

CRYPTOCURRENCY BONDS: AN ATTEMPT TO MITIGATE ORIGINAL SIN RISKS

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I. INTRODUCTION

This project was inspired by El Salvador's announcement of the first sovereign "bitcoin bond." At the inception of this research, the bond was intended to be issued on March 20th of 2022. That timeline would have enabled this Note to analyze the success or failure of the first bond of its kind. The bond was delayed, and as such, this Note is a risk analysis for cryptocurrency borrowing that discusses (1) why a sovereign would issue a cryptocurrency bond, (2) whether cryptocurrency mitigates any traditional risks of borrowing in a fiat foreign currency, and (3) whether there are old risks that persist and new risks that emerge.

This Note analyzes cryptocurrency bonds through the armature of the "original sin" literature which explains why countries are unable to borrow abroad in their own local currency. It then discusses the case study of El Salvador and its prospective bond offering. Based on that case and the research, I opine that cryptocurrency has *slight* potential to mitigate certain original sin issues, but cryptocurrency also produces bountiful risks that call its utility in the debt space into question. This Note analyzes tradeoffs through comparisons with traditional financial instruments used to address the original sin problems. Lastly, the Note concludes that a cryptocurrency bond is not worth pursuing over alternatives that have been suggested as ways of overcoming original sin.

II. THE THEORETICAL UNDERPINNINGS OF ORIGINAL SIN

A. Risks Faced by Sovereign Borrowers of Foreign Currency

Eichengreen, Hausmann, and Panizza coined the term "original sin" in observation of the phenomenon that most of the world's countries are unable to borrow abroad in their own currency.¹ The authors observe that in an idealized situation, world welfare would be enhanced by free-flowing credit from capital-rich countries to capital-poor ones.² Original sin, and the bountiful economic and credit risks accompanying it, is seen as an impediment to that vision of a better sovereign debt market. This Section, analyzes the risks associated with borrowing abroad in a foreign currency. Borrowing in Cryptocurrency, being a newer formulation of the struggle to untether the weight of original sin, possesses many of the age-old risks of borrowing in a

¹ BARRY EICHENGREEN, RICARDO HAUSMANN & UGO PANIZZA, CURRENCY MISMATCHES, DEBT INTOLERANCE, AND THE ORIGINAL SIN: WHY THEY ARE NOT THE SAME AND WHY IT MATTERS, 122 (Sebastian Edwards ed., 2007).

² *Id.* at 123.

“foreign” currency, along with new risks associated with the cryptocurrency market.

Because of original sin, a currency mismatch results on the borrower’s balance sheet.³ Liabilities of a debtor must be paid in the foreign-denominated currency that they borrowed in, whereas the sovereign’s assets are comprised of local currency. The mismatch skews the exchange rate between the two currencies, which limits the flexibility of the borrower’s monetary policy.⁴ The central bank of the borrower becomes unwilling to let the exchange rate slide in order to safeguard the country’s ability to repay its debt, so they hold onto reserve currencies and aggressively intervene by raising short-term interest rates.⁵ The buildup of debt denominated in United States dollars (USD)⁶ and the volatility of interest rates heighten creditor unease about lending to the debtor.⁷ As a result, the sovereign’s credit rating drops and the country is forced to pay higher premiums on borrowing.⁸ Therefore, original sin is a self-fulfilling prophecy in which creditors refuse to lend in a local currency because of repayment uncertainties and due to the lending structure, the possibility of repayment becomes less certain.⁹

1. Risk One: Currency mismatch

Original sin results in a mismatch on a country’s balance sheet because debts are denominated in USD and assets are held in a local currency. Because of this, devaluation of the local currency causes an increase in the real value of the foreign debt stock.¹⁰ This makes debt servicing more difficult, as an increasing amount of local currency is required to repay each USD that is

³ BARRY EICHENGREEN, RICARDO HAUSMANN & UGO PANIZZA, ORIGINAL SIN: THE PAIN, THE MYSTERY, AND THE ROAD TO REDEMPTION, 10 (2002).

⁴ See *id.*

⁵ *Id.*

⁶ Throughout this essay, I use the United States Dollar (or USD) to stand-in for any number of “foreign reserve currencies.” Reserve currencies used in debt contracts include the Dollar, Pound, Euro, Franc, and Yen.

⁷ See *id.*

⁸ *Id.*

⁹ See Ricardo Sabbadini, *Overcoming the Original Sin: Gains from Local Currency External Debt*, 6-8 (Cent. Bank of Braz., Working Paper No. 484, 2018). Uncertainty about repayment comes from two sources. First, creditors may fear that locally denominated debt will be “inflated away.” Debtors are disincentivized from allowing their currency to inflate when their debt is denominated in foreign currency. Inflation of local currency makes debt servicing more difficult. For locally denominated debt, inflation can be a tool to avoid a more painful default. Even if inflation is not a concern, risk to the creditor still exists in the form of default.

¹⁰ Ettore Gallo, Maria C. Barbieri Goes, & Vinicius D. Moraes, ‘Original Sin’ in Latin America (2000-2015): Theory, Empirical Assessment and Alternatives, 40 REVISTA DE ECONOMIA 134, 138 (2019).

owed. Debtors have two options to avoid this risk and both are particularly burdensome. The first option is for the country to abstain from foreign borrowing altogether.¹¹ However, forgoing borrowing also means forgoing liquidity, which stunts development.¹² The second option is for the debtor to accumulate foreign reserves to match the debt.¹³ Such a policy would result in foregone opportunities of not spending the foreign reserves on development. Because of poor alternatives, the risk of currency mismatch is an inherent and inalienable byproduct of being restricted from borrowing in local currency.

2. Risk Two: Impact on monetary policy

Deficiencies that original sin causes in borrowing on international capital markets undermine the possibility for developing countries to stabilize their domestic economy when faced with external shocks.¹⁴ The usual toolkit available to the government for economic stability, including reducing taxes and spending on stimulus, hampers the sovereign's ability to pay back its foreign-denominated debt. These actions depreciate the local currency in relation to the reserve currency that the debt is denominated in.

3. Risk Three: Higher volatility of output and capital flows

When a country's balance sheet is characterized by foreign currency liabilities, movement in the real exchange rate generates wealth effects that lead to higher volatility of output and capital flow.¹⁵ Original sin limits the local authorities' capacity to counteract economic swings through market intervention. Because of unmitigated market swings, there is increased volatility in the real economy; goods and services may become more expensive for the population, and production is hampered. The impact of this volatility on its own obligations affects the domestic financial sector. Lastly, because a developing country's exchange rate moves with the economy in a procyclical way, the cost of servicing the debt is never optimized in relation to the sovereign's capacity to pay at any given time.¹⁶

¹¹ *Id.*

¹² *Id.*

¹³ *Id.*

¹⁴ *Id.* at 137.

