The Implications of Digital Currencies for Monetary Policy and the International Monetary System

Charles Engel
University of Wisconsin - Madison
Cryptocurrencies and Monetary Policy

• Private cryptocurrencies
  • Might be analogous to currency substitution regimes
  • Cryptocurrencies usually need to be converted into government-issued currencies to be spent. Even when they are accepted directly, prices of goods and services are rarely denominated in cryptocurrency

• Central bank cryptocurrencies
  • Retail central bank cryptocurrencies
  • Analogous to “reserves for all” or CBDC
Features of private cryptocurrencies

- **Anonymity**
  - A desirable feature for libertarians and those trying to evade the law, but not a feature desired by governments.
  - But with the special feature that they are like “souped up” $100 bills

- **“Monetary policy”**
  - For example, a fixed supply of Bitcoin (subject to change?)
  - Analogous to gold standard, perhaps

- **Private information**
  - There is largely little private information about these assets
Features of central bank cryptocurrencies

• Very similar to deposit accounts offered by central banks

• Deposit accounts versus cryptocurrencies
  • Anonymity? Unlikely that central bank cryptocurrencies would feature anonymity.

• Monetary Policy Rule

• Private information
  • There is largely little private information about these assets
  • There may be asymmetric information about monetary policy
What I will not discuss

- Blockchain, distributed ledger, etc., etc.
  - May be important, but not my comparative advantage

- Determination of cryptocurrency exchange rates

- Many, many other aspects of cryptocurrencies and policy
  - Financial Regulation
  - Bank profitability and implications for banking system
  - Implications for payments system efficiencies and risks

- I consider “aspects” of monetary policy, but do not offer a comprehensive or systematic analysis.
I will take cryptocurrencies seriously

- Many economists are skeptical and consider cryptocurrencies to be a fad.
- They may be right. But I will consider policy implications conditional on cryptocurrencies becoming viable and successful.
- It seems possible that many of the technical difficulties present in Bitcoin, for example, may be overcome in the future – but maybe not!
Anonymity of private cryptocurrencies

• To some, anonymity is an appealing feature

• Anonymity, at this point, does not seem total. Some clever law enforcement officials have used tools to break it.

• But it is fair to say that it presents a challenge to regulation.

• My specific focus is that cryptocurrencies make it much easier to evade capital flow management policies.
Is that a bad thing?

• The “traditional” view of economists (and the IMF) was that it is desirable to allow capital to flow freely.

• Capital controls were considered undesirable because:
  • They prevent capital from flowing to its most productive use.
  • They hamper diversification
  • Capital flow regulations are costly and difficult to enforce
  • They promote corruption

• Nonetheless, there has been a revival of interest in this tool.
Why capital flow management?

• Long-run considerations to regulate capital outflows:
  • Stifle “hiding” of ill-gotten gains and tax evasion
  • Externalities of investment: private returns < social returns

• “Overborrowing” in the sense of Bianchi (2011)
  • Individual borrowers don’t take into account fire-sale externalities

• Macroprudential policy
  • Regulation of local financial institutions is insufficient.
  • Regulation of foreign financial institutions is not possible
Hot capital flows

• Maturity mismatch – foreign lending is short-term, to finance long-term projects
  • Rollover risk
  • Why is lending short term? May reflect political risk.

• Currency mismatch
  • As Maggiori, et al. (2018) has shown, foreign debt is almost always in currency of lender.
  • Currency mismatch presents special risks for emerging markets.
Exchange rate management

• Trilemma – not possible to manage exchange rate and domestic policy objectives with perfectly free capital mobility

• Capital account restrictions make sterilized intervention possible.

• Exchange rate changes, whether driven by irrational bubbles or by rational investors taking into account news and risk aversion, may lead to misalignments
  • Prices and wages do not move flexibly
What misalignments?

- Terms of trade
- Relative price of traded goods to nontraded goods
- Inefficient pricing to market
- Trade balance misalignments
  - For example, persistent deficits may lead to unsustainable foreign debt.
Can cryptocurrencies be regulated?

