

# Frame and Rule: Stability and Change of the Economic Behavior

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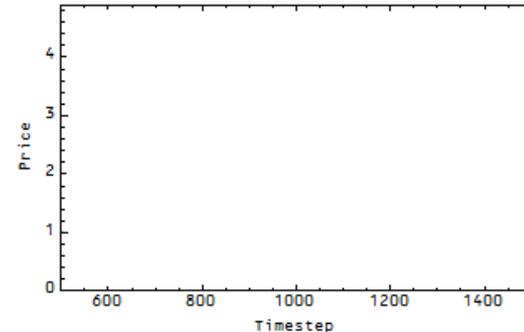
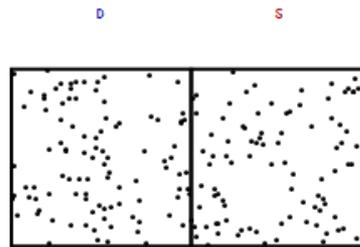
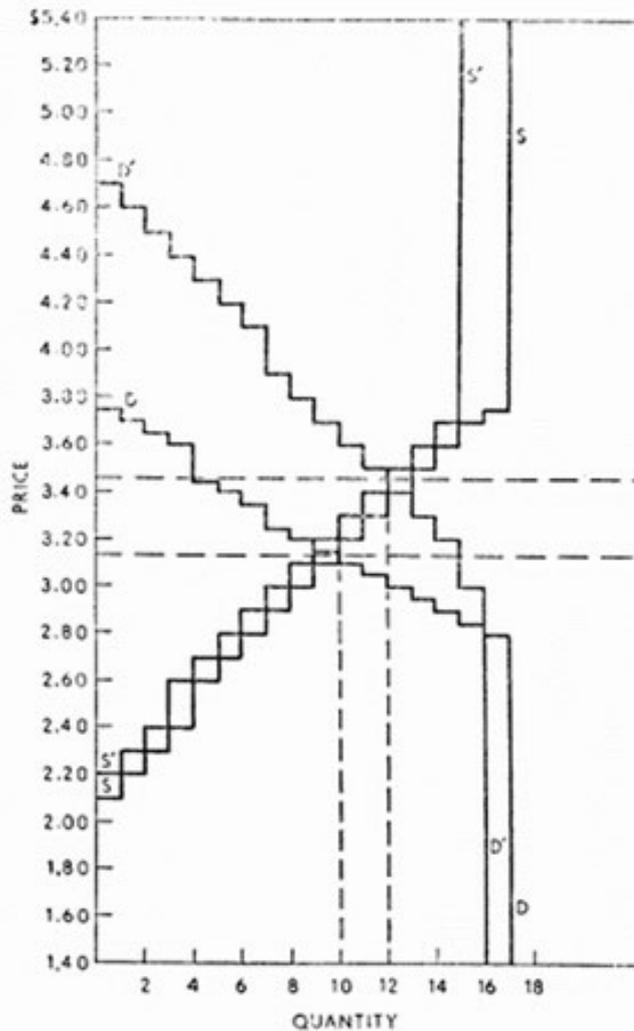
# The Very First Experiment in Economics

A young student reflected on an experiment he had participated in at Harvard in 1946 under supervision of E.H. Chamberlin . He writes about ....

“Chamberlin gave each buyer a card with a maximum buying price for a single unit, and each seller a card with a minimum selling price for one unit. **All of us were instructed just to circulate in the room, engage a buyer (or seller), negotiate a contract, or go out to find another buyer (or seller) and so on.**

If a buyer and a seller made a contract, they were to come to Chamberlin, reveal the price of the exchange, turn in their cards, and he would post **the price on the blackboard for all to see**. When it was all over, he would reveal the implicit demand and supply schedules.”

