Discussion of Timing is Everything
by Bauer and Gerdes

Ben Craig

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Standard Disclaimer

The views in this discussion are my views only, and not necessairily those of the Federal Reserve Bank of Cleveland, nor those of the Board of Governors of the Federal Reserve System

What this paper does

- Basically a description of the history of the adoption of a new technology in the presence of network externalities

- Network externalities delay the adoption of the new check clearing technology
  - This was mitigated by policies which eased the large fixed cost of adoption
  - The result was a surprisingly fast adoption of the new technology

Payments systems are especially susceptible to sub-optimally slow adoption of new technologies

Like all interesting statements from econometric work

- "because of Check 21, banks were able to adopt at their own pace….Allowing the demand for the new technology to be based on economic decision-making and accelerated by the network spillover, avoided a variety of pitfalls that might have occurred if a more disruptive regulatory method had been chosen."
  - This is a **structural** statement (like any counter-factual statement.)
  - Structural statements require identification.
    - My strong preference is for the identification to be clearly spelled out.
  - This is quite difficult as the system as described is quite complex

Strategy of this paper

- Use an incredibly detailed data set from the Fed on pricing and many other characteristics of the banks and the relationships to create an **X** matrix which measures everything we need.
    - Then use a robust hazard estimation such as Cox proportional hazards to estimate the hazard rate of adoption.
    - The structure is then inferred from the effects of the variables in **X** on the hazard rate.
- Within the literature (where this is the standard method of identification), this is a very fine example of this form.

# But it depends on two very strong assumptions….

- **X** is complete: that is, there is no heterogeneity floating about.
  - Things are complicated greatly by the fact that in the estimation of hazard rates
    - estimation vitiates some standard plans of handling heterogeneity through standard models such as "fixed effects"
      - (because of incidental parameters)
    - Heterogeneity can be especially nasty because of censoring, so that one is thrown into strong proportional hazard rate assumptions, or strong parametric assumptions about the distribution of the heterogeneity.

- **X** is exogenous.
  - Even if true this often makes the counter-factual questions very limited.
    - For example, one can answer questions about "what if we increase an element of **X**, x_i, to $x_i + \Delta$, what would have been the effect on the hazard of adoption?" but not "what is the socially optimal price to charge the banks for each technology?"

But is X exogenous? What are we assuming?

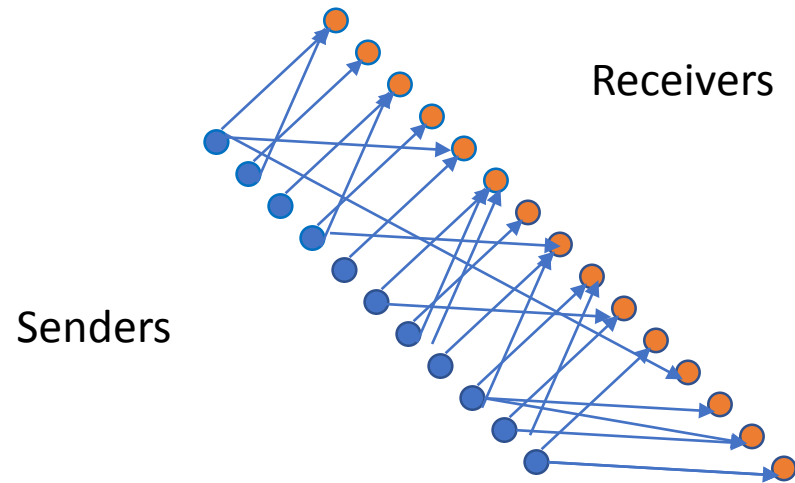For me it often helps to design my identification by first diagramming what I know about the network.

"Network Externalities of Adoption"

