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Non-Uniform Currencies and Exchange Rate Chaos

James Bullard
President and CEO

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Any opinions expressed here are my own and do not necessarily reflect those of the Federal Open Market Committee.

Introduction

Technological innovation and growth

- I am a fan of technological innovation as a driver of economic growth.
- I think blockchain technologies and their current and potential applications, including cryptocurrencies, are promising.
- However, I will discuss cryptocurrencies from the narrower viewpoint of currency provision.

Some published monetary theory

- I am a policymaker, but I am also a research economist who has contributed to the literature on "private money."*
- I will give some of my views based selectively on this literature along with other observations.
- The exact results from this math-econ literature are model-dependent and so require some interpretation to be understood in a policymaking context.

** C. Azariadis, J. Bullard and B.D. Smith, "Private and Public Circulating Liabilities,"* Journal of Economic Theory, *July 2001, 99(1-2), 59-116; J. Bullard and B.D. Smith, "The value of inside and outside money,"* Journal of Monetary Economics, *March 2003, 50(2), 389-417.*

Key themes in this talk

- The literature suggests that public and private currencies can co-exist as part of an equilibrium.
- Cryptocurrencies are creating drift toward a non-uniform currency in the U.S., a state of affairs that has existed historically but was disliked and eventually replaced.

More key themes in this talk

- The international monetary system features non-uniform currency arrangements, but the volatile exchange rates that characterize the system have long been criticized.
- Conclusion:
  - Cryptocurrencies may unwittingly be pushing in the wrong direction in trying to solve an important social problem, which is how best to facilitate market-based exchange.

Global Currency Competition

Currency

- For my purposes, currency is an intrinsically worthless object that has value in equilibrium only because others are expected to accept it in exchange.
- In the theories I work with, there is always an equilibrium where no one chooses to hold the currency, and its value falls to zero.

