

On the Essentiality of Electronic Money

Jonathan Chiu and Tsz-Nga Wong

Discussion: William Roberds¹

FRB Atlanta

April 3, 2014

¹Views 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