On the Essentiality of Electronic Money
Jonathan Chiu and Tsz-Nga Wong

Discussion: William Roberds\textsuperscript{1}

FRB Atlanta

April 3, 2014

\textsuperscript{1}Views expressed are solely those of the author.
What does this paper contribute to payments economics?

- Instructive examples of optimal pricing of payments
- First-principles approach
Payments as IT

- Kocherlakota 1998 JET (also Taub 1994 IER; 1987 Townsend AER)
- Money (& other payment technologies) are a form of recordkeeping
  - less information than full recall ("memory")
  - imperfect info may impose (hidden action) constraints
- Optimal pricing:
  - supports best possible allocation, subject to IT constraints
- C & W show slight relaxation of anonymity relative to money
  - can provide a “credit benefit” (with proper pricing)
  - can attain first-best when money cannot
Model environment-basic features

Why are payments needed?

- Lagos & Wright 2005
- Each period has 2 subperiods [intertemporal displacement]
  - centralized market (CM): “merchants” buy, “consumers” sell
  - decentralized market (DM): consumers buy, merchants sell
- Consumers not recognizable in DM [identity friction]
  - DM transactions occur through random matching & bargaining
  - CM Walrasian
- Authors consider 4 payments technologies for DM
  - technologies have no physical cost
Payments technology 1: cash

- Consumers sell goods for cash in CM, buy goods with cash in DM
- “Cash in advance” overcomes DM identity friction
- Problem 1:
  - under CIA, consumers credit-constrained, no first-best
  - can relax through Friedman-Rule deflation
- Problem 2:
  - FR impractical (how to finance?)
Payments technology 2: money mechanism

- Consumers & merchants (voluntarily) report money holdings to issuer at end of CM
- Money issuer then transfers balances among reporting agents
  - transfers financed via inflation
  - agent’s type observable by money issuer {quibble}

Result: MM can achieve first-best without deflation
  - example: money issuer “tops up” consumer balances at end of CM

Needed:
  - high bargaining power for consumers (reward for participating in MM)

Note:
  - high inflation makes implementation easier (punish nonparticipation in MM)
Payments technology 3: e-money & limited participation

- In addition to money, people can transact with “e-money”
- e-money: looks just like money, but issuer observes transfers
  - no one forced to hold e-money (“limited participation”)
  - e-money mechanism #1:
    - issuer receives reports, makes transfers at the end of CM
    - key: observability of transfers mitigates hidden action
- Result: EMM1 can achieve first-best in more circumstances than MM
  - example: consumers with suff. e-money get “e-coupons” at end of CM
  - merchants pay a fixed fee in order to accept e-money payments
- Intuition: fees paid by merchants slacken consumers’ participation constraints
  - such fees problematic in MM
Payments technology 4: e-money & limited transferability

- e-money: just like in payments technology 3, except
  - e-money mechanism #2: issuer receives reports at the end of DM
  - e-money issuer collects % of e-payments to merchants
  - uses merchant fees to subsidize consumers

- Result: EMM2 can achieve first-best in more circumstances than either MM or EMM1

- Intuition:
  - merchant fees slacken consumers’ participation constraints as in EMM1
  - ex post EMM2 fees slacken merchant’s participation constraints relative to EMM1
Takeaways

1. Key advantage of electronic payments: *increased information flow*
   - slight increase in info allows more general fees, can increase efficiency

2. Optimal merchant fees $> 0$, **even if physical cost of payments $= 0$**
   - positive merchant fees can relax constraints on consumers ("credit benefit")

3. Size & scope of payments, & prices paid, **not exogenous** to payments technology
Qualitative to quantitative

- Wish list
  - incorporate **additional benefits** beyond “credit benefit”
    - convenience, security, etc.
  - allow for **multihoming**
  - go beyond L & W structure
    - heterogeneous agents, etc.
    - (numerical solutions)
  - **calibration** with panel data on households’ transactions
- End result: **quantitative predictions** about optimal payment pricing