Discussion:
Financial Technology Adoption
by Sean Higgins

7th ABFER Conference
Singapore

Ben Charoenwong

NUS Business School

Overview

- What market?
  - Demand of debit cards & Supply of debit cards (readers)
  - Not of money.
- Setting: Positive Demand shock of 1 million debit cards
- Contribution: supply side (retailer) response to demand shocks – interesting from an equilibrium perspective
  - And spillover back to demand (more readers → more card adoption)
- Fintech space:
  - Lending, international flows, personal finance, equity financing, insurance, consumer banking, payments.
- Unique feature: this "fintech" has network effects.
  - This means that it would need a sufficiently big shock to cause a network phase transition.
- Still money, but looks different.

Comments

1. Contextualizing the Motivation

2. Network Phase Transition

3. Identification

4. Implications

1. Contextualizing the Motivation

Research Q is hard for four reasons:

1. Tech adoption endogenous
   - Gov't Shock
2. Supply side response endogenous to how much demand adopts
   - Big shocks
3. Identifying indirect network effects
   - Control group
4. Data Issues
   - Big brother

- What makes this unique?
  - Benchmark results with cellphone adoption in Sub-Saharan Africa? (Aker & Mbiti JEP 2010)
  - Compare shock sizes with Björkegren (forthcoming) in Footnote 7.

1. Contextualizing the Motivation

- History has instances of new network-effect adoptions in the "fintech" space:

- King Croesus replaced electrum coins with gold and silver coins in 6th century BC.

- "So far as we have any knowledge, they [the Lydians] were the first people to introduce the use of gold and silver coins, and the first who sold goods by retail." - Herodotus

Similarities:	Differences:
1. Large gov't shock	1. No control group 2. Data availability

2. Network Phase Transition

Adopt Card

Consumers

Adopt Card

Stores

?

MB of card ↑
Adopt Card

How to identify?
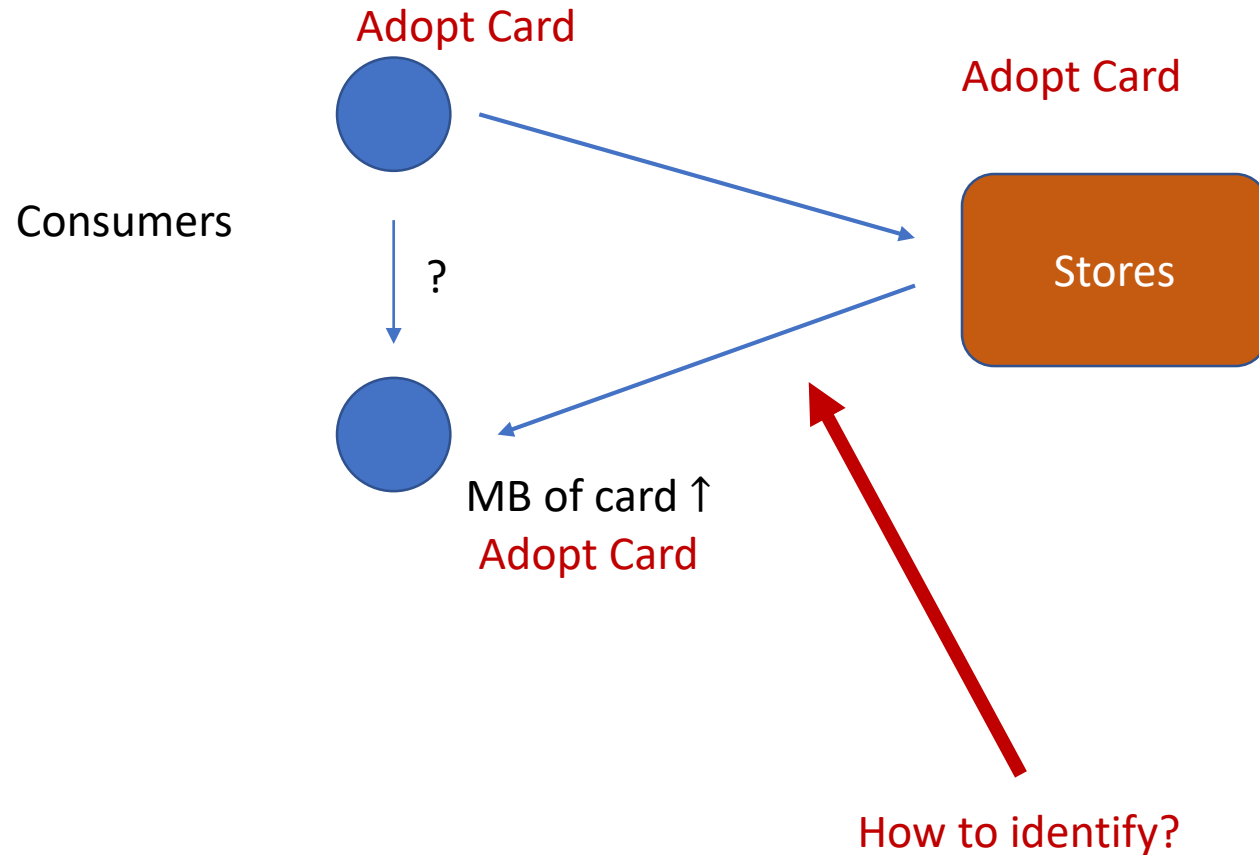
2. Network Phase Transition