¹⁵ *Id.*

¹⁶ *Id.* at 160.

4. Risk Four: Credit ratings

The inability to borrow in local currency hinders capital flow to the sovereign. The debt servicing difficulties created by original sin erode the sovereign's credit ratings and pinch the stream of capital flowing to them. Borrowing, in this situation, becomes far more expensive. Because the exchange rates are at their weakest during economically difficult times, the sovereign is least able to afford borrowing when they most need it.¹⁷ In other words, original sin produces a tandem effect that makes both debt servicing, and relatedly borrowing, more expensive.

5. Risk Five: Impact on lender of last resort function

A central bank is unable to supply liquidity to the domestic financial sector if domestic banks have debt denominated in foreign currency.¹⁸ Because they are unable to print foreign reserves, the central bank cannot bolster the financial sector in times of crisis. This exposes the domestic financial sector to greater liquidity risk as there is no party to recapitalize them or loan to them if they lose access to the international capital markets.

B. Explanations for the Presence of Original Sin and Why Transaction Cost is the Most Plausible Answer

Several theories have been proposed as reasons why certain countries are unable to borrow abroad in local currency. Eichengreen and his co-authors argue that, of the possible explanations, only the size of the country and its history of inflation and borrowing have a medium to strong correlation with original sin.¹⁹ This Section reviews the explanations that have been given for why original sin persists, with an enhanced focus on size of the country and transactional costs.

Applying a historical lens, the first theory suggests that levels of original sin today correlate with gold bonds of the past.²⁰ In the nineteenth century, there were three groups of countries: a) those that issued bonds in local currency, b) those that indexed their debt to gold, and c) those that had a hybrid of these instruments.²¹ Eichengreen found that original sin today is most prevalent in countries that indexed to gold in the nineteenth century.²² Conversely, the countries that have historically been able to issue debt in their

¹⁷ See generally EICHENGREEN ET AL., *supra* note 1, at 124.

¹⁸ Gallo, *supra* note 10, at 139.

¹⁹ EICHENGREEN ET AL., *supra* note 3, at 29.

²⁰ *Id.* at 9-10.

²¹ *Id.*

²² See EICHENGREEN ET AL., *supra* note 3, at 9.

own currency continue to be able to do so.²³ For additional historical reasons, countries that have were once global financial centers and commercial powers have retained an ability to borrow in local currency due to network externalities, despite their economy shrinking in relation to total world output.²⁴ Consider that the nineteenth century's leading financial centers (London, Paris, and the up and coming New York) are located in countries that have been and continue to be able to borrow in their own currency (the pound sterling, euro, and dollar).

The second theory involves original sin's relationship to a country's level of economic development, as well as the relative strength or weakness of their policies and institutions. Original sin was not found to correlate strongly with any of these factors.²⁵ Eichengreen and his co-authors found that development and institutional strength is a necessary, but not sufficient, factor for overcoming original sin.²⁶

The third theory involves original sin's relationship to political economy. Political economy encompasses the idea that if a country has enough domestic debt holders of local currency, they will keep the government accountable with regard to inflation.²⁷ This factor also does not bear strong correlation to original sin.²⁸

Though original sin is only weakly related to the institutional variables outlined above, the phenomenon is strongly correlated to the size of the country and the transactional efficiency related to that.²⁹ Thus, credible monetary and fiscal policies are unlikely to help a sovereign overcome its original sin, and other means must be considered.³⁰ Suggested techniques involve creating a basket of currencies of developing countries, which satisfies the relative size element through aggregation and mitigates the inflation risk of any single currency.³¹ This Note focuses on additional means that involve lowering transactional costs.

Those who can borrow in their own currency tend to be large countries.³² Considering transaction costs, the optimal portfolio contains a finite number of large-country currencies.³³ Additional currencies present the

²³ *Id.*

²⁴ EICHENGREEN ET AL., *supra* note 1, at 158. For this reason, Switzerland, despite being a smaller country, has retained the ability to denominate their debt in Francs.

²⁵ See EICHENGREEN ET AL., *supra* note 3, at 17.

²⁶ See EICHENGREEN ET AL., *supra* note 1, at 158.

²⁷ See EICHENGREEN ET AL., *supra* note 3, at 26.

²⁸ See *id.* at 25.

²⁹ See EICHENGREEN ET AL., *supra* note 1, at 154.

³⁰ Gallo, *supra* note 10, at 140.

³¹ EICHENGREEN ET AL., *supra* note 3, at 35.

³² *Id.* at 18.

³³ Gallo, *supra* note 10, at 141.

opportunity for diversification; however, each addition also comes with decreasing marginal benefits.³⁴ Further, each additional currency poses costs and risks.³⁵ At a certain point, additional currencies in a portfolio have costs that outweigh the benefits of diversification. By no fault of small countries, the world will invariably choose to invest in a few large country currencies because of the cross-border costs associated with transacting in the currencies of smaller countries. Additionally, because of the diminishing returns of diversification, each newly successful country that can issue debt denominated in local currency limits the ability of other countries to break through and do the same.³⁶

C. Overcoming Original Sin, and How Cryptocurrency Might Mitigate the Transaction Cost Issue

Two variables must be dealt with to ease original sin: the size of the country and the transaction costs associated with denominating debt in its local currency. These two topics are closely related; original sin literature suggests indexation or currency unionization as ways to eliminate certain aspects of the size and transaction cost issues.

The first solution proposed in the literature involves the issuance of bonds denominated in a basket of emerging market currencies, wherein multiple currencies would hedge against the risk of a single currency being devalued.³⁷ Another proposal involves monetary cooperation, wherein a group of countries would adhere to the same set of policies and adopt a single currency, much like the euro.³⁸ Both of these solutions relate to the relative size of the issuer. By aggregating multiple currencies in a basket, the first option eliminates some costs by centralizing the transaction in an international institution, which would serve as a single issuer. With a currency union, many small countries can band together to form a new currency to compete in scale with that of one large country's currency.

The solution to the original sin problem involves overcoming the difficulties facing emerging market borrowers due to the prevailing operation of international capital markets.³⁹ Because original sin can be explained by transaction costs limiting appetite for currency diversification, lowering those costs while maintaining the benefits of diversification is key to overcoming original sin. Blockchain—a technology underlying cryptocurrency—and

³⁴ EICHENGREEN ET AL., *supra* note 3, at 29.

³⁵ *Id.*

³⁶ *Id.* at 31.

³⁷ Gallo et al., *supra* note 10, at 150.

³⁸ *Id.* at 151.

