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

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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

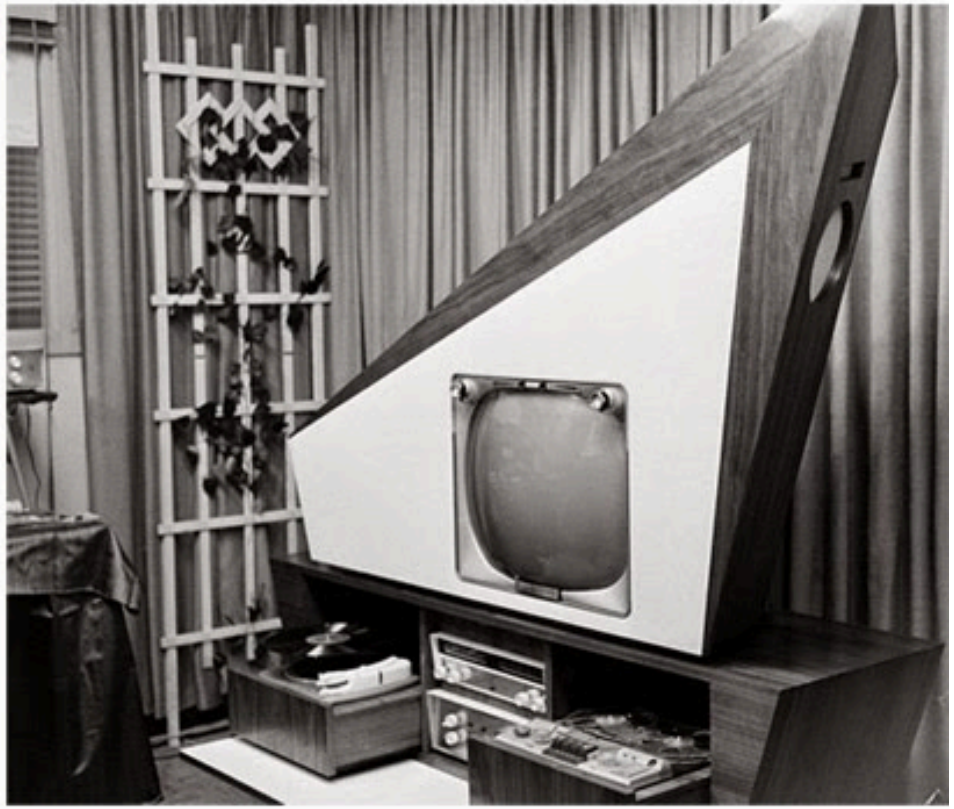
- Very similar to deposit accounts offered by central banks
- Deposit accounts versus cryptocurrencies
  - Anonymity? Unlikely that central bank cryptocurrencies would feature anonymity.
- Monetary Policy Rule
- Private information
  - There is largely little private information about these assets
  - 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?