- It may be very hard to regulate the flow of capital through private cryptocurrencies.
  - Anonymity and bypassing of the financial system
- China’s “ban” on trading and VPNs
- Perhaps regulation can hamper spending cryptocurrencies
  - But one could imagine giant Bitcoin malls opening in the Grand Cayman Islands, where people come to spend their cryptocurrencies
Why do we need cryptocurrencies?

• Anonymity – though the contribution to social welfare is questionable.
  • Marvin Goodfriend and Rand Paul

• Monetary policy effectiveness
  • Central banks have done a good job of maintaining a stable purchasing power of their currencies.
  • Gold standard did not.
  • I will return to this question later when considering central bank cryptocurrencies.
U.S. Inflation, 1871-2018
U.K. Inflation since 1200
Private information

• Gorton has defined a “safe asset” as an asset about which an investor can be confident that no other investor has private information.

• That describes cryptocurrencies in the ideal

• It also describes regular currencies (subject to caveat discussed later.)
  • What challenges does the presence of private cryptocurrencies pose for monetary policy?
Currency substitution

• There is an old economics literature on “currency substitution” that is relevant here.

• The key point to note is that currency substitution is possible already, but it is rare.

• Only countries with very high inflation rates have experienced currency substitution.

• Of course, investors can freely diversify investments in different currencies, and may find some hedging gains to diversifying the currency composition of the portfolio.
Currency substitution in practice

• The key characteristic of countries experiencing currency substitution is that transactions are denominated in two different currencies.

• The host country cannot influence the inflation rate of the guest currency.

• The effectiveness of countercyclical monetary policy is weakened to the extent that transactions take place in the guest currency.

• But this is a cumbersome system, which is why it is rare.
Practical implications

• Private currencies are unlikely to replace government currencies for well-managed economies

• Even a significant dual-currency regime is implausible
  • It is cumbersome to have a dual system of pricing
  • If prices are set in local currency, then circulation of a private currency does not pose more problems than the presence of 180 government-issued currencies.
Practical implications

• Can cryptocurrencies find a policy that does a better job maintaining real value of currency than central banks?

• One possible implication is that monetary policymakers will adopt more discipline in order to prevent currency substitution.
  • However, this is analogous to dollarization in hyperinflation countries. Clearly the threat of loss of seignorage is not always effective.

• The threat from cryptocurrencies may be somewhat greater since it is harder to regulate their use compared to dollars.
Central bank crypto currencies

- The concept is very similar to central banks offering deposit accounts – so-called “reserves for all”
- One possible distinction is that central bank cryptocurrencies could still maintain the anonymity feature.
  - But it is unlikely this is a feature that central banks would want.
- In contrast to private cryptocurrencies, the value of the central bank variety is controlled by monetary policy makers.
Liquid asset

- Safe asset in the Gorton sense – no private information about the value.
- Default risk is low
- Maintains real value
- Easy and safe to use and store
Central bank deposits versus other assets

• Central bank deposits are easier to spend than Treasury bills.
  • Less default risk if there is monetary policy independence

• Central bank deposits are easier to store and safer than cash

• Central bank deposits are less liable to asymmetric information than insured checking deposits
  • That is because there is a limit on insurance
  • In turn, the limit exists because of moral hazard issues

• However, the central bank controls the real value of the central bank deposits
Analogy to denomination of sovereign debt

• No private investor has private information about monetary policy (usually!)
• But the monetary policy maker cannot commit to maintaining the real value of central bank deposits.
• It might be tempted to abuse its seignorage privilege.
• Why can some countries borrow in debt denominated in their own currency?
  • A partial answer is commitment to inflation targeting
Share of External Sovereign Debt in Local Currency
Inflation targeting

• Those governments that have been able to issue debt in their own currencies have stabilized inflation

• The general lesson is that inflation targeting is a successful policy. Countries that have stabilized inflation face no real danger of having their currencies replaced by cryptocurrencies.

• Since nobody sets prices in units of cryptocurrencies, there is no sense in which these are “stable.” The “stable” cryptos are simply ones that stabilize in terms of a central bank currency!
How is bank profitability affected?