³⁹ EICHENGREEN ET AL., *supra* note 3, at 2.

smart contracts—automatically executing agreements—have been hailed as ways of reducing transaction costs,⁴⁰ leading to this Note’s focus on cryptocurrency as a proposed antidote to original sin.

III. CRYPTOCURRENCY BONDS: A NEW WAY FORWARD?

A. El Salvador Case Study

On September 7, 2021, El Salvador became the first country to adopt bitcoin as legal tender.⁴¹ For some, especially those interested in the proliferation of the popular use of cryptocurrency, this was a fascinating first move in the long chess game of integrating cryptocurrency into daily life. For others, including international financial institutions, skeptical investors, and many Salvadorians,⁴² this move was met with concern. Similar split opinions emerged regarding El Salvador’s subsequent announcement of the first “bitcoin bond.” This Section explains the legal status of bitcoin in the Salvadorian economy, discusses how the bitcoin bond could reduce reliance on foreign currency borrowing, and concludes with some of the ramifications that El Salvador has faced to date. As a disclaimer, though plans have been discussed regarding the bitcoin bond, its conceptions have—over the lifetime of writing this Note—evolved and will continue to do so until the bonds are issued. For that reason, consider the following discussion a thought exercise rather than an analysis of the bond’s concrete terms and functions.

El Salvador’s financial position is precarious. The country has a significant debt to gross domestic product ratio, fueled by a persistently high deficit and expansionary fiscal policies.⁴³ El Salvador satiated some concerns about defaulting by paying an \$800 million loan that came due in January, 2023.⁴⁴ Through public debt dropped, it remains high and on an unsustainable path.⁴⁵ Also, El Salvador’s current account deficit rose in 2022 and the

⁴⁰ See Anders Henten & Iwona Windekilde, *Blockchains and Transaction Costs*, 1 NORDIC & BALTIC J. INFO. & COMM’N TECH. 33, 34 (2020).

⁴¹ SERGIO GORJÓN, *THE ROLE OF CRYPTOASSETS AS LEGAL TENDER: THE EXAMPLE OF EL SALVADOR* 3 (2021).

⁴² See *id.* (explaining that since the law passed that instituted Bitcoin as legal tender, there have been constant protests to the financial decisions of the government).

⁴³ IMF, *El Salvador’s Comeback Constrained by Increased Risk*, IMF Country Focus (Feb. 16, 2022), <https://www.imf.org/en/News/Articles/2022/02/15/cf-el-salvadors-comeback-constrained-by-increased-risks> [https://perma.cc/3EX9-LBGK].

⁴⁴ Alex Vuocolo, *El Salvador ‘Bitcoin Bond’ Could Ease Reliance on Foreign Debt, Says Architect*, CHEDDAR NEWS (Dec. 1, 2021, 3:14 PM), <https://cheddar.com/media/el-salvador-bitcoin-bond-could-ease-reliance-on-foreign-debt-says-architect> [https://perma.cc/N25P-FTPM].

⁴⁵ Mission Concluding Statement, *El Salvador: Staff Concluding Statement of the 2023 Article IV Mission*, INTERNATIONAL MONETARY FUND (Feb. 10, 2023),

treasury lacks access to international capital markets.⁴⁶ El Salvador's President Bukele adopted an experimental position with bitcoin and an "anything but the IMF" approach to obtaining financing.⁴⁷ The bitcoin bond appears to be an attempt to attract new loans without reliance on traditional forms of sovereign debt finance or international institutions.⁴⁸

El Salvador's first move in paving the way to the bitcoin bond was to adopt a law giving bitcoin legal tender status. The law itself is simple; it goes no further than to recognize bitcoin as "unrestricted and unlimited legal tender in any transaction, including the payment of tax obligations."⁴⁹ This mandated all economic agents to accept bitcoin as payment.⁵⁰ However, this does not affect the legal status of El Salvador's prior currency, the USD, which remains legal tender and the national currency alongside bitcoin.⁵¹ USD is used as a reference currency for pricing bitcoin transactions and the exchange rate between the fiat currency and the cryptocurrency is determined by market forces.⁵² The Salvadorian government is also establishing a public fund of \$150 million to ensure the free convertibility of bitcoin into USD.⁵³

There are benefits and challenges to the legal tender status of bitcoin. Bitcoin is volatile and a poor store of value.⁵⁴ Bitcoin and other cryptocurrencies, by their nature, are designed to run parallel to the formal financial system, allowing peer-to-peer transactions without an intermediary bank.⁵⁵ Being both peer-to-peer and digital (as opposed to tangible), transactions in bitcoin result in substantial savings of public funds for a country like El Salvador that imports its currency.⁵⁶ Importation of USD is

<https://www.imf.org/en/News/Articles/2023/02/10/el-salvador-staff-concluding-statement-of-the-2023-article-iv-mission>.

⁴⁶ *Id.*

⁴⁷ Sydney Maki, Maria Vizcaino, & Michael McDonald, *Bitcoin Bond Plan Sends El Salvador's Dollar Debt Diving*, BLOOMBERG (Nov. 23, 2021, 12:38 PM), <https://www.bloomberg.com/news/articles/2021-11-22/bitcoin-bond-on-horizon-sends-el-salvador-s-dollar-debt-diving#xj4y7vzkg>.

⁴⁸ *See generally id.*

⁴⁹ Gorjon, *supra* note 41, at 4.

⁵⁰ IMF, *El Salvador – Article IV Consultation*, Country Report No. 2022/020 (adopted Jan. 28, 2022),

<https://www.imf.org/en/Publications/CR/Issues/2022/01/26/El-Salvador-2021-Article-IV-Consultation-Press-Release-Staff-Report-and-Statement-by-the-512245> [hereinafter "Article IV Consultation"].

⁵¹ Gorjon, *supra* note 41, at 4.

⁵² Article IV Consultation, *supra* note 50; *id.*

⁵³ *Id.*

⁵⁴ Sean S. Smith, *Bitcoin Bonds & Bividends – How Crypto Has Gone Mainstream*, FORBES (Jan. 17, 2022) <https://www.forbes.com/sites/seansteinsmith/2022/01/17/bitcoin-bonds--bividends-how-crypto-has-gone-mainstream/?sh=631a03773ba1> [perma.cc/P6TK-DAZR].

⁵⁵ *Id.*

⁵⁶ Gorjon, *supra* note 41, at 3.

costly; bitcoin does not present that same expense. At present, El Salvador's bitcoin policies have resulted in a downgrade of their credit rating to CCC, limiting their market access and raising their borrowing costs.⁵⁷ In this context, El Salvador has proposed the first bitcoin bond.