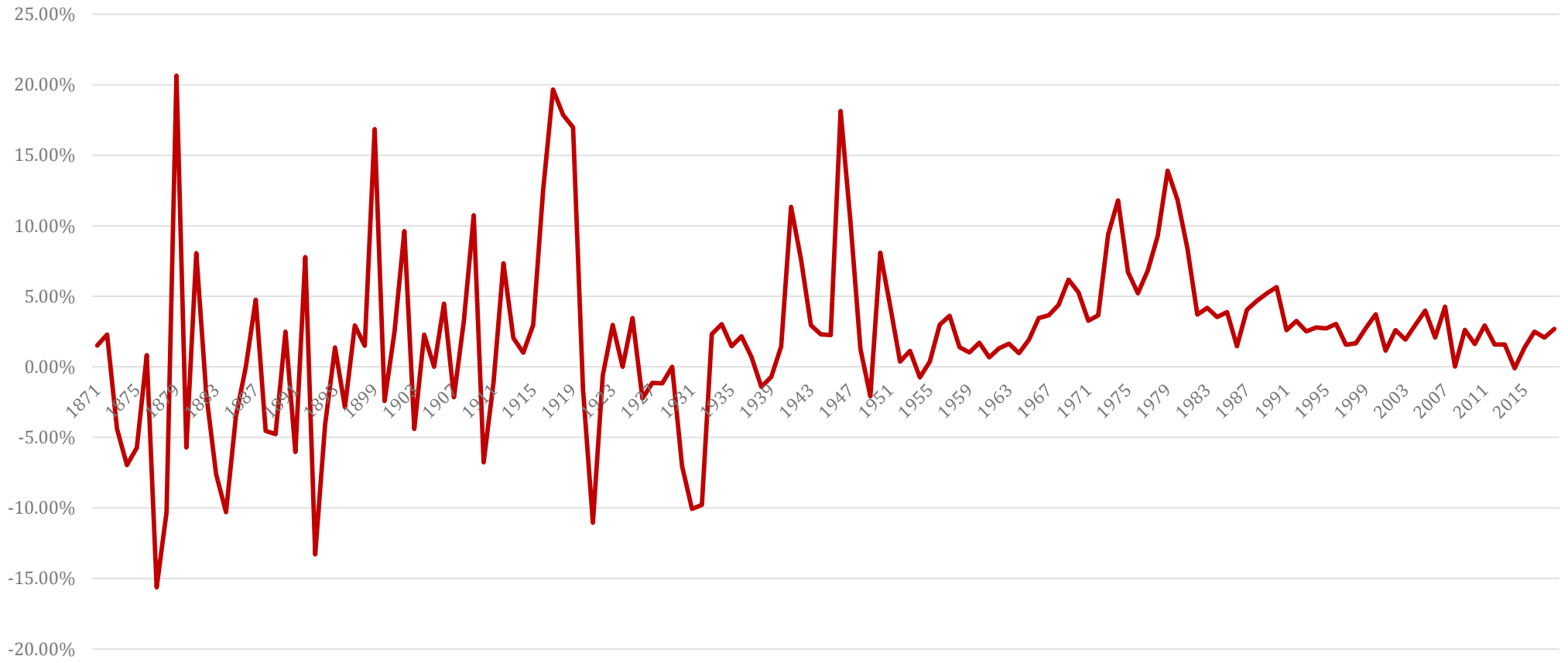
- It may be very hard to regulate the flow of capital through private cryptocurrencies.
  - Anonymity and bypassing of the financial system
- China's "ban" on trading and VPNs
- Perhaps regulation can hamper spending cryptocurrencies
  - But one could imagine giant Bitcoin malls opening in the Grand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