- If monetary policy is credible, I assume central bank deposits are more desirable than commercial bank deposits.
- Does this erode bank profits? Banks would protest, for sure.
- One should not mistake the partial equilibrium view of a single bank for the general equilibrium outcome.
- By the way, CBDCs are much less of a problem for traditional banking models than Fintech and Big Tech.
- Commercial banks may still have a role for maturity transformation.
Equilibrium effects

• Assume on the asset side, central bank holds government bonds and foreign reserves.

• Funding becomes more expensive for commercial banks

• Will increase cost of funds, so increase lending rates, discourage investment

• In essence, country adjusts portfolio toward more liquid assets and less capital.

• International capital flows modify this
Alternative central bank model

• One suggestion in the literature is that the central bank provide funding to commercial banks
• This strikes me as very much like a system with unlimited deposit insurance
• In such a scheme, the regulators would need to be very vigilant about moral hazard and adverse selection
Safe asset supplied by a non-U.S. country?

• The literature has made much of the “exorbitant privilege” of the U.S.
  • Its government assets are valued as safe, liquid assets and so can pay a lower return.

• Does the market even value government assets from any other country for their liquidity?

• We can test this by asking whether the country’s currency value responds to the convenience yield of the government assets
In work with Steve Pak Yeung Wu, we consider a modification to “standard” models of exchange rates.

We include traditional determinants: interest rates and an error-correction term.

But we also consider the so-called “convenience” yield of a country’s Treasury assets: the difference between its government bond yields and the interest rate on a “safe” interbank loan.

The larger the difference (the smaller the relative return on government bonds), the stronger is the currency.
US Dollar relative to 9-country panel

Regression:
\[ \Delta s_t = \alpha_t + \beta_1 s_{t-1} + \beta_2 \Delta \text{basis}_t + \beta_3 \Delta (\text{foreign yield-home yield})_t + \beta_4 \text{basis}_{t-1} + \beta_5 (\text{foreign yield-home yield})_{t-1} + \epsilon_t \]

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<td>(0.0061)</td>
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<td>( \Delta \text{basis}_t )</td>
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<td>(0.4824)</td>
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<td>( \Delta (\text{foreign yield - home yield})_t )</td>
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<td>(0.2745)</td>
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Standard errors in parentheses

* p<0.1, ** p<0.05, *** p<0.01
### Table for all countries 1988M1-2018M1

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| $\Delta basis_t$  |     |     |     |     |     |     |      |     |     |
|                   | +   | +   | +   | +   | +   | +   |      | +   | +   |

| $\Delta \left( foreign \ yield \right)_t$ |     |     |     |     |     |     |      |     |     |
|                                              | *** | *** | *** | *** | *** | *** |      | *** | *** |

| $\Delta \left( -home \ yield \right)_t$    |     |     |     |     |     |     |      |     |     |
|                                              | *** | *** | *** | *** | *** | *** |      | *** | *** |

**Period**

1988M1-2018M1

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Period: 2008M1-2018M1

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Implications (speculative)

• If countries are able to issue more safe assets, the exorbitant privilege of the U.S. will be diminished.

• The dominance of U.S. Treasuries as safe assets may be tied to the dominance of the U.S. dollar in invoicing and in denomination of loans.

• Greater holdings of safe assets in local currency may encourage more lending in local currency, so exchange rate risks are balanced.

• In turn, less corporate debt in dollars mitigates the need to invoice in dollars to hedge exchange-rate risk for exporters.
Less dollar dominance

• To the extent that trade is denominated in local-currency, the pass-through of exchange rates to inflation is diminished.

• Perhaps a greater issue is the fragility of the financial system when corporate debt is denominated in dollars.
  • Financial accelerator effect from currency depreciation

• An early mover in the establishment of a CBDC may establish a regional dominance if it attracts not only local but regional investors
  • Network effects tend to entrench the leadership of early movers.
How much can policymakers prepare?

- The immediate “threat” to monetary policy and the international financial system seems small (except for evasion of capital controls.)

- The challenges for the future depend completely on how the role of cryptocurrencies evolves:
  - Widespread use in transactions?
  - Held as reserves?
  - Supplant weak national currencies?