Under the initial plan, the bitcoin bond represents the tokenization⁵⁸ of a one-billion-dollar sovereign debt offering.⁵⁹ What is unique about this prospective issuance is that, unlike El Salvador's other external debt (as well as the external debt of much of Latin America), the funding currency of the bond is not limited to a reserve currency. Rather, El Salvador is soliciting payment in USD, USDT (a dollar-linked stablecoin), or bitcoin.⁶⁰ By sidestepping traditional financial institutions, El Salvador is attempting to reduce their reliance on USD. Note, however, that this does not *solve* the original sin problem. Though bitcoin is legal tender in El Salvador, it is not the country's own fiat currency.

Half of the billion dollars of value raised will be put towards, or kept as, investment in bitcoin, and the other half will be put towards the creation of bitcoin mining technical infrastructure.⁶¹ Success of the bond is based on the assumption that bitcoin's price will continue to climb year after year.⁶² Following that, it is not an attractive offering for those who doubt bitcoin's continued appreciation.⁶³ The government has not released a prospectus, which means that the public must rely on information presented by President Bukele in analyzing aspects of the bond.⁶⁴

The bond is set to mature in 2032.⁶⁵ Once the government recuperates their \$500 million investment into the bitcoin mining infrastructure, 50% of bitcoin proceeds will be returned to investors as dividends.⁶⁶ Bitfinex Securities, a company which has been fined and banned in the United States,

⁵⁷ Isabella Cota, *El Salvador Expected to Default as Bitcoin Plummets*, EL PAIS (May 10, 2022), <https://english.elpais.com/economy-and-business/2022-05-10/el-salvador-expected-to-default-as-bitcoin-plummets.html> [perma.cc/95SU-T88R].

⁵⁸ Tokenization denotes the division of ownership of an asset (such as a bond issuance) into digital token that act as a share.

⁵⁹ Frank Muci, *4 Reasons Why Bitcoiners Should Pass on El Salvador's Bitcoin Bond*, COIN DESK (Mar. 25, 2022), <https://www.coindesk.com/layer2/2022/03/25/4-reasons-why-bitcoiners-should-pass-on-el-salvadors-bitcoin-bond/> [https://perma.cc/P587-3449].

⁶⁰ See Brad Mills (@bradmillsan), TWITTER (Nov. 21, 2021, 1:19), <https://twitter.com/bradmillsan/status/1462485730962325508> [https://perma.cc/94QJ-4YVV] [hereinafter "Photograph"].

⁶¹ See *id.*

⁶² Vuocolo, *supra* note 44.

⁶³ *Id.*

⁶⁴ See Muci, *supra* note 59 (noting that information in the photograph of Bukele might be inaccurate and not a reflection of the final state of the bond issuance).

⁶⁵ See Photograph, *supra* note 60.

⁶⁶ See *id.*

will prospectively be the bookrunner for the offering.⁶⁷ In a last-minute switch, the government announced that a state-owned energy enterprise would be the issuer as opposed to the sovereign itself, though this may be subject to change.⁶⁸ The Salvadorian finance minister has implied that the bond will be backed by the full faith and credit of the sovereign.⁶⁹ The issuance could be a new way for governments to borrow abroad while side stepping the limitations of reserve currency borrowing and traditional finance.

Plans regarding the bond sent the secondary market value of El Salvador's USD-denominated debt to an all-time low.⁷⁰ El Salvador's long-term bonds were trading at just over 50 cents on the dollar after the announcement because investors doubt the country's ability to repay.⁷¹ The plan to offer a bitcoin bond virtually closed the door on reaching a financing deal in 2022 with the IMF, which was already wary about bitcoin as legal tender.⁷² Bukele alleged that poor market conditions relating to global inflation and the war in Ukraine led to the bond's delay past its initial scheduled date on March 20, 2022.⁷³ On January 11, 2023, the Salvadorian Congress took a step forward by passing a digital securities law that provides a legal framework for a sovereign bitcoin bond.⁷⁴

For crypto-bonds to compete with traditional finance, a successful first attempt at an issuance might be requisite. Between the last-minute change in issuer, lack of transparency, no plans to curb the deficit, and a large amount of unsustainable debt, success may be unlikely.⁷⁵

B. Is the Bitcoin Bond Like Asset-Backed Securitization?

This Section discusses the phenomenon of denominating payment of debts in assets other than freely usable currencies or precious metals. Debt contracts of these sorts may involve various commodities (*e.g.*, oil and diamonds), or assets in state owned enterprises, future revenue streams, and

⁶⁷ *Id.*

⁶⁸ Muci, *supra* note 59.

⁶⁹ *Id.*

⁷⁰ Maki et al., *supra* note 47.

⁷¹ Muci, *supra* note 59.

⁷² *See* Maki et al., *supra* note 47.

⁷³ Casey Wagner, *El Salvador Delays Volcano Bond Issue, Unveils State-Owned Company Backing*, BLOCKWORKS (Mar. 23, 2022), <https://blockworks.co/el-salvador-pushes-volcano-bond-issue-unveils-state-owned-company-backing/> [<https://perma.cc/5EAH-MG9N>].

⁷⁴ Michael McDonald, *El Salvador Passes Law Allowing Bitcoin Bond Issuance*, Bloomberg (Jan. 11, 2023, 3:47 PM), <https://www.bloomberg.com/news/articles/2023-01-11/el-salvador-passes-law-that-would-enable-bitcoin-bond-issuance> [<https://perma.cc/VWM2-8NPZ>].

⁷⁵ Muci, *supra* note 59.

more. This Section narrows the focus to oil, which has produced unique circumstances due to its high volatility.⁷⁶ For that reason, it serves as a useful parallel to cryptocurrency denominated debt. What is central to this Section is the repayment aspect of the bitcoin bond, rather than the currency in which El Salvador is borrowing. The theory is that collateralization and repayment in cryptocurrency dividends serve as credibility mechanisms (and mutual gambles) that enable El Salvador to borrow in bitcoin and mitigate the original sin risks of USD denominated debt.

