Decentralized Money Supply: A New Paradigm for Reserve Currencies

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Abstract

This paper proposes a decentralized currency, the Global Dollar (GD), designed as an alternative reserve currency for global trade. From the perspective of banks and their customers, the GD is just another currency like the US Dollar (USD). Customers of banks can transact in GD using the same technologies that they now use to transact in the USD. However, no central bank or group of central banks has special powers over the GD. Users collectively manage the money supply of the GD via a unique bond auction mechanism. We validate the mechanism using a simple model. We compare the GD to the USD, highlighting its potential advantages, and explore strategies for implementation. The goal is a robust alternative to centralized global reserve currencies.

1. Introduction

The US Dollar (USD) has reigned as the global reserve currency for decades, but its dominance comes at a steep cost. By tying the world's financial system to the monetary policy of a single country, the USD amplifies economic instability in other countries and fuels persistent US trade deficits [1, 2]. Foreign demand for USD reserves distorts markets, while the US Federal Reserve's centralized control prioritizes domestic interests, often at the expense of stability in other economies. These challenges underscore an urgent need for a decentralized alternative that can serve as a robust global reserve currency.

This paper introduces the Global Dollar (GD), a decentralized reserve currency designed to transform global trade. From the perspective of banks and their customers, the GD functions almost identically to the US Dollar (USD): banks issue GD deposits and loans, and customers conduct transactions using existing payment systems without needing new technology. Unlike traditional fiat currencies, however, no central bank or group of central banks has special control of the money supply in the GD system. Instead, its users—banks, central banks, and individuals—collectively manage the money supply through a transparent bond auction mechanism. Central banks conduct monetary policy by holding, trading and lending bonds and GD reserves. The GD's minimalist rules are a key strength, offering a framework simple enough for a coalition of central banks, representing countries with varied economic priorities, to reach consensus on its adoption.

The design of the Global Dollar is discussed in Section 2. In Section 3, a simple model is used to validate the bond mechanism. Section 4 explores how central banks might interact with the GD

to implement monetary policy. Section 5 examines the features that make the USD the dominant global reserve currency and compares the GD to the USD based on these features. Possible strategies for implementing the Global Dollar system are outlined in Section 6.

2. Global Dollars with a Decentralized Money Supply

The GD is designed to function like the USD for banks and their customers, while offering a decentralized money supply. This section outlines the rules governing the GD and its unique bond auction mechanism. These rules could be enforced by a new independent *Global Central Bank* (GCB) that administers a *global reserve*. Alternatively, the global reserve could be implemented on a blockchain with a cryptocurrency [3, 4] that enforces the rules of the reserve, effectively creating a distributed algorithmic GCB.

2.1. GD Bonds

A crucial role in the GD is played by GD bonds:

Definition 1. *If d is a date and $r \geq 0$, $\mathsf{Bond}(r, d)$ is a financial instrument that automatically generates r GD on each day that it is active. On date d, $\mathsf{Bond}(r, d)$ expires and is replaced with* 1 *GD.*

Unlike US Treasuries, GD bonds are not tied to the spending of any institution. Their purpose is to generate new GD, and serve as a safe-haven asset. Users of the global reserve—such as central banks, banks, and individuals—hold accounts containing GD reserves and bonds. These can be freely exchanged between accounts within the reserve, but they never leave the global reserve. The GD reserves generated by bonds are added to the accounts of the users that hold the bonds.

2.2. Bond Auction Mechanism

The supply of GD within the global reserve is controlled by users of the reserve. They exert their control by bidding in auctions for GD bonds that are issued by the GCB and held in accounts at the reserve. New bonds in the reserve are issued according to the following rule:

- **Bond Rule:** If the number of bonds in the global reserve is less than the number of GD in the global reserve, a new bond is issued by the GCB and sold in an auction open to all users. Let d_0 be the current date, d be a date in the future and $r \geq 0$ be a number satisfying $r \cdot (d - d_0) \leq 1$, so $\mathsf{Bond}(r, d)$ can yield at most 1 GD during its lifetime. Each user may submit a bid to the GCB of the type:

  $$\text{user A bids for } \mathsf{Bond}(r, d),$$

  indicating that user A is willing to pay 1 GD to obtain a $\mathsf{Bond}(r, d)$. The parameters r, d are chosen by user A, and not by the GCB. The winning bid is the one with the smallest yield r. The bond corresponding to the winning bid is issued to the winner, and 1 GD is deducted from the account of the winner.

This concludes the rules enforced by the GCB on the global reserve. The rest of this section is dedicated to explaining the consequences of these rules.

2.3. Intuition

Each GD bond costs 1 GD and expires as 1 GD, so new GD reserves emerge in the global reserve only in the form of GD bond yields. The GCB issues bonds of the lowest possible yield, while maintaining the invariant that half of the GD is invested in bonds at all times. The yields and durations of active bonds in the system are determined by users through their bids in the auctions.

The winning yield in the auction is a measure of the current time value of money. Large yields indicate that GD reserves are more valuable now than in the future, and small yields indicate the opposite. The effect is that more GD reserves are generated when they are demanded by the market.

The condition $r(d-d_0) \leq 1$ ensures the robustness of the mechanism. It is equivalent to asserting that every GD bond can yield at most 1 GD during its lifetime. Without it, a period of volatility might lead to a single auction that issues a bond generating very large total yield.