Bipartite Network
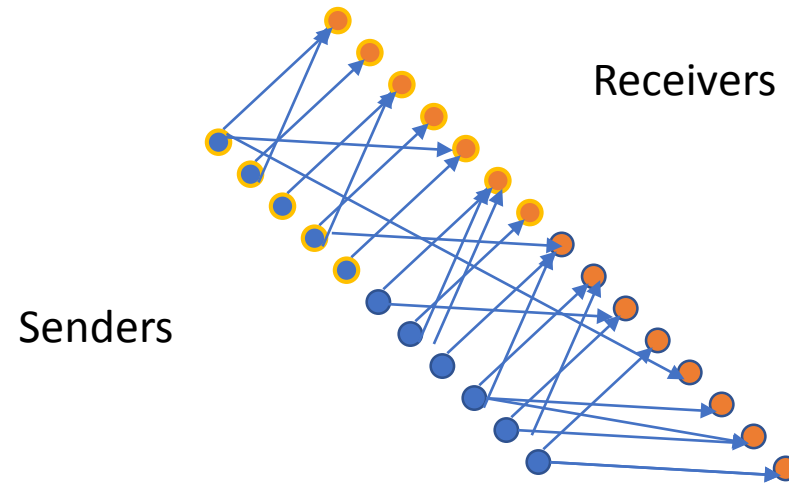
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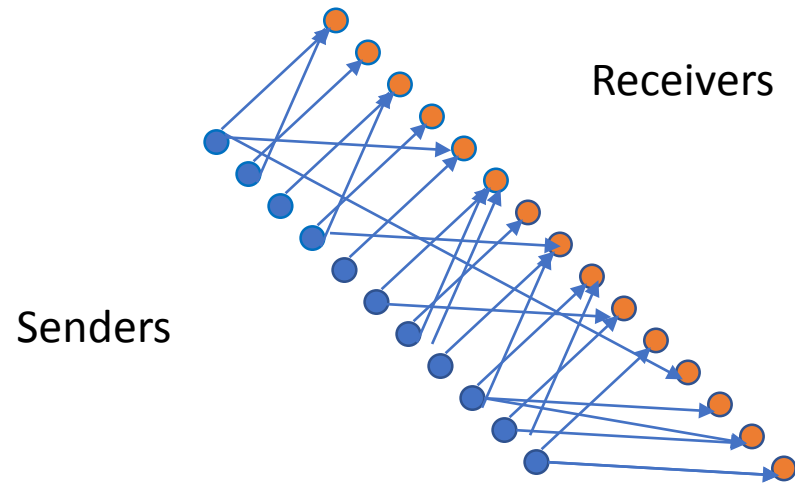
Before Adoption

"Network Externalities of Adoption"

Before Adoption

After Adoption

Questions that come up

- Are the edges endogenous? Probably not because the text asserts that banks will often choose their clearing system depending on their characteristics. Thus, the network itself is endogenous, and the variables in **X** are also endogenous.

- Does the structure of the network explain the division of the surplus between two nodes (and thus the adoption of the technology as this affects the division of the surplus?)

However, lest you think that network analysis only makes things hopeless…

Often networks will hint at better instruments.

- An example would be the "unsolvable reflection problem" of Manski that is trivially solved if one has an incomplete network.
  - Although this is not that relevant here...
- The network structure outlined here might give rise to identifying instruments in the cost function
  - For example...

"Network Externalities of Adoption"