bitcoin
ATM
bitcoin

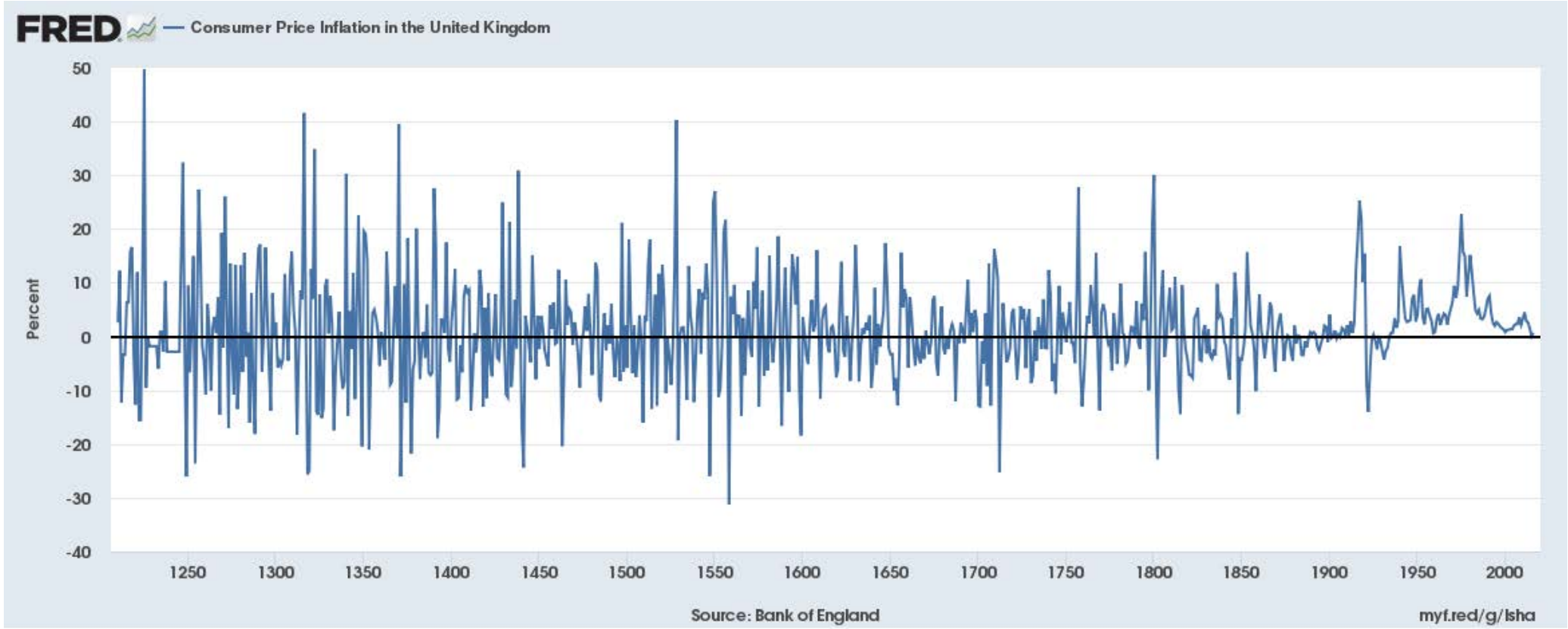
Why do we need cryptocurrencies?

- 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.


100 000 000 000 000 RESERVE BANK OF ZIMBABWE
100 000 000 000 000
I promise to pay
the bearer on demand
AA1701201
ONE HUNDRED
TRILLION
DOLLARS
for the Reserve Bank of Zimbabwe
Dr. G. Gono
Governor
100 000 000 000 000 HARARE 2008
AA1701201
100 000 000 000 000 RESERVE BANK OF ZIMBABWE
100 000 000 000 000

