

*First workshop on Agent-Based Modelling for Banking and Finance*

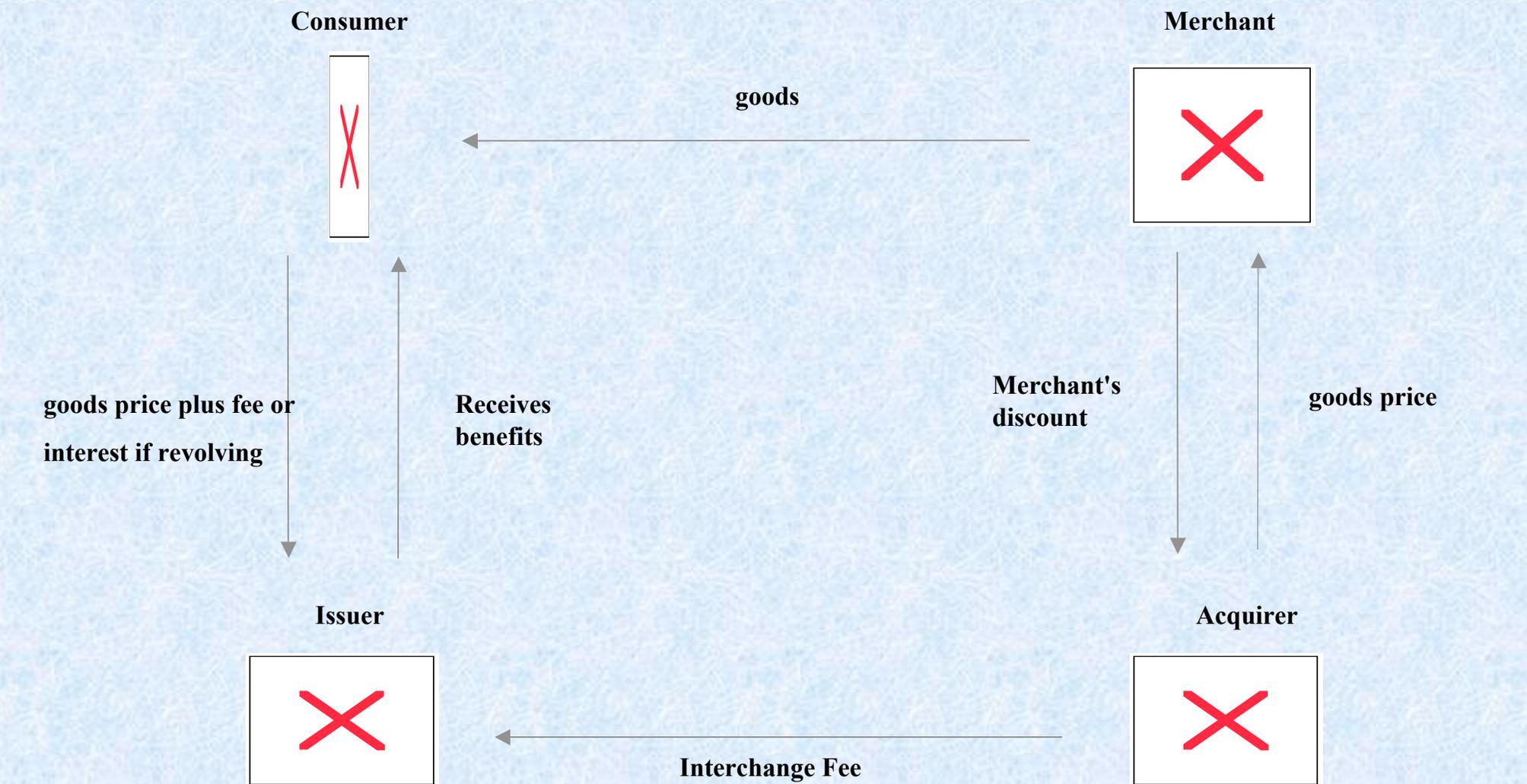
*“Agent based modelling of a Payment Card Market: from understanding the competition to policy making by Biliiana Alexandrova-Kabadjova – Discussion”*

**Luca Arciero**

*Torino, February 2009*

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# *A basic credit card market*