Oil can collateralize debt or serve as payment;⁷⁷ the same is true for bitcoin in El Salvador's bond. The benefit of collateralization or payment in oil is enhanced access to external financing when conventional unsecured financing is more costly or unavailable.⁷⁸ Asset-backing also mitigates original sin risks by strengthening the commitment to repay. Risks to the sovereign, on the other hand, can be extensive. Taking on this form of debt increases the cost of conventional financing because securitization shakes up creditor priority, enhancing the position of those who received securitized deals.⁷⁹ We see this effect in El Salvador as well, where the reduction in creditworthiness due to uncertainties about the bitcoin bond made traditional financing more costly. Oil contracts are expensive due to fees, interest, and strings attached.⁸⁰ Above all, these transactions jeopardize a country's control over its resources.⁸¹ In a sense, the sovereign is gambling on the future price of oil, which is ultimately unknown and unpredictable, exposing the state to liability.⁸²

Creditors are motivated to lend to secure access to the oil. Though the deals are structured as loans, they primarily serve as purchasing mechanisms in oil sales.⁸³ Debt in sub-Saharan Africa has doubled over the past decade and a large share of the debt is owed to China and commodity giants through oil-

⁷⁶ See Patrick Imam, *Collateralized Sovereign Debt – Costs and Benefits*, INTERNATIONAL MONETARY FUND AFRICAN DEPARTMENT (2019), <https://www.imf.org/-/media/Files/Countries/ResRep/ZWE/collateralized-debt-presentation-august-2019-final.ashx> [https://perma.cc/RFJ2-ECST].

⁷⁷ *Id.*

⁷⁸ *Id.*

⁷⁹ *Id.*

⁸⁰ Natasha White, *Commodity Traders: Lenders of Last Resort for Africa's Oil-Producers*, GLOBAL WITNESS BLOG (July 3, 2019), <https://www.globalwitness.org/en/blog/commodity-traders-lenders-of-last-resort/> [https://perma.cc/PL5D-AX4H].

⁸¹ *Id.*

⁸² *Id.*

⁸³ *Id.*

based contracts.⁸⁴ These resource-backed loans are seldom public and not straightforward.⁸⁵ They often do not show up in official data because the borrowers are state-owned entities rather than sovereigns.⁸⁶ The situation is ripe for corruption.⁸⁷ Because China and the commodity giants are alone in offering such loans, they are able to charge predatory interest rates and strict terms.⁸⁸ If oil production stagnates or falls, borrowers could struggle with repayment.⁸⁹

Resource-backed loans have certain advantages over traditional financing and gold-backed or dollar-pegged debt. Oil prices are variable and can mitigate the foreign currency risk associated with traditional lending because the borrower only needs to ship a predetermined amount of the commodity to the creditor, rather than selling the oil on the market to use for repayment in USD.⁹⁰ Oil and other commodities can enhance the credibility of government promises because security in a physical asset allows for recovery in case of the borrower's inability to pay with currency. While it does not serve as a commitment to maintain the value of money, it represents a mutual gamble on the part of the creditor and the debtor over the future price of the commodity.

Bitcoin, as it is structured in the Salvadorian bond, acts in a similar way. Oil and bitcoin are both highly volatile assets that serve as collateral and payment.⁹¹ They open up new borrowing opportunities for debtors, including new loans despite loss of access to capital markets and borrowing in assets other than reserve currencies. Oil-based securitization and bitcoin borrowing subvert the claims of traditional financiers, raising the costs of traditional financing. Most importantly, both the upside and downside of oil-based securitization and bitcoin borrowing are the same. Success or failure of the loan from the perspective of the debtor is hinged on price movements of the asset that their agreement is based on. If the asset's value changes, the borrower could struggle with repayment.

In El Salvador, a commitment to pay the full value of the bitcoin at the price it was lent could expose the country to substantial liability if the price of bitcoin plummets when payments come due. However, El Salvador would only be on the hook to pay creditors the coin's value when it was loaned, not

⁸⁴ Scott Carpenter, *Opaque Oil-Backed Loans Could Fuel Next African Debt Crisis*, FORBES (Feb. 29, 2020), <https://www.forbes.com/sites/scottcarpenter/2020/02/29/opaque-oil-backed-loans-could-fuel-next-african-debt-crisis/?sh=d28c77e6b1e2> [<https://perma.cc/2JX9-EFQ9>].

⁸⁵ *Id.*

⁸⁶ *Id.*

⁸⁷ White, *supra* note 73.

⁸⁸ Carpenter, *supra* note 77.

⁸⁹ *Id.*

⁹⁰ *See id.*

⁹¹ For Bitcoin, this payment is in the form of dividends.

the full value of the bitcoin at the time of repayment; therefore, appreciation in the price of bitcoin enhances their position. Similarly, with oil, only a set amount in volume must be sent to creditors as repayment. If the price of oil falls, repayment is less expensive than it would be if the debt had to be paid in the USD value of the oil at the time the agreement was reached.

C. Dollarization, Bitcoinization, and Consequences for the Central Bank

Gallo and his coauthors argue that dollarization has been the primary vehicle that developing countries use to mitigate the risk of original sin.⁹² Most countries have a limited, unofficial form of dollarization in that residents and local banks both accept and hold USD to diversify their assets and hedge against inflation of their local currency.⁹³ Full dollarization, however, is the complete *official* use of USD for all transactions in a country.⁹⁴ While dollarization does not solve all of the risks associated with original sin (such as its impact on monetary policy and lender of last resort function), it can mitigate other risks (such as currency mismatch, credit ratings, and risk premiums). Dollarization does this by eliminating the concern about sudden, sharp changes to exchange rates.⁹⁵ By eliminating the devaluation risk, a country receives lower interest rates.⁹⁶

However, dollarization has negative ramifications as well. Foremost, it requires that countries relinquish autonomy over monetary and exchange rate policies to the sovereign that issues the currency—the United States.⁹⁷ Countries like El Salvador that use the USD cannot employ some of the tools available to other central banks in addressing financial crises. Dollarization precludes a central bank from providing liquidity in an emergency because they are not permitted to print USD.⁹⁸ Dollarization also impairs the bank's lender of last resort function (an unsolved problem held over from original sin). That implies that the government cannot guarantee deposits.⁹⁹

⁹² Gallo, *supra* note 10, at 142.

⁹³ Andrew Berg & Eduardo Borensztein, *Full Dollarization: The Pros and Cons*, IMF ECON. ISSUES NO. 24 (Dec. 2000), <https://www.imf.org/external/pubs/ft/issues/issues24/> [<https://perma.cc/F3SK-PVQB>].

⁹⁴ *Id.*

⁹⁵ *Id.*

⁹⁶ *Id.* Though the risk of inflation is abetted, the possibility of default does not disappear. Dollarization is not a complete antidote to risk premiums. Market sentiment plays a large role in what the sovereign pays.