# Is Economics an Experimental Science ?



**Edward H. Chamberlin (1948) first reported market experiment :**

*Outcome deviated systematically from the competitive predictions. Perhaps it is the perfect market which is "strange"; at any rate, the nature of the discrepancies between it and reality deserves study*

# The Vernon Smith's Insomnia

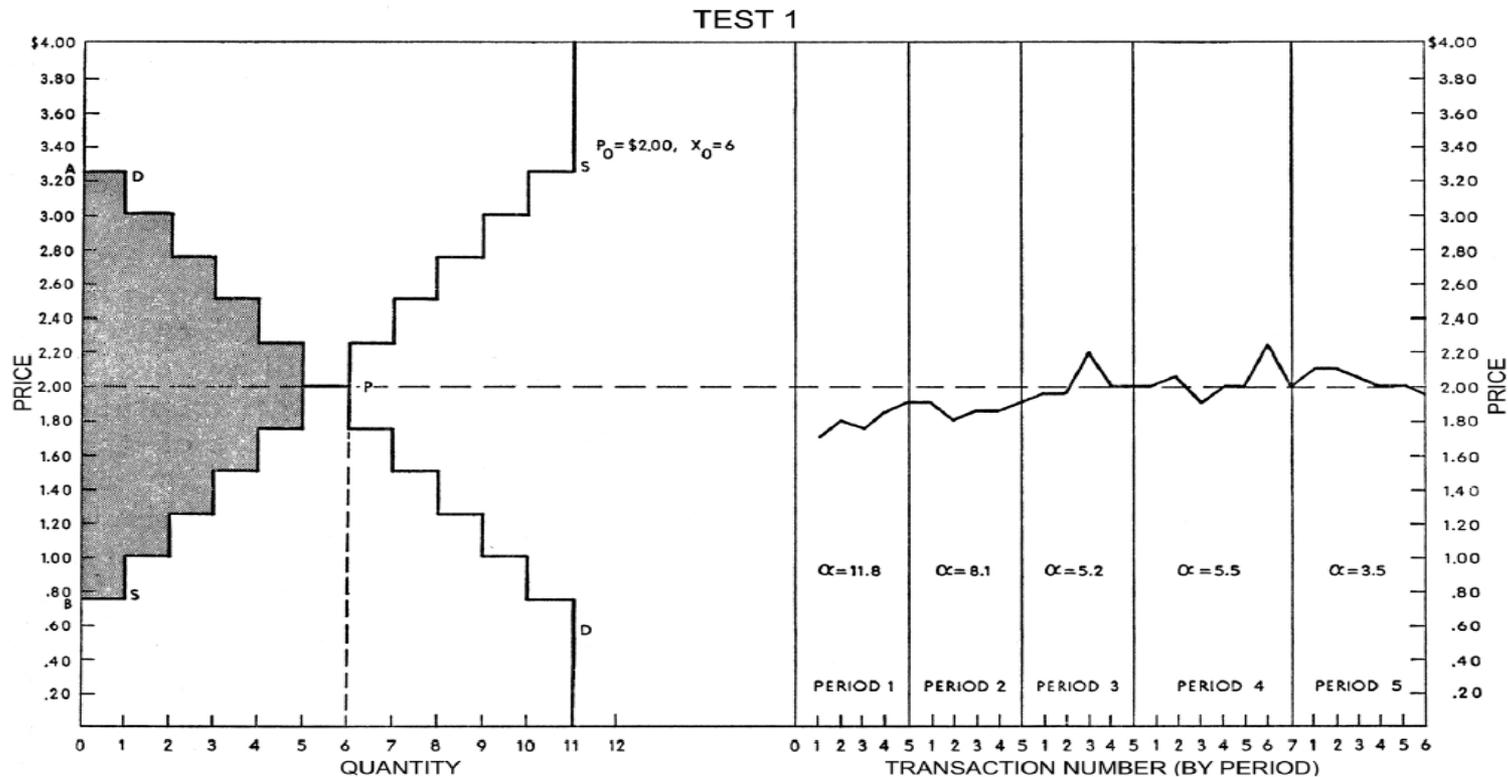
The Student was a newly minted Assistant Professor named **Vernon Smith**, in **1955 at Purdue University** and he had insomnia and reflected on an experiment he had participated in at Harvard in 1946 under supervision of E.H. Chamberlin.

“So there I was, wide-awake at 3 am, thinking about **Chamberlin's “silly” experiment**. ....When it was all over, we would learn the important lesson that supply and demand theory was worthless in explaining what had happened; **namely that prices were not near the equilibrium and neither was the quantity exchanged**.