From: Ballester, Calvó-Armengol, and Zenou (2006), adopted for bipartite graph
(set up is looks like normal strategic complementarity)

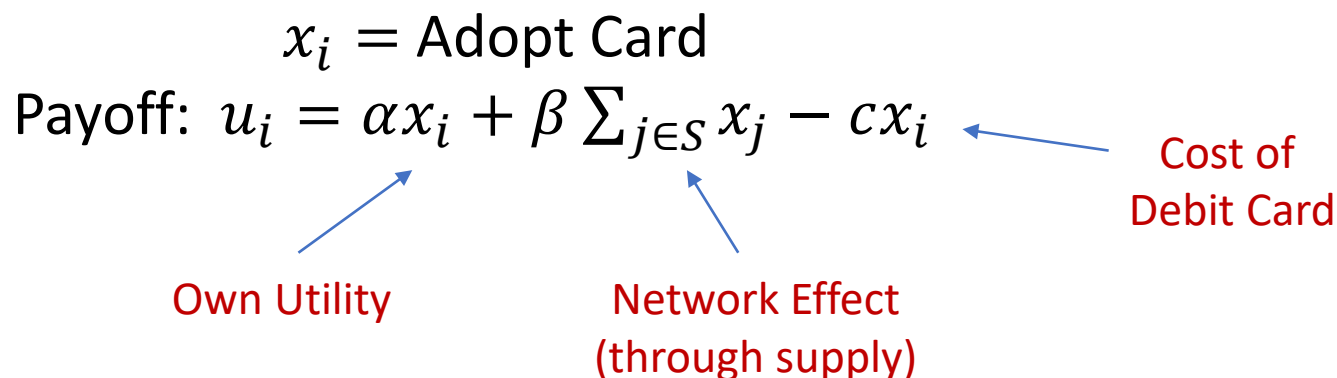|	**Adopt Card**	**Stay Cash**
Adopt Card	(u_i, u_i)	$(\alpha, 0)$
Stay Cash	$(0, \alpha)$	$(0, 0)$