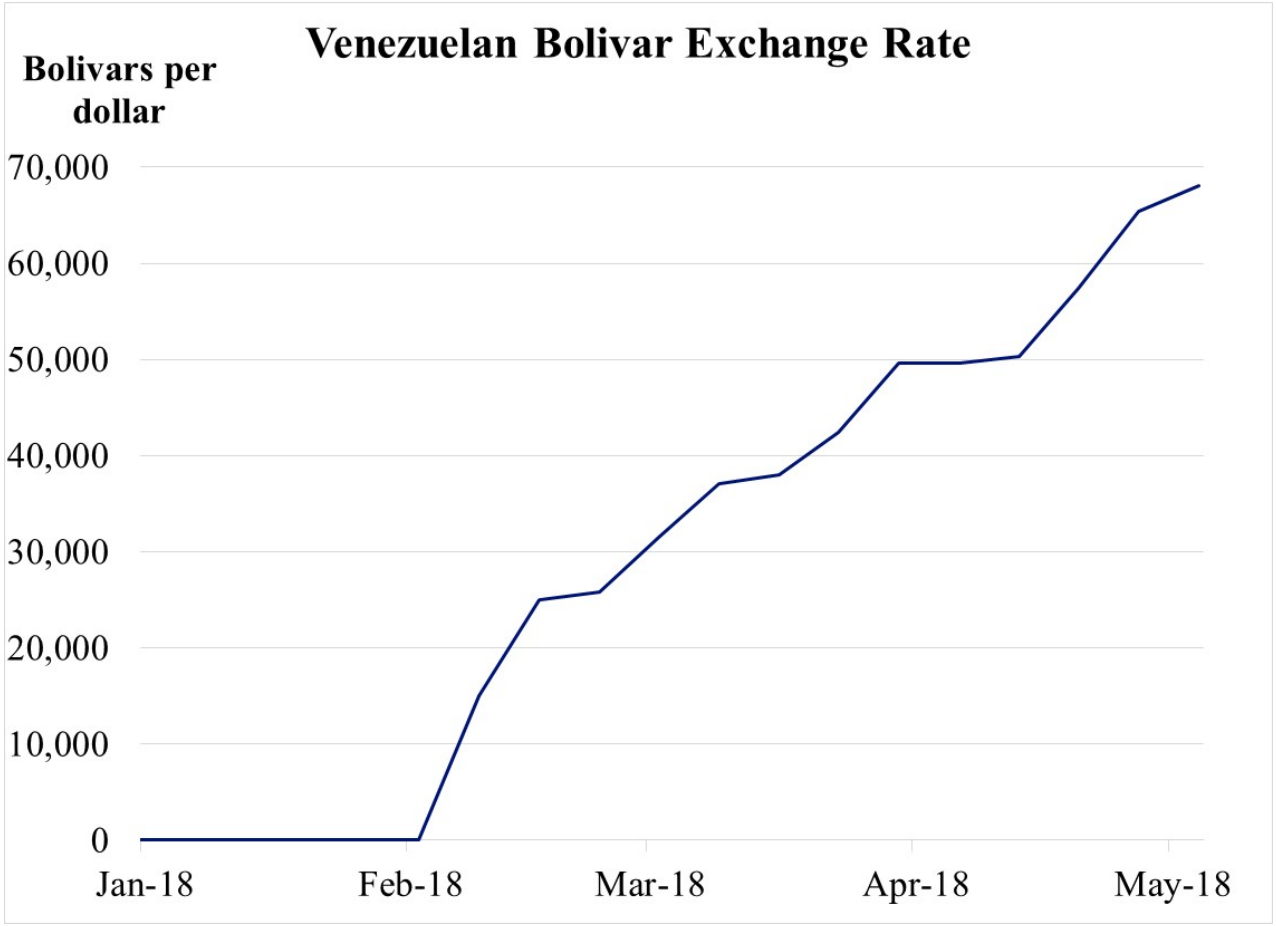
Currency competition

- Currency competition is nothing new, nor is electronic delivery of value.
- Many currencies are government-issued and backed by the monetary policy of the issuing government.
- There are also micro-currencies of many types.
  - Famously, cigarettes became a currency among POWs during WWII.

Currency competition in action

- The first chart plots the number of Venezuelan bolivars required to purchase one U.S. dollar during 2018.
- U.S. monetary policy is relatively stable, while Venezuelan policy has been unstable, leading the bolivar to devalue against the dollar.
- Bolivar holders were harmed relative to dollar holders during this period due to unstable Venezuelan policy.
- Could cryptocurrencies protect us against the vagaries of Venezuelan-style monetary policy?

Venezuelan bolivar devaluation



Sources: Federal Reserve Board and author's calculations. Last observation: Week of May 4, 2018.

Privately Issued Currency Enters the Currency Competition

Privately issued currency

- Privately issued currency can fit into this context of many competing currencies.
- One of the interesting results from the literature is the existence of a steady state in which both publicly and privately issued currencies circulate as exchange media.
- The key point is that, at least in an equilibrium like this, one type of money need not crowd out the other. Both are required to allow all voluntary trade to occur.
- What is happening? It is simple: The private currency facilitates exchange that would not otherwise occur.

Are more transactions better?

- In an abstract model, more transactions are a good thing. Voluntary exchange should be encouraged and not inhibited.
- In the real world, some of these now-enabled transactions may be illegal or quasi-legal.
- Some examples include illegal drug trades or simple avoidance of other types of rules, such as Chinese capital controls.
- This issue has been widely debated, so I will not comment on it further here.

Lots of Privately Issued Currency

Few limits on issuance

- Another prediction from the theory is that many private currencies would be issued.
- In the literature, every person who wants to issue a private currency could do so and would do so as part of the equilibrium.
- If we turn to the real world today, something like this appears to be happening.
- According to Investing.com's current list, more than 1,800 cryptocurrencies have been launched.