2.4. Banking and Transactions

Banking with the GD is nearly identical to banking with the USD. Banks are allowed to issue GD deposits held in the accounts of their customers. Just as banks issue deposits in the USD that exceed the supply of USD reserves, they may issue deposits in the GD that exceed the available supply of GD reserves held in the global reserve. Banks may issue GD loans to customers using mechanisms identical to the ones they use to issue USD loans. GD bank deposits are regulated locally by central banks or governments, not by the GCB. The GCB places no restrictions on GD bank deposits, and this paper places no restrictions on banks or central banks.

Transactions involving GD deposits are carried out using existing banking infrastructure, without any GCB oversight. Customers of banks need not interact with the global reserve at all. If a cryptocurrency is used to implement the GCB, customers of banks need not interact with the blockchain. This means that a blockchain based implementation of the GCB need not be particularly efficient or fast.

Net flows between banks or countries are ultimately settled by transferring GD in the global reserve from one account to another. This limits the ability of countries or banks to issue excessive GD deposits, because doing so risks a liquidity crisis and threatens the financial stability of the local banking system.

2.5. Money Supply Dynamics

The rules enforced by the GCB on the global reserve have the following consequences:

1. **Bonds vs GD**: The number of bonds and GD in the global reserve will typically be very close to each other. Every bond eventually turns into a GD, so if the bonds exceed the GD, bonds will be replaced by GD until the GD are in excess. The bond rule ensures that as soon as the bonds drop below the GD, new bonds are issued. The new bonds will surely be purchased at some yield. This will consume GD until the two quantities are back in equilibrium.

2. **Churn**: The average daily volume of bonds sold via the bond rule is determined by the duration of bonds held by users in the system. If most bonds are of long duration, the volume will be small. If the bonds are of short duration, the volume will be large. If the daily volume is large, the system will reserve the capacity to allow users to quickly increase the money

supply by bidding for high yielding bonds. The churn of the system is determined by users of the system.

3. **Secondary Markets and Arbitrage for Bonds and Liquidity**: Because users are allowed to exchange both bonds and GD within the reserve, secondary markets for these instruments will emerge. Arbitrage between secondary markets and the auctions on the reserve will ensure that bond yields in the auctions are consistent with the prices in the secondary markets. Similarly, there will be arbitrage between GD yields and interest rates for inter central bank GD loans and inter bank loans. Arbitrage ensures that large interest rates for loans to relatively safe financial institutions will lead to large GD bond yields.

4. **Liquidity and Central Banks**: Secondary markets will allow the GD money supply to grow based on information available throughout the financial system. During periods where liquidity is in great demand, new GD reserves will emerge at a high rate. Users that anticipate the increased demand for GD reserves will sell GD bonds in favor of GD reserves, knowing that they can later obtain GD bonds of higher yields. In periods where the financial system is very stable and ample GD reserves are available to carry out all transactions, GD bonds will be in high demand, and consequently yields will fall. The crucial difference between the GCB and the implementation of the Fed is that the market has the final say on the dynamics of the money supply in the GD system. The power to generate money is distributed across all users of the system.

   Central banks like the Fed are crucial to providing USD liquidity during financial crises and maintaining the stability of the financial system. The same role can be played by central banks in the GD system. Although the GCB is not allowed to deviate from the rules above, central banks can choose to lend GD to each other, and central banks can lend to banks in their jurisdiction to provide liquidity when it is needed. As a liquidity crisis begins to emerge, arbitrage between the interest rates of GD loans and GD bond yields will lead to the GCB generating new GD, which can be routed where it is needed. Because the rules of the GCB are known to the market ahead of time, a panic in the financial system is likely to end before it gets started, and channels to route liquidity are likely to be created by central banks and banks without any change to the rules followed by the GCB. We explore how central banks might adapt to the GD in Section 4.

2.6. Fairness and Incentives

The rules of the GCB have the following consequences for the fairness, security and incentives for users of the global reserve:

1. **Fairness**: The system is fair in two ways: all users can participate to determine the rate of growth of the money supply, and all users have fair access to the newly generated money. A coalition of users that controls a large fraction of the bonds and GD can cause the money supply to grow at a high rate, but the generated money will accrue to all users: every user that takes part in the auctions should expect to maintain their share of the GD and bonds in the system over time.

2. **Hoarding vs Spending**: Currencies backed by a fixed supply, like gold or Bitcoin, favor hoarding rather than spending. As the number of transactions increase, the supply of the

currency per transaction decreases. This steady increase in demand for the currency incentivizes users to hoard it and spend something else. In contrast, the incentives for the Global Dollar are similar to those for the USD. The favored strategy is to hoard GD bonds and spend GD. It is the bonds that help to preserve value, while the GD lose value as the money supply increases. Each bond eventually becomes a GD, so users cannot simply buy and hold bonds forever; users are incentivized to buy new bonds and contribute to the churn of the system.

2.7. Omitted Details

Any implementation of the Global Dollar system will need to make decisions about details that have been omitted here. The auctions in the bond rule will have to be implemented efficiently, allowing for many bonds to be sold at once. Transaction costs will have to be taken into account. Care must be taken to ensure that the bids of the users are sealed so that one user cannot win the auction by looking at the bids of others.