$$x_i = \text{Adopt Card}$$

Payoff: $u_i = \alpha x_i + \beta \sum_{j \in S} x_j - c x_i$
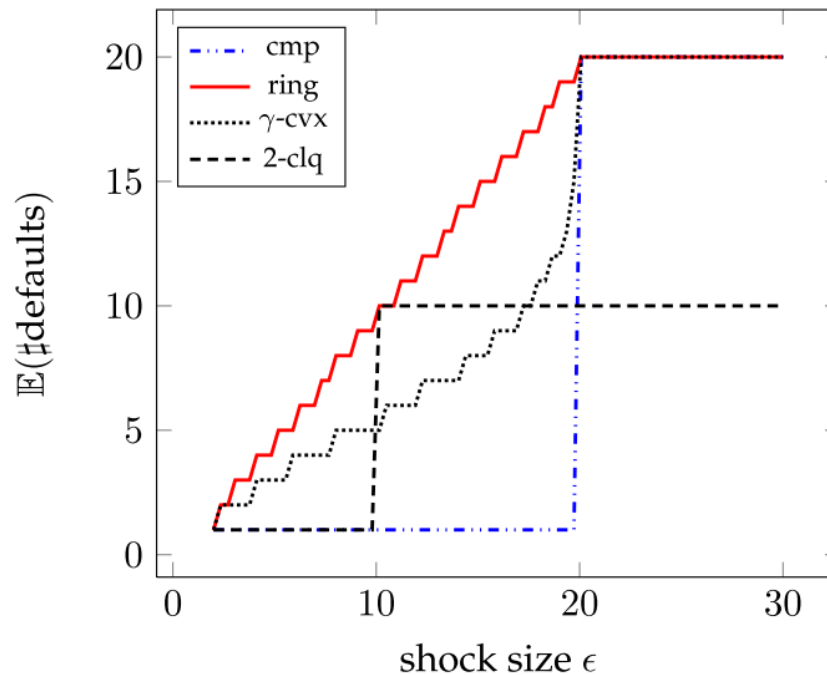
Own Utility

Network Effect
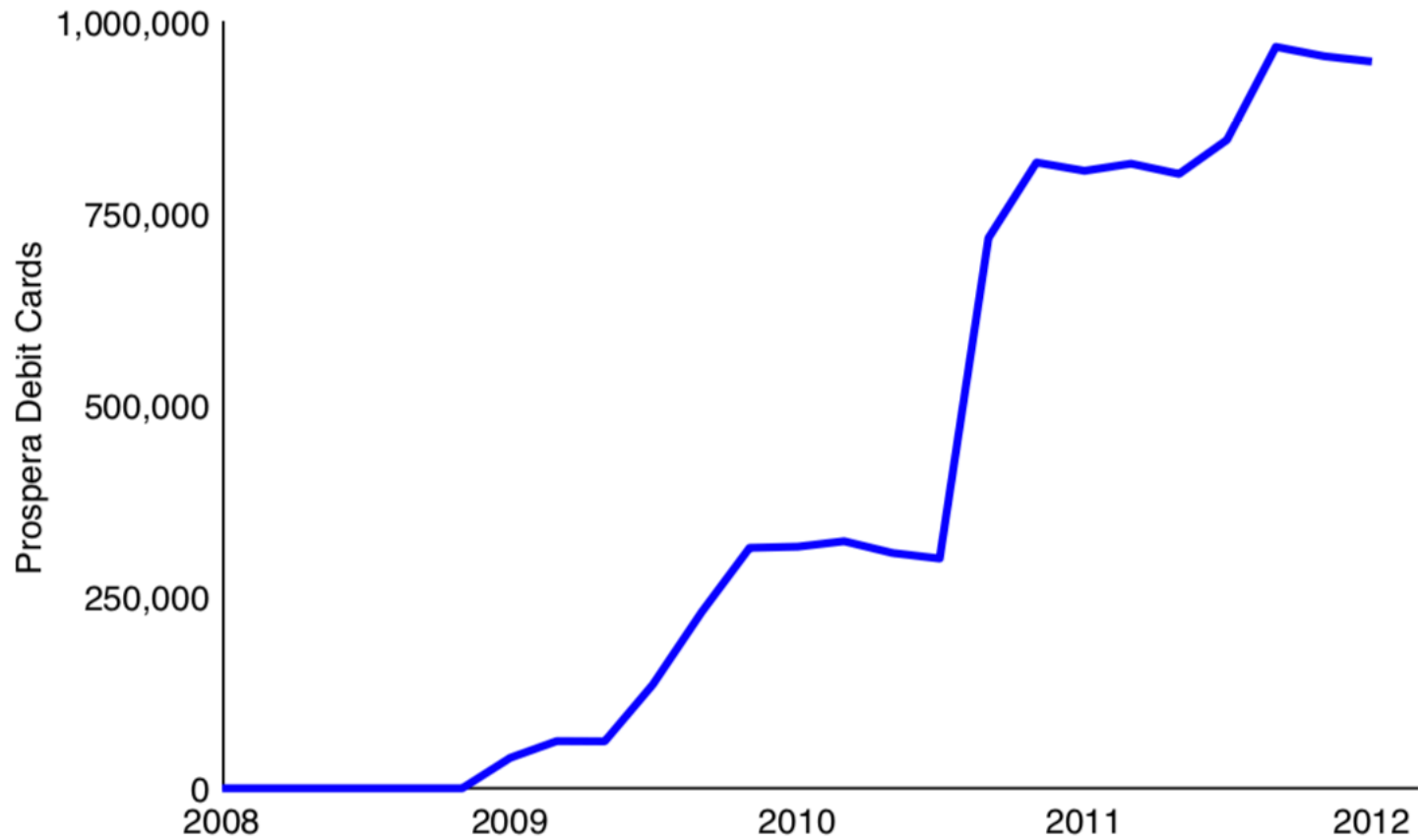(through supply)