Non-uniform currency then

- Historically, the profusion of privately issued currency created an unsatisfactory system.
- In the 1830s, 90 percent of the U.S. money supply was privately issued banknotes.*
- Contemporaries did not like this system. Currencies traded at different rates at different times and places. There were discount books in each town to keep track of how much each currency should be discounted. There was a call for a "uniform currency," which was implemented during the Civil War.

* *See P. Temin,* The Jacksonian Economy*, Norton, 1969.*

Non-uniform currency now

- Is something like this happening today?
- It certainly appears to be.
- There are lots of privately issued cryptocurrencies, trading at various rates minute by minute.
- The only reason this is not a bigger issue today is that the total volume of cryptocurrency trade is not that large in relation to the entire economy.

The drift toward non-uniformity

- The current situation could be described as a drift toward a non-uniform currency in the U.S.
- One suspects that consumers and businesses will not like a non-uniform currency in which many types of currency trade simultaneously at a variety of prices in a local market.
- Currencies have to be reliable and hold their value. This is probably why government backing has been important historically, combined with a stable monetary policy that promotes stability of the currency.
- The Venezuelan example fails the second part of this test.

The Vagaries of Monetary Policy Remain

The vagaries of monetary policy

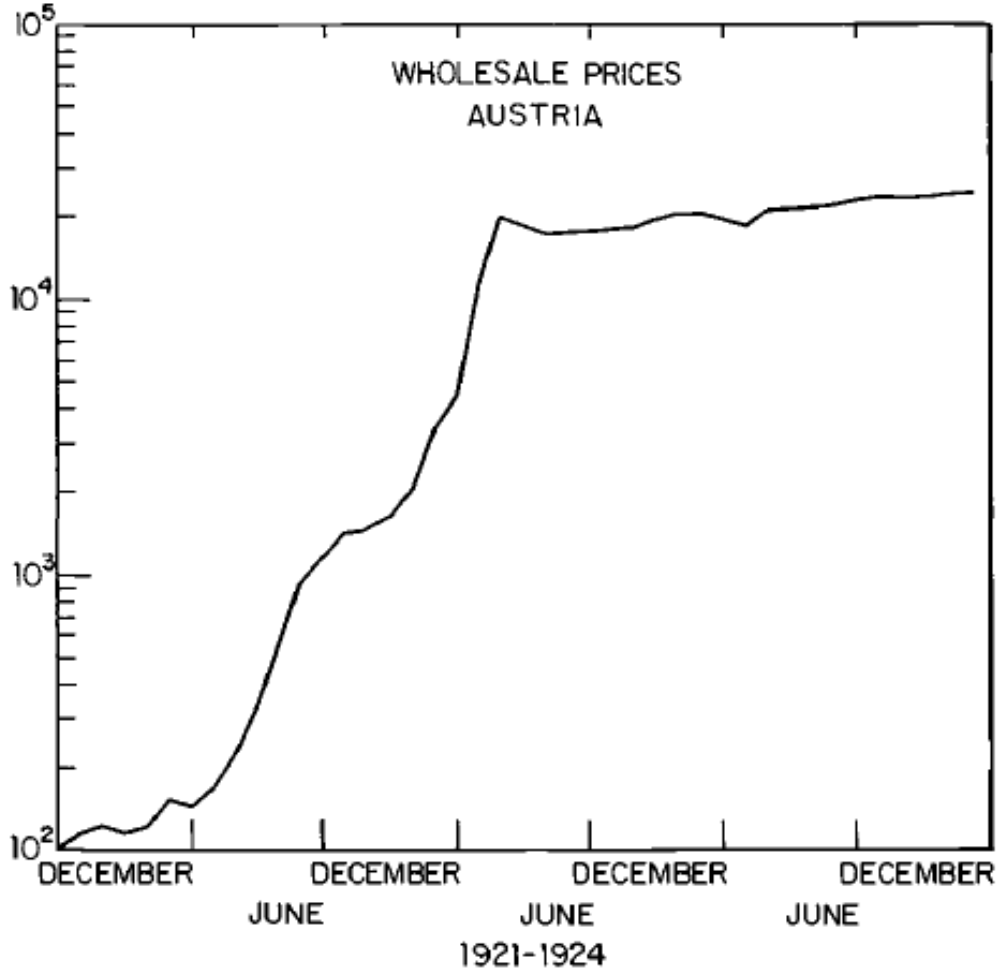
- The problem of how to stabilize currency value is not mitigated by commodity-backed money or cryptocurrency.
  - Under a gold standard, the government had to name the exchange rate between notes and gold, and governments sometimes altered this rate.
  - With cryptocurrencies, there is a monetary policy encoded in the system, perhaps a fixed volume of "coins." But the system can also bifurcate, creating two fixed volumes of coins—a process that can happen multiple times.
- The core question remains: How credible are promises for limits on future issuance?