3. Model Validating the Mechanism

Suppose a banking system consists of banks that hold R reserves and D deposits. Each bank is required to maintain a reserve ratio of κ, so $R/D \geq \kappa$: each dollar of reserve can be used to generate $1/\kappa$ dollars of deposits that can be lent to borrowers. Each dollar lent out to borrowers defaults with probability δ, and is repaid with interest ρ with probability $1 - \delta$. In this model, money that is lent to a defaulting borrower ultimately returns to the banks in the form of a loan repaid with interest.

Thus, each dollar of reserve can be used to generate

$$(1/\kappa)(-\delta + (1-\delta)(1+\rho)) - 1/\kappa = (\rho - 2\delta - \delta\rho)/\kappa$$

dollars of reserves for the bank that is making the loan after one time step. To maintain stability in such a system, an idealized central bank must generate reserves at the rate of $(\rho - 2\delta - \delta\rho)/\kappa$.

Now, imagine that the GCB is adopted, so the banks hold R GD reserves and B GD bonds, with $B = R$ in steady state. The bonds earn a yield of r that is determined by auctions. For each GD reserve, a bank can choose to either invest it in GD bonds or use it to lend to borrowers and earn a return. Arbitrage will ensure that the yield of GD bonds r is the same as the return that can be earned using each unit of reserve: $r = (\rho - 2\delta - \delta\rho)/\kappa$. This means that in steady state, each bond yields $(\rho - 2\delta - \delta\rho)/\kappa$, and the rate of growth of R is identical to the rate of growth determined by the ideal central bank.

Of course, this model is overly simplified. Banks would certainly prefer the safe return guaranteed by GD bonds to the volatile returns given by borrowers, unless the borrowers offer better returns. Moreover, the parameters ρ and δ are determined by the market based on the level of risk that banks are willing to take. In a real system incorporating the GD, all of these parameters, including the yield r of the bond rule, would be determined by the market.

4. Central Banking with Global Dollars

Many central banks would prefer the GD system over a fiat currency because it mitigates the risk of financial contagion from a single country's mismanagement. In the GD system, central banks

can collectively shape money supply growth, ensuring no single entity disproportionately influences global liquidity. The minimalist framework of the GD makes it easy for most central banks to commit to the GD system, because they still retain significant flexibility to conduct monetary policy. A bank that runs out of GD reserves faces failure. Governments and centrals banks will adapt to this hard constraint by planning to prevent such failures and so maintain the stability of their banking systems.

Just as non-US central banks today amass USD reserves in order to handle liquidity crises or attacks on their local currencies, central banks and banks would need to amass GD reserves and GD bonds. If a bank is in danger of running out of reserves, the central bank could step in to provide a loan of reserves, or orchestrate such loans from other banks in the country. The banks and central banks can sell their amassed bonds on the secondary market, where they will be purchased by central banks and banks in other countries. If the crisis escalates to affect many countries, the yield r of the winning bid in the bond rule will rise, and the GCB will generate a flood of liquidity that can be routed to the affected countries.

4.1. General Principles

Central banks can implement monetary policy by [5]:

- **Adjusting local reserve ratios**: Higher ratios tighten credit; lower ratios encourage lending.
- **Setting interest rates for loans to banks**: Higher rates discourage lending activity; lower rates stimulate it.
- **Trading GD bonds**: Buying bonds on secondary markets reduces yields, tightening conditions; selling bonds increases yields, easing conditions.
- **Directly bidding in bond auctions**: Bidding for low-yield bonds slows money supply growth; high-yield bids accelerate it.
- **Negotiating with other central banks**: The above levers can be applied simultaneously by a group of central banks that reach an agreement.

4.2. Case study: a single central bank

In order to understand how central banks can use the GD to maintain stability in their banking systems, we start with a toy example: a financial system where there is only one central bank.

Normal times

Figure 1 shows how the system might behave in normal times. The central bank currently holds 5T in GD, and 4T in GD bonds which yield 1% annually. The central bank offers overnight loans to its banks at an annual interest rate of 2%. The banks offer loans to borrowers at the rate of 6%, and also invest in GD bonds yielding 1%. Some fraction of the borrowers do default on their loans, but the defaults do not lead to a panic and the system is stable. In anticipation of potential future crises, the central bank maintains a large holding of GD bonds of short duration. This ensures that the system has high churn if/when a crisis does arrive.

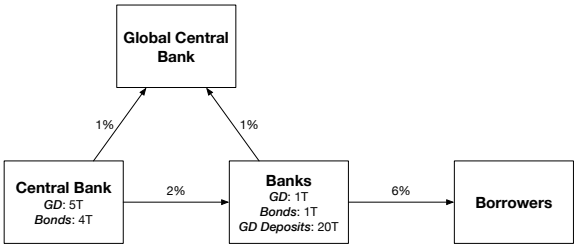

Figure 1: Interest rates during normal times.

Monetary policy

The central bank conducts monetary policy by changing the interest rates it charges banks, trading bonds, and participating in the auctions of the bond rule. To tighten financial conditions, the central bank takes the following actions:

- Raises the interest rates for loans to banks.
- Buys GD bonds on secondary markets.
- Bids for low yielding bonds at the auctions of the bond rule.
- Imposes a higher reserve ratio requirement, forcing banks to increase their ratio of reserves to deposits.

These actions reduce GD bond yields, and make it harder for banks to issue new loans. If the central bank wants to ease financial conditions, it takes the opposite actions:

- Lowers the interest rates for loans to banks.
- Sells GD bonds on secondary markets.
- Bids for high yielding bonds at the auctions of the bond rule.
- Lowers the reserve ratio requirement, allowing banks to decrease their ratio of reserves to deposits.

