed IBTA $ Treasury Bond 0-1yr	bIB01
Cash Management Pool (USDC)	MPLcashUSDC
Adapt3r Short-Term U.S. Treasury Bill Fund	tfBill
Cash Management Pool (USDC-SPL)	MPLcashUSDC-SPL
OpenTrade Fixed Term U.S. Treasury Bill Vaults	TBV
WisdomTree Floating Rate Treasury Fund - Dinari	USFR.d
DigiFT Money Market Fund Token	DMMF01
USTY U.S. Treasury Tokens	USTY
OpenTrade Flexible Term USD Vault	XTBT
Backed IBTA $ Treasury Bond 1-3yr	bIBTA
ArCoin	RCOIN
Backed ZPR1 $ 1-3 Month T-Bill	bZPR1
Swarm iShares $ Treasury Bond 0-1yr UCITS ETF	TBONDS01
Swarm iShares $ Treasury Bond 1-3yr UCITS ETF	TBONDS13
Cash Management Pool (USDT)	MPLcashUSDT
Fortunafi Tokenized Short-Term U.S. Bonds (International)	ifBILL
WisdomTree Short-Term Treasury Digital Fund	WTSYX

WisdomTree Floating Rate Treasury Digital Fund	FLTTX
WisdomTree 7-10 Year Treasury Digital Fund	WTSTX
WisdomTree Long-Term Treasury Digital Fund	WTLGX
WisdomTree 3-7 Year Treasury Digital Fund	WTTSX
WisdomTree TIPS Digital Fund	TIPSX
WisdomTree Government Money Market Digital Fund	WTGXX
Superstate Short Duration US Government Securities Fund	USTB
Fortunafi Tokenized Short-Term U.S. Bonds (U.S.)	fBILL

Figure 2.4.1

Country	Currency	Legal System	Listed Companies (NYSE/NASDAQ)
Marshall Islands	USD	Common	35
Greece	EUR	Civil	25
Switzerland	CHE	Civil	17
UAE	AED	Civil + Sharia	8
Cyprus	EUR	Common	5
Monaco	EUR	Civil	4
Bahamas	BSD	Common	3
Panama	PAB	Civil	2
Malta	EUR	Civil	1
Montenegro	EUR	Civil	0
El Salvador	SVC	Civil	0
Micronesia	USD	Common	0
Palau	USD	Common	0
Solomon Islands	SBD	Common	0

Figure 5.2.1