# *Theoretical models*

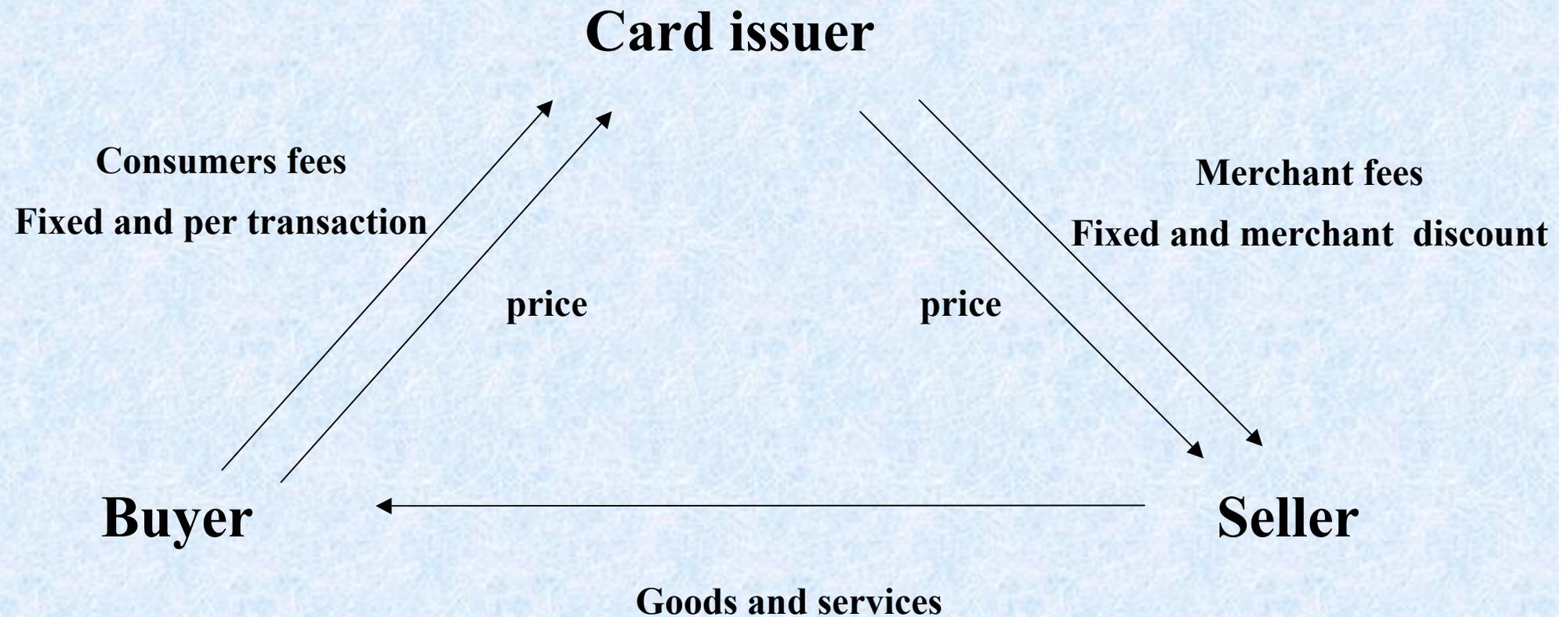
**Credit card markets fall within the two-sided market models**

*“..market where one or several platform enable interactions between end-users and try to get the two (or multiple) sides “on board” by appropriately pricing each side” (Rochet-Tirole, 2006)*

**Examples: newspapers (readers and advertisers), shopping malls (merchants and consumers), night clubs (men and women)**

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# *Setting prices in two-sided markets*