These actions increase GD bond yields and encourage banks to issue new loans.

Liquidity crisis

Figure 2 shows what happens when the system experiences a liquidity crisis. Many borrowers have unexpectedly defaulted, and the result is that many banks are about to run out of GD reserves. Here is how the crisis may play out. As the crisis worsens, the banks sell their GD bonds to obtain GD reserves on the secondary market. Suppose that fails to end the problem. The banks are no longer willing to lend to each other because of the panic, and all parties are hoarding GD reserves. The central bank decides to implement a bailout. It takes control of the banks and enforces a freeze, preventing customers from withdrawing significant bank reserves from the banking system. During the period of the freeze, the central bank is the most significant bidder in the bond rule, so it is able

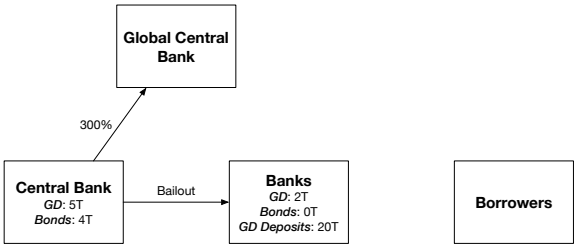

Figure 2: A liquidity crisis

to obtain high yielding bonds from the GCB. The central bank wins these auctions and reassures the market that the obtained GD reserves will be used to bailout the banks by providing the banks with loans on favorable terms. After the panic settles, access to bank deposits is restored. So, bank failures are ultimately prevented by generating new GD using the bond rule.

This single central bank example resembles the current system, where the Fed has sole control of the money supply and is able to generate liquidity and settle a crisis in whatever fashion it deems necessary. However, there is an important difference: in the GD system, investors that predict a liquidity crisis ahead of time can sell GD bonds and acquire GD on the reserve to prepare for the crisis. This reserve GD can be used during the peak of the crisis to take part in the auctions and obtain the same returns that the central bank obtains from the bond auctions. In this way, investors can profit from predicting the crisis. Consequently, the central bank also gets an important market-based signal of an impending crisis: escalating GD bond yields in the secondary market indicate trouble ahead.

In fact, because all parties in the system can make predictions about the behavior of the central bank and banks ahead of time, it is quite likely that a liquidity crisis will simply fail to emerge because of action in the GD bond market. Anticipating that a crisis will emerge, market participants are incentivized to sell their GD bonds to acquire GD reserves before the central bank takes any actions. This activity will naturally lead to rising GD bond yields and a flood of new liquidity generated by the GCB, which may well resolve the liquidity crisis before it takes hold.

4.3. Case study: 2 central banks

The main use case of the Global Dollar is as a global reserve currency. Let us explore an example involving two countries with separate financial systems that both interface with the Global Dollar.

Normal times

Figure 3 shows an example with 2 countries that use the GD. These central banks each manage the banks of their own countries, but they are also willing to lend to each other at a certain interest rate to manage short term issues. The central banks maintain large holdings of GD bonds of short duration to ensure that the system has the churn available to deal with a future crisis.

Monetary policy

It is difficult for any one central bank to unilaterally ease or tighten financial conditions in the GD system. This is a feature of the system, not a bug. However, central banks do have some

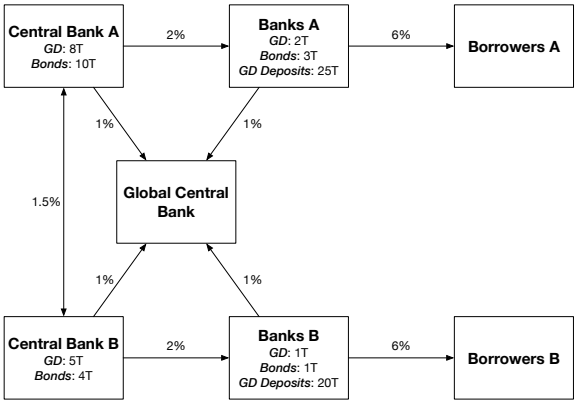

Figure 3: Interest rates in normal times

influence in their local system. If a central bank wants to tighten financial conditions in its local economy, it can take the following actions:

- Raise reserve ratio requirements for banks in its jurisdiction.
- Raise interest rates for loans to banks in its jurisdiction.

These two actions encourage banks to reduce lending activity. A single central bank has limited ability to move GD bond yields without the cooperation of the second central bank, and an attempt to buy bonds at above market rates could backfire and result in a loss in relative holdings of reserves. Similarly, the central bank can loosen conditions in its local economy by taking the following actions:

- Lower reserve ratio requirements for banks in its jurisdiction.
- Lower interest rates for loans to banks in its jurisdiction.

Again, it is not very easy for a single central bank to unilaterally influence bond yields to increase the supply of GD reserves.