⁹⁷ *See id.*

⁹⁸ *Id.*

⁹⁹ *Id.*

Short of full dollarization, pegs are often used to preserve the value of repayment and lower a debtor's risk premium. Pegs could tie a local currency to a foreign currency, like USD, or to a basket of other currencies, like that of trading partners. It could link a local currency to a board of developing or middle-income country currencies, or regional blocs of pegged currencies could emerge. An issue with pegging a local currency to another currency is that it does not reduce the premium associated with the fear that a country could legislate to abandon the peg.¹⁰⁰ For instance, it costs more for Argentina to borrow in pesos than it does in USD, even though the currencies are pegged one-to-one. A peg can only go so far as to enable local currency denominated borrowing because of this premium.¹⁰¹

This leads to the question of whether dollarization and bitcoinization are similar in effect regarding their respective ability and inability to mitigate the risks of original sin. It has been demonstrated that dollarization reduces some of the risk premium associated with borrowing abroad, but it does not resolve original sin in two important regards. Firstly, the local currency that is being borrowed is not, in fact, "local" since the currency is imported USD. Secondly and relatedly, because USD is not a true local currency, dollarization does not resolve the impact that original sin has on the central bank's ability to manage the economy.

Important parallels can be drawn to bitcoin.¹⁰² Cryptocurrency cannot be considered a local currency in that its value is not determined by the country's economic policies but by an algorithm and investor demand for the coin. El Salvador's central bank cannot "print" and issue additional bitcoin without first purchasing it on the marketplace. This, however, is subject to an important caveat: El Salvador's stated plan for half of the proceeds of its bond issuance. El Salvador intends to use \$500 million on building infrastructure required for bitcoin mining. The Salvadorian government's ability to mine new bitcoin is a critical analog to the role of a central bank that issues its own currency. By adopting bitcoin as legal tender, the central bank has the ability to ramp up or ramp down its supply by sponsoring Bitcoin mining activity. When borrowing bitcoin, the government has a greater ability to pay it back in that they can mine for more of it. Crucial differences still exist. El Salvador's ability to mine bitcoin does not enable them to control each coin's value, and the whirl of a printing machine issuing fiat currency far exceeds the laborious and energy intensive task of attempting to mine scarce bitcoin.¹⁰³

¹⁰⁰ *Id.*

¹⁰¹ *Id.*

¹⁰² Note that bitcoin here is used as a stand-in for any cryptocurrency.

¹⁰³ It is also important that there is a finite amount of bitcoin (21 million coins). See Ayushi Abrol, *How Many Bitcoins Are There And How Many Are Left To Mine?*, BLOCKCHAIN

I conclude that borrowing in bitcoin is somewhere in between a dollarized country borrowing in dollars and a local currency country borrowing in local currency. Like dollarization, the country cannot affect the value of the currency, exposing them to certain risks. Like local currency, there is some ability to produce more of it to repay debts through mining. On balance, because the process of bitcoin mining is slow and intensive and the value of the currency cannot be controlled by the central bank, borrowing in bitcoin is more like borrowing in dollars in a dollarized country, complete with many of the same risks.

IV. THE RISKS OF BORROWING IN CRYPTOCURRENCY

A. Old Risks

To reiterate, five major risks have been outlined in the original sin literature relating to the inability to borrow abroad in one's own currency: currency mismatch, impact on monetary policy, higher volatility, impact on credit ratings, and hinderance to lender of last resort function. This Section explores whether borrowing in cryptocurrency mitigates any of the identified risks.

Currency mismatch results when the liabilities on a sovereign's balance sheet are denominated in USD, whereas assets are held in a local currency. Consequently, any devaluation of local currency equates to an increase in the real value of the foreign debt stock, making servicing the debt more expensive. When a country borrows in cryptocurrency, there are two possible modes of repayment, both of which result in a currency risk.

Under *Option A*, one unit of cryptocurrency is loaned to the sovereign, and it must be paid back in N number of USD that relates to the value of the coin that was initially loaned. The original sin risk of currency mismatch persists in this scenario. Assets are denominated in local currency or cryptocurrency¹⁰⁴—which may have appreciated or depreciated in value—and liabilities are denominated in USD. Therefore, downward movement in either the value of the cryptocurrency or the local currency makes debt servicing more difficult.

Under *Option B*, one unit of cryptocurrency is loaned to the sovereign, and one unit of cryptocurrency must be paid back when the loan matures. In this type of scenario, the value of the unit at time one ($T1$) is likely to be different from the value of the unit at time two ($T2$). Though this does not pose

COUNCIL (Mar. 10, 2023), <https://www.blockchain-council.org/cryptocurrency/how-many-bitcoins-are-left> [<https://perma.cc/M9AY-F45K>].

¹⁰⁴ Local currency denomination if the cryptocurrency was sold, and cryptocurrency denomination if the cryptocurrency was held.

the same risk of currency mismatch as *Option A*, it poses other risks because both assets and liabilities are denominated in cryptocurrency that is valued differently at *T1* and *T2*. The sovereign is vulnerable to price fluctuations under *Option B* because, if the cryptocurrency appreciates after they have spent the initial value of the unit at *T1*, they are on the hook to repay the creditor with a more valuable unit at *T2*. This risk can be avoided if the sovereign elects to hold onto the unit loaned at *T1* until it may appreciate, at which point it can be spent by the sovereign. However, there are opportunity costs associated with holding the cryptocurrency units because sovereigns will forego intended development projects. Furthermore, there is no guarantee of appreciation at any given time. Of course, depreciation of the cryptocurrency enhances the sovereign's position for repayment; however, creditors would be unlikely to accept a repayment scheme in which one unit at *T1* is repaid as one unit at *T2*. Furthermore, established cryptocurrencies such as bitcoin have a track record of appreciation over a long time period.¹⁰⁵ Assuming aversion to excessive risk on both the part of the sovereign issuer and the creditor, *Option A* is the more likely structure in practice, and it poses currency mismatch risks that do not mitigate the original sin problem. *Option B* presents its own risks, making it exceedingly unlikely to be a model for future bond issuances.

Debtors borrowing abroad in a foreign currency face the risk that the toolkit of monetary policies used to address financial turmoil hamper their ability to pay back foreign-denominated debt because the related actions depreciate the local currency. The trading value of cryptocurrency is not related to the monetary policies of the sovereign. By their very nature, cryptocurrencies run parallel to, but independently from, the official financial system. One benefit of cryptocurrency borrowing is that monetary policies affecting the value of the local fiat currency do not directly affect the sovereign's ability to repay the cryptocurrency-denominated debt.