Before Adoption

After Adoption
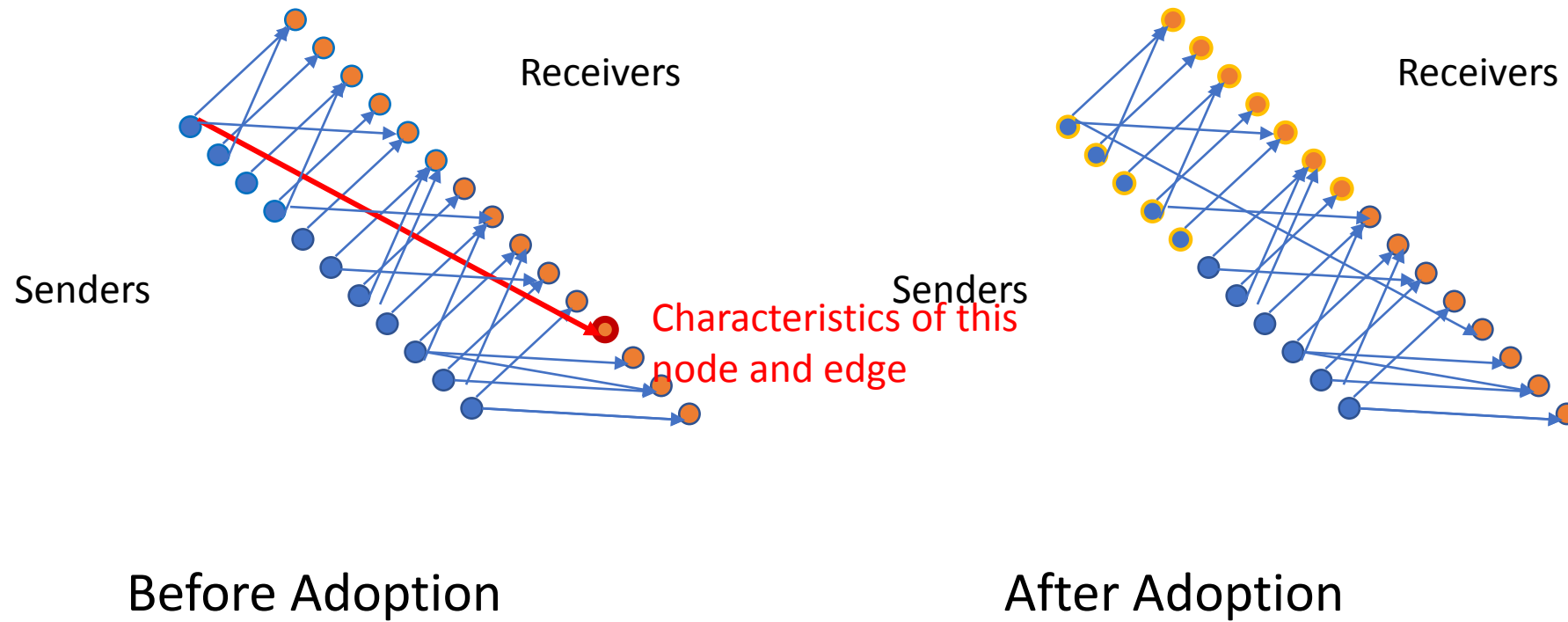
"Network Externalities of Adoption"
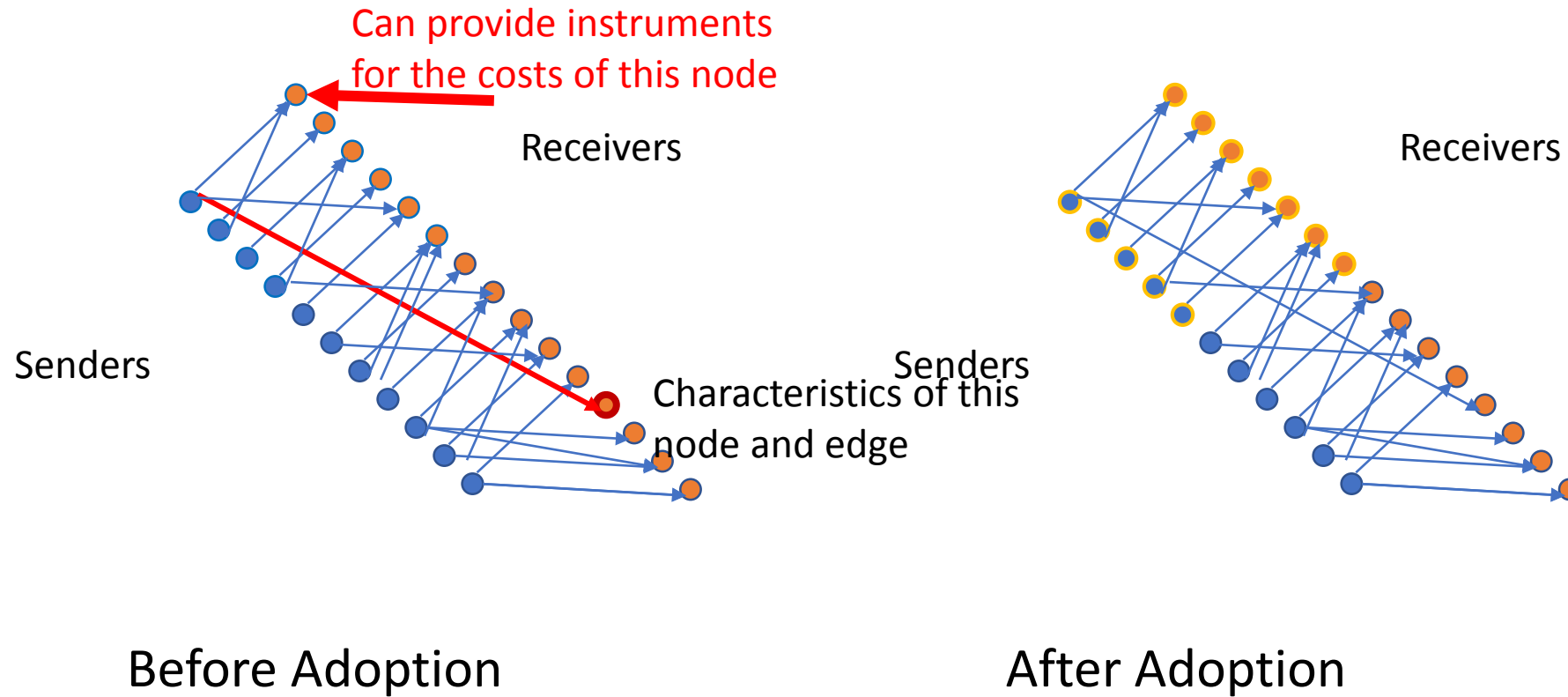
This is a good paper that

- Provides a great institutional overview of the major factors involved in the adoption of the new technologies with a payments mechanism.

- Provides reliable estimates of the hazard of adoption and how it depends on many observables including Fed decision variables.

Thank you very much for the opportunity to discuss the paper!