Liquidity Crisis

Imagine that an unexpected GD liquidity crisis in country B emerges because of large scale defaults. Figure 4 shows what might happen. Central bank B and the banks in B first attempt to stop the crisis from taking place by selling their bonds on secondary markets to obtain reserves. If that fails to end the panic, and central bank B still does not have enough GD reserves to save its banking system, central bank B can appeal to central bank A for help. Central bank B restricts withdrawals of GD reserves from banks in B for a short time. Central bank A negotiates with central bank B, offering B loans at a high rate of interest and demands that austerity measures are implemented at banks in B. It raises interest rates in its local system to recover GD reserves and obtains high yield short-term bonds from the GCB. After sufficient GD reserves have been secured and channeled to central bank B, and confidence has been restored in the banks of B, customers in B are allowed full access to their deposits. However, country B is now in debt to country A. If an

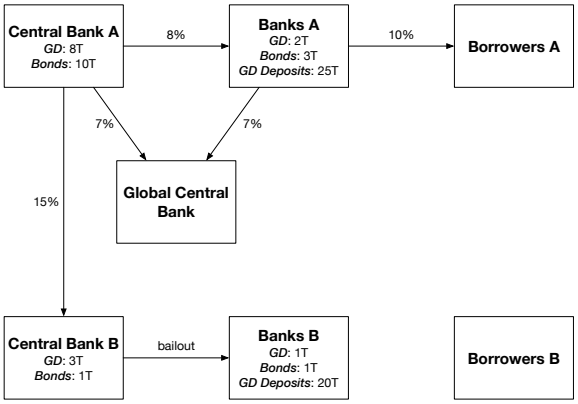

Figure 4: A liquidity crisis in B

agreement between the central banks is not secured, the GD banking system in B fails, but banks in A continue to function.

In fact, the crisis may well be resolved by the market before it occurs. Knowing that the central banks are likely to intervene, holders of GD bonds, including banks, will be incentivized to sell their bonds in secondary markets and acquire GD reserves ahead of time. This will raise bond yields, including the yields in the auction for new bonds issued via the bond rule. This could raise GD bond yields and help restore confidence in the banking system before any serious intervention by central banks is required.

4.4. Case study: a coalition of aligned central banks

Let us discuss the kinds of structures that might emerge in a world uses the GD as the global reserve currency and has many central banks. Because no single central bank has the ability to unilaterally influence the money supply, it is beneficial for coalitions of central banks to band together and create agreements to help facilitate coordinated action. Suppose the central banks of the countries of NATO form such a coalition to coordinate their actions. Assume that these countries together hold 60% of GD reserves and bonds. The members decide that they will make decisions using votes that are proportional to GD reserve holdings. They meet biannually to decide on their joint financial strategy.

Normal times

During normal times, the coalition requires that the ratio between reserves and deposits in their local economies should be at least 10%. They agree that each central bank will hold an equal number of GD and GD bonds on the reserve. The central banks of the coalition establish a common market for central banks to lend GD to each other and trade GD bonds.

Monetary policy

Each central bank may have its own monetary policy agenda, which it can implement by changing reserve ratios or interest rates in its local system as discussed in the examples above. During a

period of high inflation, the central banks decide to try to decrease the growth of the GD money supply by changing the composition of their reserve holdings so they hold 45% GD and 55% GD bonds on the reserve. This net purchase of bonds on the secondary market leads to a decrease in yields in the bond rule.

Liquidity crisis

A single country A experiences a liquidity crisis in the GD. The other members of the coalition negotiate an agreement to help by:

- Providing loans to A using government bonds and GD bonds as collateral.
- Buying GD bonds from A at above market prices.
- Deciding on austerity measures for banks in A.

Sanctions

In the current system, the US has sole power to deny countries access to the USD. In a world that has adopted the GD, such power does not disappear entirely, though it does get diluted. If the countries of NATO decide to place sanctions on country X, they can take the following actions:

- Stop all transfers of GD reserves between banks in NATO and institutions in X.
- Exclude institutions in X from interacting with secondary markets administered by NATO.
- Prevent institutions in X from using all banking infrastructure, like payment systems, that are controlled by NATO.

However, if NATO attempts to prevent X from taking part in the auctions of the bond rule, this would dismantle the credibility of the GCB and hurt the GD.

4.5. Case study: Great Financial Crisis (GFC) of 2008

Let us explore how the GFC might have played out in a world where the global financial system has adopted the GD but the US is by far the richest and most powerful country.

Recap of actual events [6, 7]

Triggered by U.S. subprime mortgage defaults in 2007, the crisis escalated with the collapse of major financial institutions, such as Lehman Brothers in September 2008. The Fed responded by slashing the federal funds rate from 5.25% in September 2007 to 0–0.25% by December 2008 and launching Quantitative Easing (QE) in November 2008, purchasing $600 billion in mortgage-backed securities and Treasuries to inject USD liquidity. The crisis spread globally as banks worldwide, holding U.S. mortgage-backed securities, faced losses, and interbank USD funding markets froze, disrupting credit flows.

Investors fled to safe-haven U.S. assets, particularly Treasuries, due to the USD's status as the global reserve currency, amplifying capital outflows from other regions. Global equity markets plummeted, losing $29 trillion in value in 2008, with developed markets like the Eurozone and Japan seeing declines of 40–50%. Emerging markets (EMs) faced severe capital outflows, with equity

markets losing $1.4 trillion and portfolio investments collapsing (e.g., India's net flows dropped from $17.3 billion in 2007 to -$13.2 billion in 2008). EM currencies depreciated sharply (e.g., Brazilian real fell 32%, Indian rupee 20% against USD), raising USD-denominated debt costs, while exports contracted (e.g., India's exports fell 33% in October 2008) due to trade finance shortages. Global trade collapsed by 10% in 2009, hitting export-driven economies like Germany and China. Commodity prices, such as oil, dropped from $147 to $34 per barrel, impacting exporters like Russia and Venezuela. The Fed's swap lines with 14 central banks, mainly in developed economies (e.g., ECB, Bank of Japan), provided USD liquidity, but most EMs (e.g., India, Brazil) were excluded, exacerbating liquidity crises. QE later drove capital surges in 2009–2010, sparking asset bubbles and currency appreciation worldwide (e.g., Brazil's real appreciated 35%, prompting capital controls). These events underscore the global contagion and EM vulnerabilities in a USD-centric system.