There are two possible paths that characterize this feature. Under *Path 1*, the sovereign has not adopted cryptocurrency as legal tender. For their cryptocurrency loan to have any transactional purpose other than building a sovereign wealth fund, the sovereign would need to engage in the process of selling the cryptocurrency to fund their transacting and rebuy it (or pay in USD) when payment is due. In that sense, the need to repay the debt in cryptocurrency poses an identical original sin risk to borrowing in USD. That being said, monetary policy that reduces the value of the local currency makes it more difficult to service the debt that is denominated in something other than

¹⁰⁵ At the time of writing, bitcoin has appreciated thirty-fold over the past five years, and it had appreciated sixty-fold at its apex before the recent May 2022 slump. See John Edwards, *Bitcoin's Price History*, INVESTOPEDIA (Apr. 5, 2023), investopedia.com/articles/forex/121815/bitcoins-price-history.asp [https://perma.cc/JM8V-P27U].

the local currency. For a repurchase, devalued local currency would make buying cryptocurrency or paying a loan in USD more expensive. Under *Path 2*, however, the sovereign has adopted cryptocurrency as legal tender. Once the sovereign has acquired the cryptocurrency loan, it can transact with it because the law requires economic actors to accept cryptocurrency payments. Furthermore, stimulus and tax cuts will not affect the exchange rate of the cryptocurrency because the value is derived independently of the sovereign's actions.¹⁰⁶

Another risk associated with borrowing abroad in a foreign currency is the volatility of output and capital flows. In other words, the exchange rate moves in a procyclical way, meaning that the debtor's obligations are not in line with their ability to pay at any given point. Because of exchange rate movement, debt servicing costs less when the sovereign can afford it, and debt servicing costs are greater when the sovereign is not able to afford it. As a result, exchange rate movements affect capital flows during downturns. The risk analysis for cryptocurrency's role in this is similar to that of currency mismatch risk, as the problem stems from the impacts that original sin has on exchange rates. Suppose debt is a set monetary value instead of a set number of coins. In that case, the appreciation of cryptocurrency enables the sovereign to skirt around the volatility risk relating to procyclical exchange rates. Conversely, if the cryptocurrency depreciates, the risk is only exacerbated as the value of the asset borrowed depreciates below the value of the debt. Cryptocurrency presents its own parallel volatility risks, irrespective of the exchange rate between the local currency and the USD. While not procyclically aligned with the sovereign's economy, cryptocurrency borrowing can impact output and capital flow with as much fury.

Credit rating degradations present another risk. Caused by the widening exchange rate and the diminishing ability of the sovereign to service its debt, rating agencies' assessment of the borrower's creditworthiness will be less favorable. As mentioned above, the risk of currency mismatch persists in the cryptocurrency context if sovereigns must repay the dollar value of the coin to creditors. In addition, the volatility of cryptocurrency can make debt servicing unpredictable and difficult. Both of these factors weigh against creditworthiness. Furthermore, demonstrated by El Salvador's CCC rating after their issuance proposal, markets react negatively to the issuance of bitcoin bonds. At the moment, traditional financial institutions do not look favorably upon cryptocurrency debt.

The last major risk identified in the original sin literature is the inability of the central bank to act as a lender of last resort when debt is owed in a

¹⁰⁶ The important caveat is that the government is not able to "print" more cryptocurrency. This will be discussed later in this Section.

foreign denomination. The previous Section contains a long-form discussion of this topic, but the same risk applies to borrowing in cryptocurrency. The central bank cannot print cryptocurrency; the caveat is that the government can establish infrastructure to mine new crypto-coins. However, the labor, expense, and lack of liquidity associated with this process renders it incomparable to a central bank's powers when debt is denominated in local currency.

B. New Risks

Earlier, this Note compared cryptocurrency-denominated debt to debt linked to commodities, such as oil.¹⁰⁷ Though there are parallels that I have outlined, the main issue with this characterization is that cryptocurrency does not fit neatly into the commodity category.

Though the Commodity Futures Trading Commission has labeled cryptocurrency as a commodity, cryptocurrency is more amorphous than that. It is somewhat of a currency/commodity/security hybrid.¹⁰⁸ Though cryptocurrencies can, and do, function as currency for transacting, they are too volatile to be a stable store of value.¹⁰⁹ Like securities, they have public offerings in the form of initial coin offerings and trade on exchanges. However, because there may be no common enterprise associated with a coin and no expectation of profits based on the efforts of others, they arguably do not pass for the typical definition of securities.¹¹⁰ That leaves us with commodities, like oil and gold, both of which can also take on currency and security-like tendencies.

The issue with cryptocurrencies as commodities is that their supply is not clearly ascertainable: more coins are produced every day and they are never destroyed. A potentially unlimited number of coins from various issuers can be "produced." No one can know whether there will be a market for any given cryptocurrency tomorrow.¹¹¹

What follows is a discussion of an old risk with new implications. When a government denominates obligations in a commodity and it becomes

¹⁰⁷ *Supra* Section 2, Part B.

¹⁰⁸ See Tom Wilson, *Is it a Currency? A Commodity? Bitcoin has an Identity Crisis*, REUTERS (Mar. 3, 2020), <https://www.reuters.com/article/us-crypto-currencies/is-it-a-currency-a-commodity-bitcoin-has-an-identity-crisis-idUSKBN20Q0LK> [<https://perma.cc/BA7J-K6CF>].

¹⁰⁹ *Id.*

¹¹⁰ See generally, Embroker Team, *What is the Howey Test & Does Crypto Pass? The 4 Elements*, EMBROKER (Apr. 15, 2022), <https://www.embroker.com/blog/what-is-the-howey-test-does-crypto-pass/> [perma.cc/3DYK-XHEC] (discussing the securities law Howey Test).

¹¹¹ I wrote this during a time when *Terra (LUNA)*, a once popular cryptocurrency trading at over \$100 per coin, crashed to \$0 in a single day, and *Bitcoin* lost half of its value as well.

too expensive to repay the obligations in that denomination, there are legal implications to changing contractual terms relating to payment. This happened in the United States during the Great Depression, when the government's gold-denominated obligations would have bankrupted the country. The government's response was to pass legislation to circumvent contractual terms and pay in dollars. In the cases that followed this move, the Supreme Court ruled that because gold had been made unlawful to hold or use as tender by legislative decree, there were no damages owed to plaintiffs for breach of contract.¹¹² The value of the gold in USD was still owed to plaintiffs, but the government was free to exercise its monetary policy to affect the currency in a way that they could not with gold.

Does this mean that El Salvador could eventually make holding and using bitcoin illegal to skirt their obligations to pay creditors in a time of need? The answer is most likely no; the debt that prospectively would be owed by El Salvador must be paid in the value of the bitcoin at the time of the loan, not in the unit of bitcoin itself. Arguendo, this Note explores both possibilities.

Under *Option A*, where El Salvador owes the value of the initial loan to their creditors, making use of bitcoin illegal will simply trigger an obligation to pay the value of the coin at the time of the loan in USD. Not only does this fail to avoid the risks of original sin, but it does not ease El Salvador's ability to service the debt because they do not have control over the supply of USD.

