The views expressed herein are my own and may not reflect the views of the Federal Reserve Bank of New York or the Federal Reserve System.
Overview

- Three papers:
  - “Accounts, Tokens and E-Money”
    - By Kahn, Rivadeneyra, and Wong
  - “Proof-of-Work’s Limited Adoption Problem”
    - By Hinzen, John, and Saleh
  - Shocks and Technology Adoption: Evidence from Electronic Payment Systems
    - By Crouzet, Gupta, and Mezzanotti

- Very interesting papers that provide important insights on blockchain, payments, and tokens
Key messages from the papers

- Accounts, Tokens, and E-Money: New technologies make issuance of CB tokens feasible (and perhaps desirable)
  - Trade-off between safety and convenience
  - Who should be responsible when problems arise?
- Proof-of-Work’s Limited Adoption Problem: Limitations of permissionless systems
  - Permissionless systems may have to remain small for technological reasons
  - Permissioned alternatives may not suffer from that problem
- Shocks and Technology adoption: Importance of network effects in payment arrangements
  - It may be difficult to move from one arrangement to another
  - Shocks (or public policy) can facilitate a transition
There are arguably two revolutions occurring in the world of retail payments:
- Cryptocurrencies
- Faster/mobile payments

While generating less attention than cryptocurrencies, faster payments have had profound effects.
The papers in this session touch on both of these developments.
Cryptocurrencies and payments

- Cryptocurrencies, like Bitcoin, allow the transfer of value even absent trusted intermediaries
  - That is amazing
  - But is it useful?
- Two papers in this session help us understand some limitations of cryptocurrencies
  - Paper on PoW makes it clear that technological constraints limit the network’s size
  - This is a problem given the role of network effects, as noted in paper on demonetization
- Other issues have been noted in the economics literature; this one seems particularly relevant
What about permissioned ledgers?

- Paper on PoW argues that consensus on permissioned ledgers can overcome limited adoption problem
- What the paper doesn’t address is why Blockchain is a good payment solution when a trusted intermediary exists
- The paper on Accounts and Tokens may provide a rationale for permissioned Blockchain
  - Central bank is trusted, so PoW is unnecessary
  - Tokens may be useful protection from bad actors
- More research would be useful to understand the benefits of permissioned ledger in payments
What if the future is not cryptocurrencies?

- Faster/mobile payments have profound effects on the payment landscape
  - Example: Swish and the decline of cash usage in Sweden

Illustration 1: Value of banknotes and coins in circulation.
Note: Banks' holdings are excluded.
Sources: Statistics Sweden and Sveriges Riksbank.
Network effects and public policy

- Network effects seem to play an important role in the case of Sweden
  - As they did in the paper on demonetization
- If switching from one arrangement to another is difficult, official sector institutions may have a role to play
  - Demonetization in India may be an example
- An important question to consider is:
  - Should the private sector or the official sector issue e-money?
The distinction between tokens and account has been a useful device to organize our thoughts about payment systems.

The emergence of cryptocurrencies challenges this classification.

- A private key looks a lot like an account.

New payment methods give us an opportunity to rethink existing classifications and perhaps discover a better one.
To sum up

- Very interesting set of papers that provide important insights about the evolution of the payment landscape

- My personal takeaways:
  - Cryptocurrencies are probably not the future of payments
  - Network effects in payments give public policy an important role in a changing payment landscape

- Topics for future research:
  - We need to better understand what permissioned Blockchains can add to payments (if anything)
  - We may need to rethink how we categorize payment systems