Alternate history

We consider a scenario where the Global Dollar (GD) is the global reserve currency, U.S. mortgages are still denominated in USD, and the Federal Reserve (Fed) holds 50% of all GD reserves and bonds. The crisis begins with USD-denominated subprime mortgage defaults in 2007, escalating with a major bank collapse in 2008. The Fed injects USD liquidity through Quantitative Easing and rate cuts, stabilizing U.S. banks. Banks worldwide face losses on their holdings of U.S. mortgaged-backed securities, and sell these instruments and buy GD bonds and reserves. These events lead to depreciation of the USD against the GD. To prevent further USD depreciation, the Fed begins to sell a large portion of its GD reserves to buy USD, flooding markets with GD reserves and bonds. Global investors rush to buy GD bonds, the standard safe-haven asset.

EM capital outflows do still occur as investors seek safety, but the flood of GD reserves and bonds sold by the Fed reduces the pressure on EMs. The Fed prioritizes US recovery, but benefits EMs indirectly by reducing their loss of capital. The Fed's USD injection and GD-to-USD conversions stabilize the US financial system. Fear of a GD liquidity crisis leads to rising GD bond yields, because investors value GD now instead of in the future. This leads to an uptick in the GD money supply. The flood of USD from the QE program leads to volatility in exchange rates for the USD, but has limited impact on the stability of other economies. The Fed's GD reserves are reduced, and all other countries have a net gain of GD reserves.

4.6. Case study: Asian Financial Crisis (AFC) of 1997

Let us explore how the AFC might have played out in a world where the GD is the reserve currency, and western countries hold most GD reserves.

Recap of actual events [6, 7]

In the mid-1990s, Asian "Tiger" economies—Thailand, Indonesia, South Korea, Malaysia, and the Philippines—pegged their currencies to the USD to draw foreign investment. These nations accumulated high USD debt—Thailand's hit $90 billion (50% of GDP)—to fund speculative local currency investments in real estate and corporate ventures, often with lax oversight. By 1997, these investments began to falter, with non-performing loans soaring. Thailand's reached 15% of bank assets.

As investments unraveled, the USD strengthened after the Federal Reserve raised interest rates to 5.5% in 1997 to control domestic U.S. inflation, increasing the local Asian currency cost of USD

debt repayment. Investor confidence collapsed, sparking capital flight. Central banks depleted USD reserves to defend pegs; Thailand's reserves fell from $38 billion to $1.1 billion by mid-1997. On July 2, 1997, Thailand abandoned the baht's peg, triggering a 40% devaluation. Contagion spread, with the Indonesian rupiah falling 80% and South Korea's won 30% as pegs collapsed.

Needing USD to stabilize currencies and service debts, affected nations sought aid. The IMF, backed by the G7, provided $118 billion in bailouts—$17.2 billion for Thailand, $43 billion for Indonesia, $57 billion for South Korea—with stringent austerity measures, including high interest rates (Indonesia's hit 70%) and budget cuts. These deepened recessions, with GDP contracting 10.5% in Thailand, 13.1% in Indonesia, and 6.9% in South Korea in 1998.

Alternate history

Imagine a world where the Global Dollar (GD) is the global reserve currency. Asian economies—Thailand, South Korea, Malaysia, and the Philippines—hold GD reserves and substantial GD-denominated debt, pegging their currencies to the GD to attract investment. They used this debt to fuel speculative local currency investments in real estate and corporate ventures. In 1997, as these investments falter, a crisis emerges, but the GD's decentralized system softens its impact.

As the crisis unfolds, investor confidence wanes due to rising non-performing loans, triggering a flight of GD reserves from Asian markets. Interest rates for lending to Asia in GD spike, reflecting heightened risk, which raises rates for all GD lending between central banks and pushes up GD bond yields. Asian central banks, exhausting their GD reserves, sell GD bonds on secondary markets to gain liquidity and demand GD loans from other countries to defend their pegs. This sparks a general bond sell-off, increasing yields in the bond auction mechanism and generating new GD liquidity system-wide. Though this fails to stop the crisis, the additional GD liquidity cushions the blow, enabling a softer landing. Pegs collapse, starting with Thailand's baht, followed by other regional currencies. The U.S. raises interest rates in 1997 to control domestic inflation, but this does not have a significant effect on GD lending, insulating Asian economies from U.S. monetary policy shocks. The IMF, backed by the G7, provides large GD loans to affected Asian nations, conditioned on austerity measures like high interest rates and budget cuts. G7 countries commit GD to these loans instead of buying bonds, prompting further bond sell-offs and raising GD bond yields, which generates additional GD liquidity. So, the bursting of Asia's credit bubble drives GD creation through the bond rule, even as the U.S. battles domestic inflation.

5. Comparison with the USD and other currencies

Let us compare the key features of the USD to the corresponding features of the GD. We start by discussing some key attributes of the USD that have helped to protect its entrenched position as the dominant global reserve currency for so many decades.