Under *Option B*, where El Salvador owes the unit of bitcoin itself, the illegality of bitcoin in El Salvador does not impact the rights of their external creditors who reside in jurisdictions where bitcoin is legal for transactional purposes. In other words, making bitcoin illegal is only a move that El Salvador can use in relation to its domestic debt. This was the result when Argentina attempted to use the precedent of the Gold Clause Cases to argue for the "pesification" of their debt obligations.¹¹³ During a financial crisis in 2001-2002, the Argentine government rewrote USD denominated contracts to be paid in pesos. The local court ruled that the government was able to do this to protect constitutional order. They determined that plaintiffs could not claim damages as a result of pesification because the same purchasing power was being returned to them, even though the denomination had changed.¹¹⁴ This has largely been viewed as intolerable internationally.¹¹⁵ More than forty investment treaty arbitrations were brought challenging the Argentine decision at International Centre for Settlement of Investment Disputes, and by and

¹¹² Angus D. MacLean, *Outline of the Gold Clause Cases*, 15 N.C. L. REV. 249, 252 (1937).

¹¹³ See Horacio Spector, *Don't Cry for Me Argentina: Economic Crises and the Restructuring of Financial Property*, 14 FORDHAM L.J. 771, 777 (2009).

¹¹⁴ MacLean, *supra* note 112, at 288.

large, Argentina has not been successful in applying the Gold Clause precedents to their international obligations.¹¹⁶

The main takeaway is that obligations to pay in cryptocurrency pose unique risks and looking to history can reveal likely outcomes. A sharp change in value of the cryptocurrency borrowed could make it impossible for the borrower to repay the loan. If the obligation is to pay back the unit of cryptocurrency, fluctuations in price can make it extremely difficult to garner the coins necessary to make payments. Contractual changes that make the denomination anything other than USD would likely result in challenges brought by investors. Given Argentina's experience, it is unlikely that another borrower would succeed.

Transitioning to other new risks, the IMF raises several red flags relating to the domestic economy's exposure to cryptocurrency. Foremost, the IMF suggests a financial stability risk. Cryptocurrency is widely noted as an unsuitable store of value due to its volatility.¹¹⁷ Importantly, the volatility is unpredictable and not tied to market fundamentals.¹¹⁸ This makes it particularly difficult to plan for price fluctuations, rendering the anticipation of debt servicing costs impossible to pin down.¹¹⁹ The instability associated with cryptocurrency can result in extreme, persistent, and noncyclical fluctuations in the domestic price of goods and services.¹²⁰ Monetary policy could lose its bite because autonomy over quantity, exchange, and value of money is surrendered to an unknown source.¹²¹ This risk is nearly identical to that faced by sovereigns borrowing in USD, but cryptocurrency is exceedingly less transparent and less predictable.

Consumer protection risk is outlined as another concern. Because of the fluctuation in value of the currency that is borrowed and dispersed into the economy, consumers could lose wealth due to swings.¹²² Domestic banks face the risk of being exposed to massive fluctuations in asset values, requiring them to hedge further and take on additional liquidity requirements.¹²³ Further liability risks can result if the government needs to borrow more to fund the free conversion between cryptocurrency and fiat currency.¹²⁴

Lastly, the IMF cites operational risks associated with introducing cryptocurrency to the economy. One is the degradation of financial integrity:

¹¹⁶ *Id.*

¹¹⁷ See Article IV Consultation, *supra* note 40.

¹¹⁸ See generally Tobias Adrian, *The Promise and the Risk of Crypto Assets*, IMF PODCASTS (Oct. 8, 2021) (downloaded using Spotify) [hereinafter "IMF Podcast"].

¹¹⁹ Gorjon, *supra* note 41, at 7.

¹²⁰ *Id.*

¹²¹ *Id.*

¹²² IMF: El Salvador's Increased Risk, *supra* note 43.

¹²³ *Id.*

¹²⁴ *Id.*

cryptocurrency borrowing could open the door to illicit money, terrorist financing, and tax evasion.¹²⁵ The borrower also exposes their currency to cyber-attacks if proper security measures are not in place.¹²⁶ Another potential hindrance to the success of cryptocurrency borrowing is low internet availability for much of the population in the developing world.¹²⁷ In sum, risks surrounding the technology and its volatility prevent the IMF and other commentators from embracing the issuance of cryptocurrency denominated debt and its status as legal tender.

V. CONCLUDING REMARKS AND RECOMMENDATIONS

Because of the transaction costs of holding a diverse portfolio of currencies and deeply rooted financial histories, developing countries are unable to borrow abroad in their local currency. This poses five aforementioned risks to the sovereign, outlined above in the Note. Borrowing in cryptocurrency is a recent advent that professes to mitigate risk and enhance a sovereign's flexibility with borrowing. Cryptocurrency debt offerings share characteristics with past techniques used to mitigate risk, such as dollarization and linking debt to commodities, but present unique new challenges. This Note has demonstrated how borrowing in cryptocurrency does not enable a sovereign to break away from original sin, and moreover, it does not sufficiently mitigate the risks associated with being unable to borrow in locally-denominated currency. In fact, the technology's novelty and volatile nature compound upon risks that already exist. For that reason, the IMF, World Bank, and credit rating agencies look to El Salvador's bitcoin bond with skepticism.

In closing, it is my opinion that cryptocurrency bonds are not an effective path to pursue. To mitigate original sin, developing nations and emerging markets should consider a currency board or other means of increasing the size and stability of their collective currencies in such a way that makes lending them local currency an attractive medium. Sovereigns could, and should, invest in cryptocurrency mining infrastructure if they view the technology as part of their future, but the ability to mine additional coins is not a replacement for the flexibility of a central bank in regulating monetary policy to optimize debt servicing.

In the end, borrowing in cryptocurrency may just be a less predictable analog to borrowing in USD. The sovereign has no control over supply and monetary policy, a mismatch appears on their balance sheet, and old and new risks riddle the arrangement. The borrowing represents a gamble on

¹²⁵ *Id.*

¹²⁶ *See* Adrian, *supra* note 118.

¹²⁷ Cota, *supra* note 56.

resurrection—a role of the dice with the economy at stake—a bet on whether the cryptocurrency will appreciate or fall. The fact of the matter is, if El Salvador successfully issued its bitcoin bond on March 20, 2022 as they intended, it would be worth have lost two-thirds of its initial value at the height of the so called “crypto-winter,” and it would still be down one quarter of its initial value today, an entire year later.¹²⁸ On balance, the minor ways in which cryptocurrency borrowing mitigates original sin do not make up for the excessive risk, volatility, and lingering concerns associated with borrowing abroad in a foreign—or digital—currency.

¹²⁸ Note that this sentence was written based on the value of Bitcoin on May 14, 2022.