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

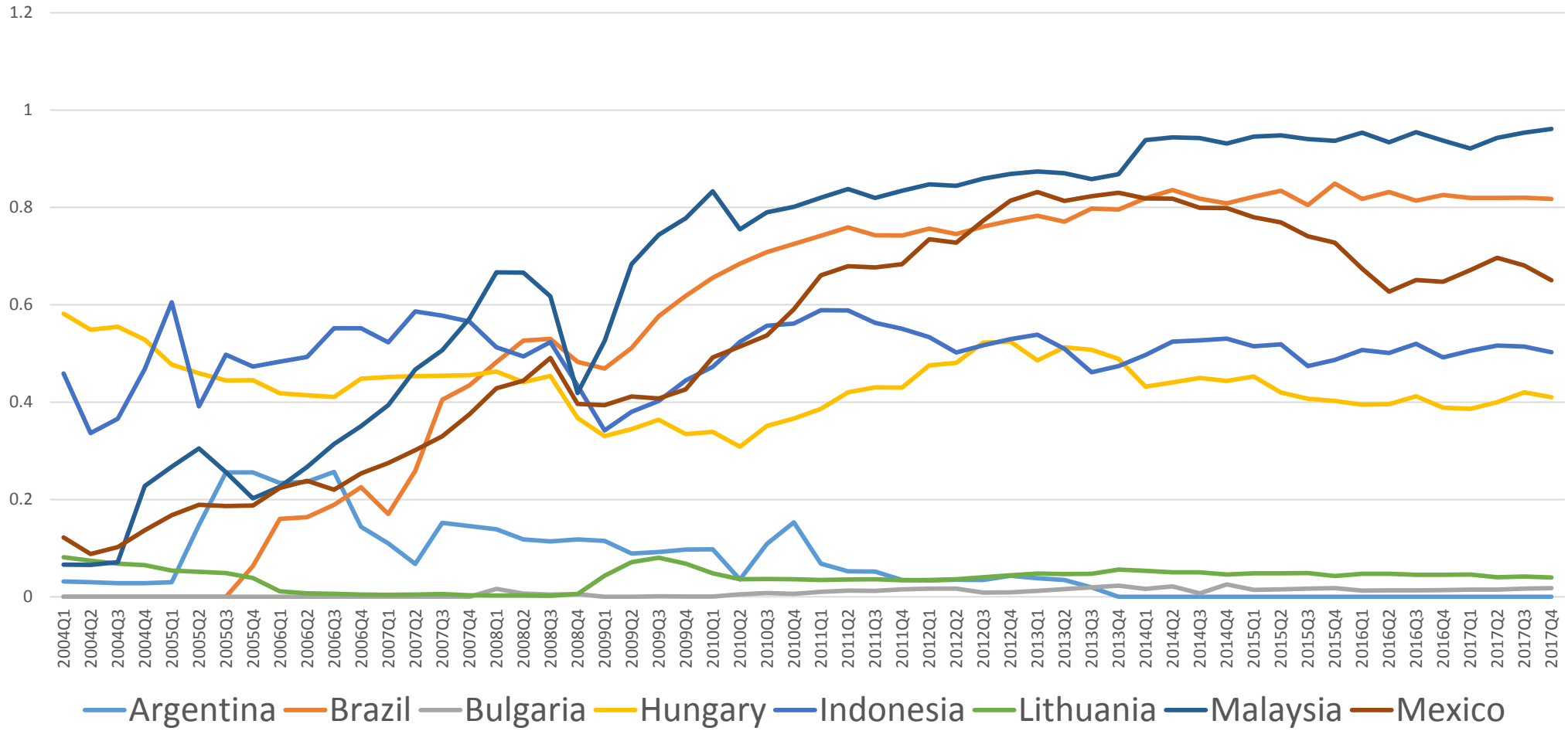
Central bank deposits versus other assets