The credibility of future policy

- One of the main lessons of monetary theory is that the credibility of future issuance policy is a key aspect to the value of a currency.
- An important illustration of this is Thomas J. Sargent's famous paper, "The Ends of Four Big Inflations."*
- Sargent reviewed hyperinflations in four countries following WWI and found that they all ended with credible commitments to future policy.

** T.J. Sargent, "The Ends of Four Big Inflations," in* Inflation: Causes and Effects*, R.E. Hall, ed., University of Chicago Press, 1982.*

The end of hyperinflation in Austria



Source: Figure 2.1 from Sargent (1982).

The Chaos of Exchange Rates

The single-currency solution

- Societies have disliked non-uniform currency systems because the currencies trade at different values—that is, different exchange rates.
- This can be avoided by having a uniform currency.
  - Panama is a country that does this by being dollarized.
  - The country accepts the U.S. monetary policy and the exchange rates associated with the dollar.
- If this happened with a cryptocurrency, that country would be accepting the monetary policy embedded in the code, along with exchange rates associated with that particular cryptocurrency.

Local versus global uniformity

- Locally, countries have wanted a uniform currency.
- Globally, we do not have a uniform currency. Instead we have a system of competing currencies with exchange rates.
- I am arguing that the current cryptocurrency wave may be driving the U.S. uniform currency system toward something more like the international non-uniform currency system.