# *Setting prices in two-sided markets: monopoly*

**Monopolist should take into account both sides when maximising profits**



**where**

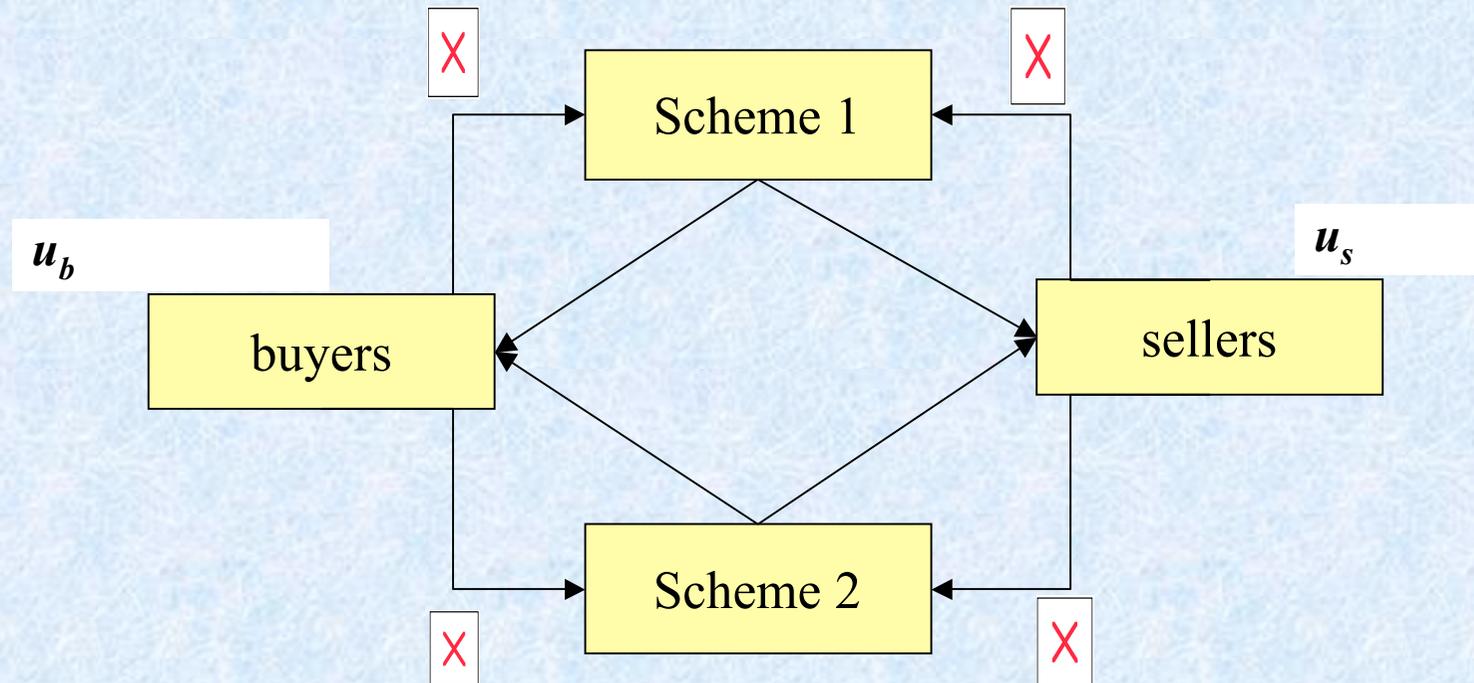


**Rochet-Tirole (2003) find an interior solution where optimal pricing for monopolistic platform with no fixed fees**

**Bolt and Tieman (2008) show a corner solution where the buyers are not charged (no fixed fees)**

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# Setting prices in two-sided markets: competition



- agents are willing to transact on a platform if  $u_j \geq p_j$
- if  $u_j \geq p_j^1$  and  $u_j \geq p_j^2$ , agents prefer platform with lower price
- if  $u_j \geq p_j^1 = p_j^2$ , 50% prefer scheme 1, the others scheme 2
- choice is determined by the buyer

# *Issues in competition on two-sided market*

**Bolt and Soramäki (2008) show that that corner solutions (only one side is charged) may arise when both sides are willing to transact on multiple scheme**

**Future, more complex models need considering:**

- *Multiple scheme*
  - *Endogenous membership decision and multihoming*
  - *Ornate tariffs (fixed and per transaction fees) and price discrimination*
  - *Time dimension*
  - *Interchange fee*
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# *Agent based approach by BAK*

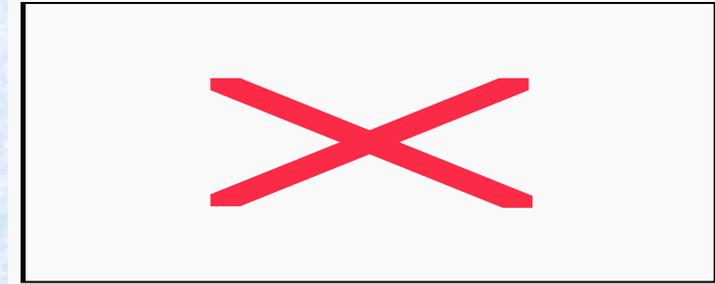
**Payment card markets are complex and hard to model**

**The paper by Biliana Alexandrova-Kabadjova (BAK) shows how some open issues in the traditional approach to the two-sided market may be overcome by using agent based models**

- *Multiple scheme*
  - *Endogenous membership decision and multihoming*
  - *Ornate tariffs (fixed and per transaction fees) and price discrimination*
  - *Time dimension*
  - *Interchange fee*
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# *Remark 1: BAK Merchant selection rule*

*Probability of selecting a merchant.  
It depends positively on the number of  
common payment methods*



*As payment methods involve many payment cards and only once cash, could merchant accepting payment cards be over-chosen?*

*If price discrimination is allowed, why do consumers do not consider past prices when selecting a merchant?*

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## ***Remark 2: BAK payment method selection rule***

***Probability of selecting a payment method. The consumer pays with card if the transaction's price benefits are greater than the price increase. Otherwise pays with cash***

***Cash inventories are decided before shopping and people may have a benefit in decreasing them by using cash payment methods.***

***Benefits may be partly endogenous. If consumer pays by card A at previous rounds, he could use again it to avoid multiple statements***

***Do consumers prefer pay by cards at the beginning of period to earn from floating?***

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# *Possible extension: Interchange fee*

*BAK shows that different levels of interchange fee has an important impact on the payment card adoption rate*

*I guess that here the IF is a multilateral one. Antitrust authorities do not seem happy with multilateral IFs but they are favourable to bilateral interchange fees.*

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