- 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



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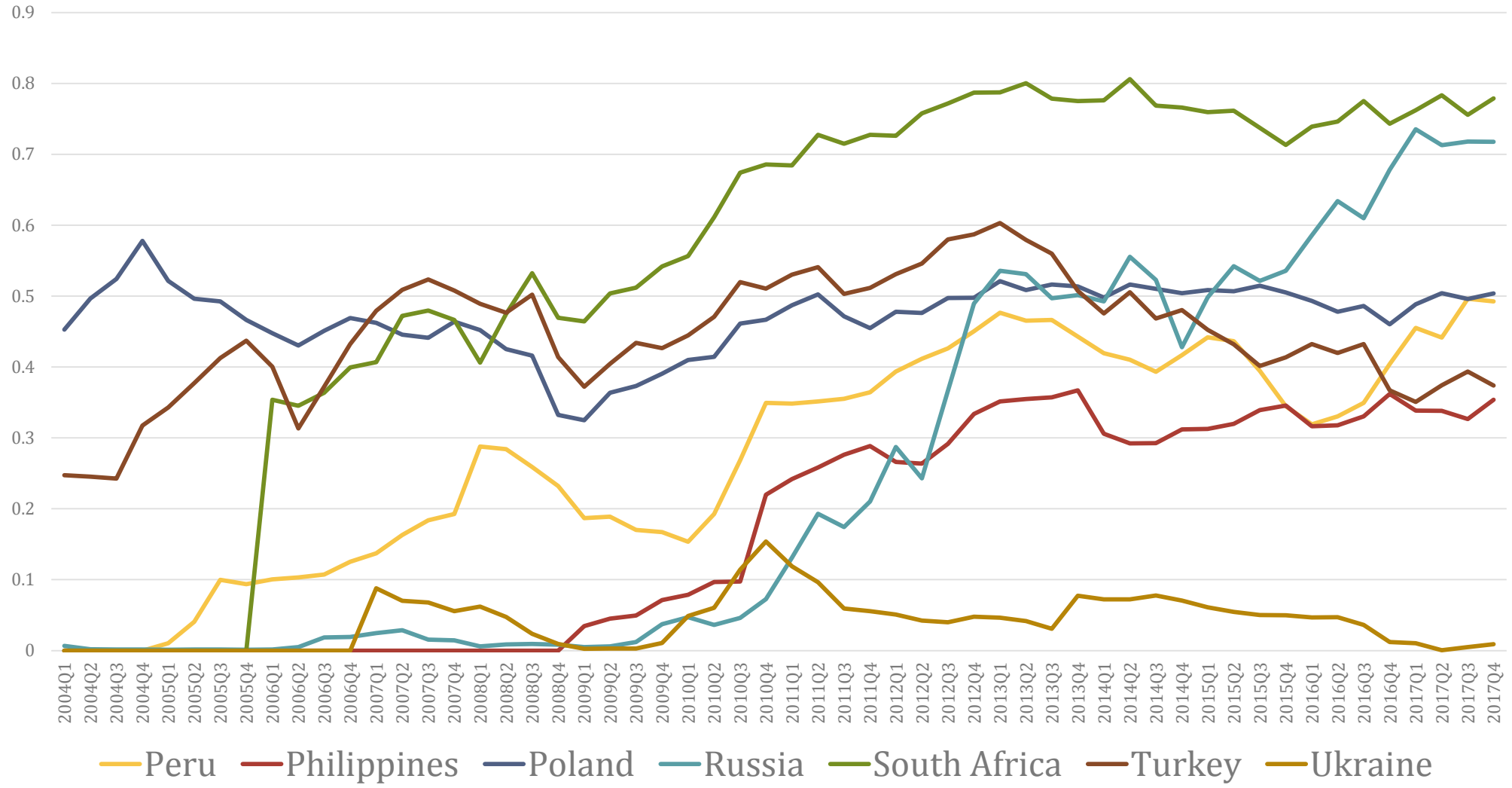

Inflation targeting

- 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 crytpocurrencies, 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

Exchange rate determination

- 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:

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

LHS:Δs_t	USD	USD
s_{t-1}	-0.0223***	-0.0924***
	(0.0061)	(0.0218)
$\Delta basis_t$	4.9372***	11.0358***
	(0.4824)	(1.0995)
$\Delta(forign\ yield\ -home\ yield)_t$	-5.3315***	-10.2294***
	(0.2745)	(0.5382)
Period	1988M1-2018M1	2008M-2018M1

Standard errors in parentheses

* p<0.1, ** p<0.05, *** p<0.01

Table for all countries 1988M1-2018M1

LHS:Δs_t	AUD	CAD	DEM	JPY	NZD	NOK	SEK	CHF	GBP
s_{t-1}	- ***	- ***	- ***	- ***	- ***	- ***	- ***	- ***	- ***
$\Delta basis_t$	+ ***	+ *	+ ***	+ ***	+ ***	+ ***	+ ***	+ ***	+ ***
$\Delta\begin{pmatrix} forign\ yield \\ -home\ yield \end{pmatrix}_t$	- ***	- ***	- ***	- ***	+ ***	- ***	- ***	- ***	- ***
Period	1988M1-2018M1								

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Table for all countries 2008M1-2018M1

LHS:Δs_t	AUD	CAD	DEM	JPY	NZD	NOK	SEK	CHF	GBP
s_{t-1}	- ***	- ***	- ***	- ***	- ***	- ***	- ***	- **	- ***
$\Delta basis_t$	+ ***	+ ***	+ ***	+ ***	+ ***	+ ***	+ ***	+ ***	+ ***
$\Delta \begin{pmatrix} forign\ yield \\ -home\ yield \end{pmatrix}_t$	- ***	- ***	- ***	- ***	+ ***	- ***	- ***	- ***	- ***
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?


MAIN STREET


LIBERTY
AMMUNITION
CIVIL
DEFENSE
9mm +P
50gr 2000 fps