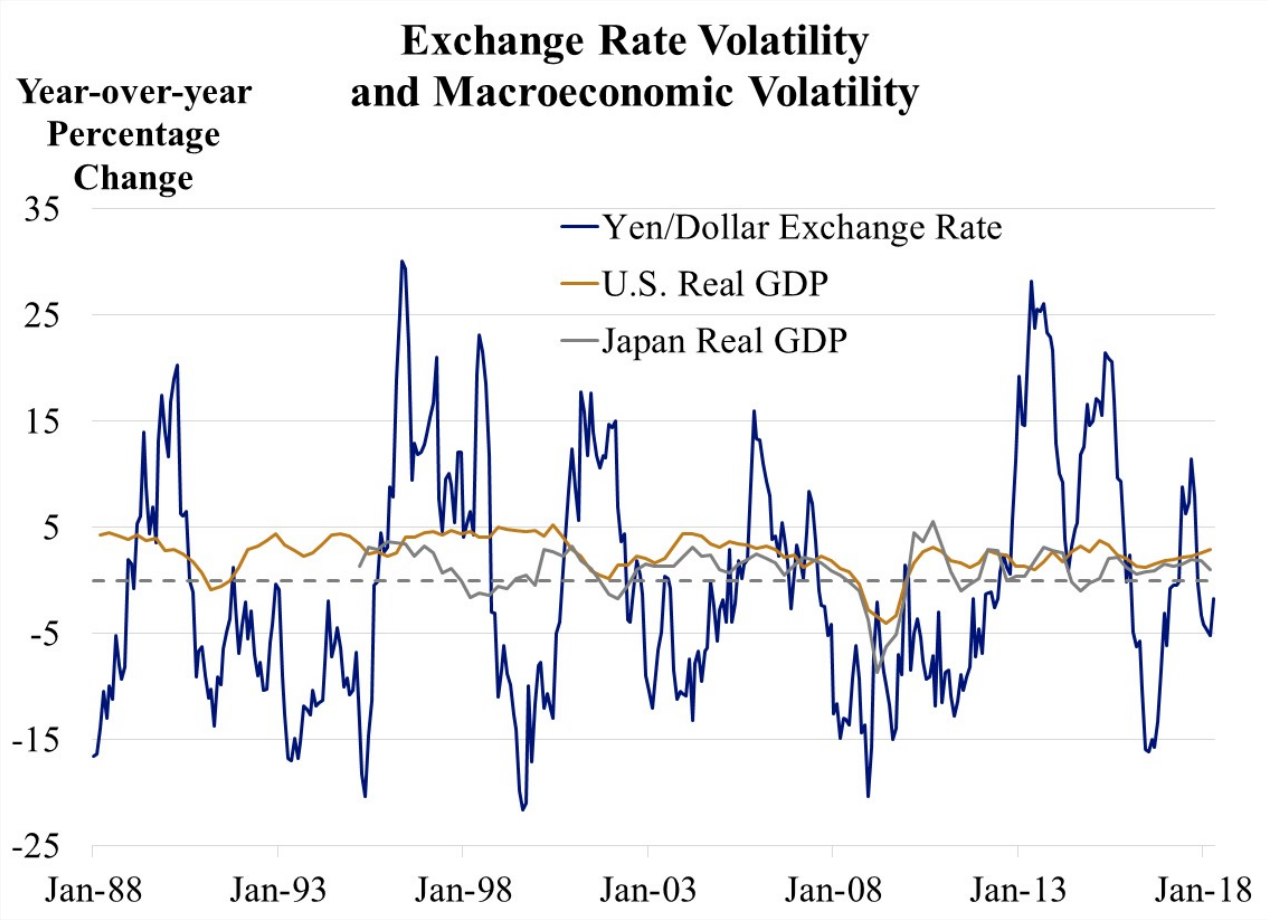
The controversial international monetary order

- Generally speaking, the international monetary order remains controversial, as the currencies seem to fluctuate excessively, attracting speculative trading and altering real capital flows.
- Governments can and do devalue suddenly, forcing investors to price in devaluation risk premia.
- This could be viewed as a distraction from the real business at hand, which is to use the price system to judge and assign value to goods and services globally.

Excessive exchange rate volatility

- The chart on the next slide illustrates what many consider to be excessive FX volatility.
- In the chart, the change in the yen-dollar exchange rate is much more volatile than fundamentals, such as real GDP growth in the U.S. and Japan, which are also plotted.
- The chart is impressive because both the U.S. and Japan have had relatively stable monetary policies during this period, but the exchange rate has fluctuated widely nevertheless.
- Bottom line: The global non-uniform currency system features volatile exchange rates. A local non-uniform currency system may have similar volatility.

The volatility of foreign exchange



Sources: International Monetary Fund, Bureau of Economic Analysis, Cabinet Office of Japan and author's calculations. Last observations: April 2018 and 2018-Q1.

Famous arguments on FX volatility

- Here is my take on some of the many views of FX volatility:
  - Hayekian: The chart shows that governments cannot be trusted to maintain the value of their currencies.
  - Friedmanian: The chart shows markets at work.
  - Wallacian: The chart shows that the relative price between two intrinsically worthless objects is indeterminate.
  - Mundellian: The chart shows a deadweight loss from non-uniform currency arrangements.

Conclusion

Conclusions

- The U.S. is drifting toward non-uniform currency trading arrangements, a system the society has disliked historically.
- Globally, we have an example of a non-uniform system of currencies, but these currencies trade at exchange rates that are often viewed as excessively volatile.
- Conclusion:
  - Cryptocurrencies may unwittingly be pushing in the wrong direction in trying to solve an important social problem, which is how best to facilitate market-based exchange.

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