Advantages of the USD

1. **First-mover advantage**: The USD is the common language of international finance. Systems, protocols and regulations have been built around the USD over a period of many decades. The USD's dominance in global trade, especially in commodities like oil, creates a self-reinforcing cycle.

2. **Liquidity**: The USD is supported by robust mechanisms developed by the Fed to address liquidity crises and ensure stability. The infrastructure to deliver the USD wherever it is demanded is provided by an established network of international banks that are able to issue USD deposits (called Eurodollars) and trust each other's deposits.

3. **Safety**: Foreign holders of USD can invest in a deep and liquid market for US Treasuries, the defacto safe-haven asset. These assets preserve the value of reserves, yet can be efficiently and reliably sold to defend local currencies when needed. Countries around the world have used these safe assets to hold their rapidly expanding reserves. Although the US has recently shown it is willing to seize the reserves of countries it has conflicts with, the USD remains the safest available option for holding reserves.

4. **Transparency**: The USD is overseen by relatively independent and transparent institutions like the Federal Reserve. While these institutions prioritize US interests, they are perceived as insulated from short-term political pressures.

Lack of Alternatives

The **Euro** is the most likely challenger to the USD, but the Maastricht Treaty and the Stability and Growth Pact limit Eurozone countries' annual budget deficits to 3% of GDP and public debt to 60% of GDP [9]. These constraints prevent Eurozone countries from issuing sufficient government debt to provide safe assets like US Treasuries. There is not enough safe Eurozone debt available to absorb a significant fraction of the global reserves of the world: for example, $2.9T of German debt is available as compared to $36T of US debt.

Currencies backed by a fixed supply, like **gold or Bitcoin**, are incompatible with the banking system that runs global finance. Banks fund loans, which involve risk, using savers' deposits, which are guaranteed to be safe. The gap between risk and safety is managed by generating new money. A currency that does not allow for new money to emerge cannot use this advanced credit system to efficiently route money where it is needed. A system based on gold or Bitcoin for global trade will need to build an alternative banking system to provide credit.

The **Special Drawing Rights (SDRs)**, created by the International Monetary Fund (IMF) in 1969, and the proposed **BRICS Unit**, discussed at the 2023 and 2024 BRICS summits, represent centralized efforts to reduce reliance on the USD as the global reserve currency [8, 10]. SDRs are an IMF-managed reserve asset, valued by a basket of major currencies (USD, Euro, Yuan, Yen, Pound), allocated to member countries based on IMF quotas. SDRs are not tradable in private markets, restricting their use to central banks and select institutions, and cannot support a banking credit system, unlike the USD.

The BRICS Unit [10], proposed by Brazil, Russia, India, China, South Africa, and new members, envisions a currency pegged 40% to gold and 60% to BRICS currencies. The Unit's design relies on centralized coordination to set currency weights and manage the peg, a process complicated by divergent economic priorities. This centralization risks instability if consensus falters. Both SDRs and the Unit, tethered to centralized authorities (IMF or BRICS governments), lack the transparency and user-driven adaptability of the Global Dollar (GD), which decentralizes money supply through bond auctions.

USD vs GD

The primary advantage of the GD over the USD is that the money supply is decentralized. The primary advantage of the USD over the GD is the first-mover advantage. Assuming that the GD is adopted at scale, here is a comparison between the two on some other dimensions:

1. **Liquidity**: If adopted, the GD can simply use the same mechanisms for delivering liquidity currently used by the USD. Existing relationships between banks and existing infrastructure for issuing credit can easily be ported to the GD. Central banks and governments will have to come up with new protocols and regulations to prevent liquidity crises and conduct monetary policy, but there is no reason why the GD would not attain the same level of liquidity that is currently enjoyed by the USD.

2. **Safety**: Instead of holding US Treasuries as a safe-haven asset, central banks would hold GD bonds on the global reserve. Because the number of bonds is about the same as the number of GD on the reserve, there will always be a significant number of bonds available. These bonds are safer than US Treasuries, because they are not tied to the spending of any government, and the rules of the GCB guarantee that the bonds never default. In addition, the issuance of bonds follows predictable rules that ensure that new bonds will be available and every user has fair access to new bonds. For these reasons, the GD is safer.

3. **Transparency**: The rules for the GCB are so transparent that they can be implemented by an algorithm. This extreme transparency is a key advantage of the GD over the USD.

4. **Financial Contagion**: The world economy is entangled with the USD, and so mismanagement by financial institutions in the US has serious consequences for all countries. This was on display during the Great Financial Crisis. In a world where the GD is the dominant reserve currency, what happens in one country will surely affect another, but no country has a special role. If a single country has a liquidity crisis, that crisis has limited ability to spread to other countries. In fact, countries that have secure finances will be able to help the country that is in distress, for an appropriate price.

5. **Volatility**: The USD maintains a stable exchange rate with all the major currencies of the world. It is hard to predict how volatile the GD would be as a financial instrument if it was only partially adopted. A collection of central banks that commit to adopting the GD could put into place protocols that help to manage its initial volatility, as discussed below.

6. Strategies for Implementation

Adopting a new global reserve currency like the Global Dollar (GD) faces formidable barriers, including the USD's entrenched first-mover advantage and the challenges of coordination among diverse economies. This section explores four distinct routes for adoption: a US-led transition, a partial adoption that converts the Euro into a semi-decentralized currency, a coalition-driven effort by BRICS or similar groups, and an organic emergence through cryptocurrency. These strategies could compete or coexist, until one dominant solution emerges. Each requires further research to assess feasibility and refine execution, but here we provide brief sketches.