Cost of
Debit Card

2. Network Phase Transition: Network Structure Matters

- In network models, usually need a shock that is big enough to switch "equilibria".

- From Acemoglu et al. 2015 AER: Complete networks, Ring, Convex combination of ring & complete, Double-clique network of two disjoint components

(a) Single shock $m = 1$

- This setting: bipartite.

This figure shows when beneficiaries in each urban locality received debit cards from Prospera. It uses administrative data from Prospera on the number of beneficiaries and payment method in each locality during each payment period, which I used to impute when the debit card shock occurred in each locality; it also uses locality and state shapefiles. $N = 259$ urban localities in card rollout.

3. Identification

- Several methodologies used, clever for average treatment effects

1. DiD: What happened to those that were treated relative to those initially not treated?

2. DiD/IV: After treated, do retailers increase usage?

3. DiD: Treated can become control: What happens to those w/ spillovers compared to those that are already treated?

- Suggestion: Write out supply and demand structural linear equations and walk through the shock & timing. Will help the methodology section.

- Please show parallel trends in levels, so can see aggregate trends

- Exploit tighter geographical variation to test the channel from supply responses back to demand responses?

4. Implications: Back of the envelope calculations

- How much did total net profits of firms go up and how much did spending go up?

  Local multipliers?

- Slippage: How much did banks collect in fees from supply side and demand side?

- Did cash inventory in their accounts change?
  - Changes in number of visits on avg suggest it may change
  - Cash inventory ↓, number of visits ↑

- Total change in spending before and after rollout?

  (Agarwal et al. 2019)

- Re-distribution from supermarkets to corner stores due to reduced transaction costs.

- Consider estimating equations for adoption at the person-level, highlighting the indirect network effect.

- Food for thought: What size shock is needed?

Overall

- Extremely interesting data set

- Well-executed and motivated paper with good identification

  - Expanding motivation would increase readership

  - Could use more on the mechanism to link the full picture

- Contribution could be highlighted beyond identifying spillovers to focus on implications for policymakers.

  - How can they pick more efficient, win-win equilibria that involve a coordination problem?

  - i.e. "How big of a shock do you need?"

Minor

- Intro: p. 2, "First, technology adoption is endogenous."
  - Exactly the point. Seems a bit redundant with the 4th point.
- Effect of card on consumption is not really a "spillover" in the standard sense. It comes through a direct reduction of transaction costs.