1. **Led by the US**: The US benefits enormously from the use of the USD as the global reserve currency, but this status has drawbacks. Foreign countries demand USD reserves, creating

trade imbalances. Tariffs on US exports are attractive because a trade surplus with the US gives countries access to more USD. In essence, the USD acts as a major US export, competing with other exports.

To align US interests with a transition to the GD, the following steps could be considered:

(a) The US agrees to support the transition to the GD, and creates the GCB.

(b) The Fed agrees to redeem each GD for a USD during a defined transition period. This ensures that the GD immediately has value. All financial systems that use the USD and Eurodollars are adapted to use the GD during this transition period.

(c) US government debt to foreign nations is restructured: all US Treasuries and USD currently held in foreign government reserves are replaced by GD bonds and GD on the new global reserve. This compensates the US and strengthens the Global Dollar.

(d) The Fed's account at the new global reserve is initialized with a significant allocation of bonds and GD, incentivizing US commitment and ensuring US influence within the GD system.

The US sacrifices the USD's reserve status but gains debt relief and reduced pressure on US exports. Foreign nations gain a decentralized reserve currency, reducing their need to hoard USD and mitigating market distortions.

2. **A partial decentralization of the Euro**: As discussed in Section 5, the Euro is the most likely challenger to the USD, but its limited supply of safe-haven assets constrains its global reserve potential. The European Central Bank (ECB) could address this by adopting a GD-inspired mechanism, creating a semi-decentralized Euro:

   (a) The ECB implements the GCB's bond auction protocol to manage a global reserve of Euros and Euro bonds, analogous to GD bonds. Only Eurozone central banks are permitted to participate in bond auctions, preserving Eurozone dominance over Euro monetary policy.

   (b) The system is initialized with zero Euro bonds, prompting rapid issuance until Euro bonds constitute roughly 50% of the reserve, as per the bond rule.

   (c) Secondary markets, open to all, trade Euro bonds, enhancing liquidity and global access.

   (d) The ECB maintains control of the Euro, although foreign markets do gain an influence. The ECB conducts monetary policy by negotiating agreements among Eurozone members to coordinate bond trading. During crises, the ECB could temporarily restrict non-Eurozone access to liquidity by controlling Eurozone nations' Euro bond trading on secondary markets and coordinating their bidding in the bond rule, prioritizing regional stability.

   (e) Foreign governments and institutions hold Euro bonds as a reserve asset.

   This approach equips the Euro with a scalable safe-haven asset (Euro bonds) without increasing Eurozone sovereign debt, strengthening its competitiveness as a reserve currency. The definition of the mechanism ensures that the number of Euro bonds will always we about the same as the number of Euros in reserve, so if adoption of the Euro increases, the number of bonds available will grow as well. This strategy appeals to Eurozone countries seeking greater global financial influence without relinquishing fiscal discipline or regional autonomy.

3. **Led by BRICS or similar coalition of countries**: The BRICS coalition (Brazil, Russia, India, China, South Africa, and new members) has sought alternatives to the USD to reduce exposure to US monetary policy and sanctions. A GD-based approach could align with their goals:
   (a) BRICS countries establish the GCB and commit to adopting the GD as a reserve currency.
   (b) During a transition period, BRICS central banks redeem each GD for a basket of their currencies, anchoring the GD's value and encouraging early adoption.
   (c) All trade among BRICS countries is conducted in GD, creating a critical mass of transactions to build network effects.
   (d) After the transition, the GD floats freely, its value determined by market dynamics and reserve demand.
4. **Organically using a Cryptocurrency**: Bitcoin has shown that it is possible for an organically emergent cryptocurrency to acquire value [3]. A similar chain of events could allow the GD to emerge.
   (a) A carefully designed cryptocurrency that implements the GCB is released.
   (b) Users adopt the GD and trade bonds on the global reserve, driven by speculation that the GD will become a global standard.
   (c) Unlike Bitcoin, the GD's design incentivizes spending over hoarding, reducing volatility over time. Without central bank backing, initial volatility may be high.
   (d) The GD gains traction in global transactions, particularly in regions with unstable currencies or limited access to USD.
   (e) Banks begin holding GD bonds and reserves, issuing GD-denominated deposits and loans. Central banks join to mitigate liquidity risks, formalizing the GD's role.

   This strategy relies on grassroots adoption and market-driven growth, bypassing the need for immediate state support. It faces challenges in achieving scale and regulatory acceptance but could thrive in a digital economy seeking decentralized alternatives.

7. Conclusions

This paper proposes the Global Dollar (GD), a global reserve currency with a decentralized money supply managed through user-driven bond auctions. By enabling all users to participate equally in money creation, the GD ensures fairness and resilience, distinguishing it from centralized currencies like the USD. It provides a safe-haven asset, GD bonds, that are not tied to the deficits or spending of any government. Its design allows seamless integration with existing banking systems, making it a practical alternative for global trade. If adopted, the GD could enhance financial stability by reducing reliance on any single nation's monetary policy, mitigating the risk of global contagion from localized crises.

Future research should explore auction implementation, strategies for adoption and partial implementations. The GD represents a bold step toward a decentralized financial future, with the potential to reshape global economics if stakeholders embrace its vision.

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