The thought occurred to me that **the idea of doing an experiment was right**, but what was wrong was that if you were going to show that competitive equilibrium was not realizable... **you should choose an institution of exchange that might be informationally more favorable to yielding competitive equilibrium**.

**Instead of having the subjects circulate and make bilateral deals, why not use the double oral auction procedure, used on the stock and commodity exchanges?** The institution of exchange that would be “informationally more favorable to yielding a competitive equilibrium” was the double oral auction.

# Double Oral Auction



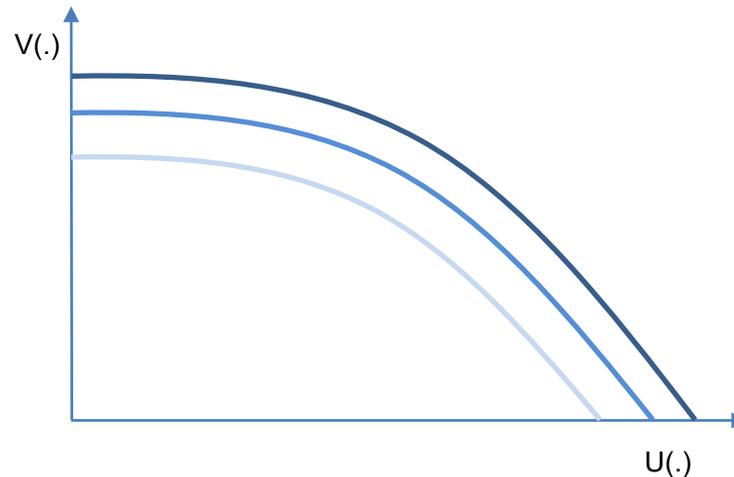
Vernon L. Smith (1962), Nobel Prize in 2002

Double auction institution :  
**Bids, asks and prices are public information →**  
**converge to competitive outcome**

# Nash Demand Game with Uncertainty

Two players have to divide a pie :  
Each demands a positive part.

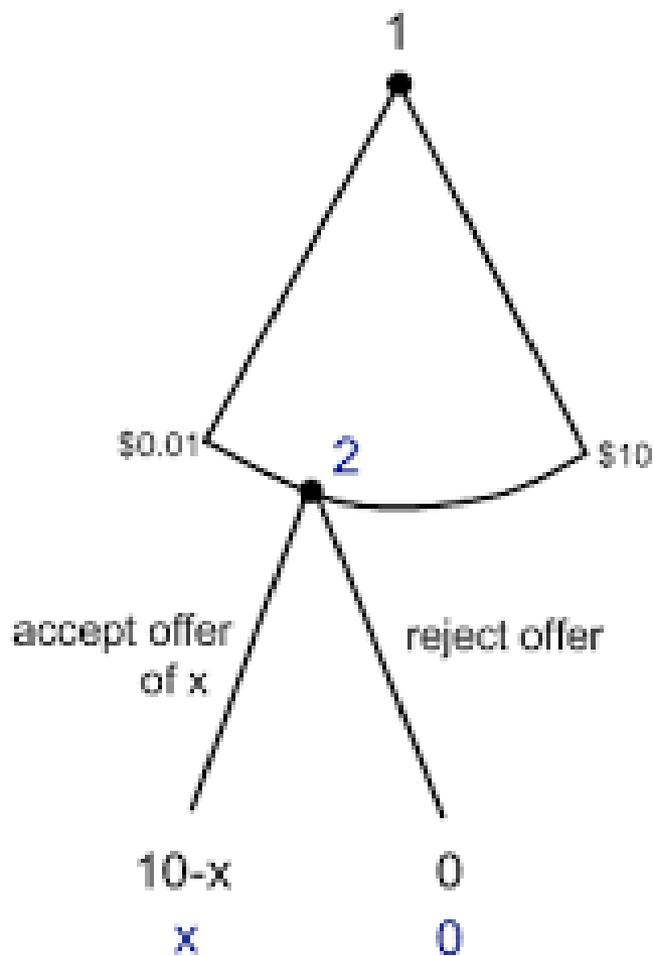
- Each receives his demand if the total demanded is smaller than the size.
- Otherwise both earn nothing.



K. Abbink et J. Brandts (2008)

O. Andersson C. Argenton and J. W. Weibull (2018)

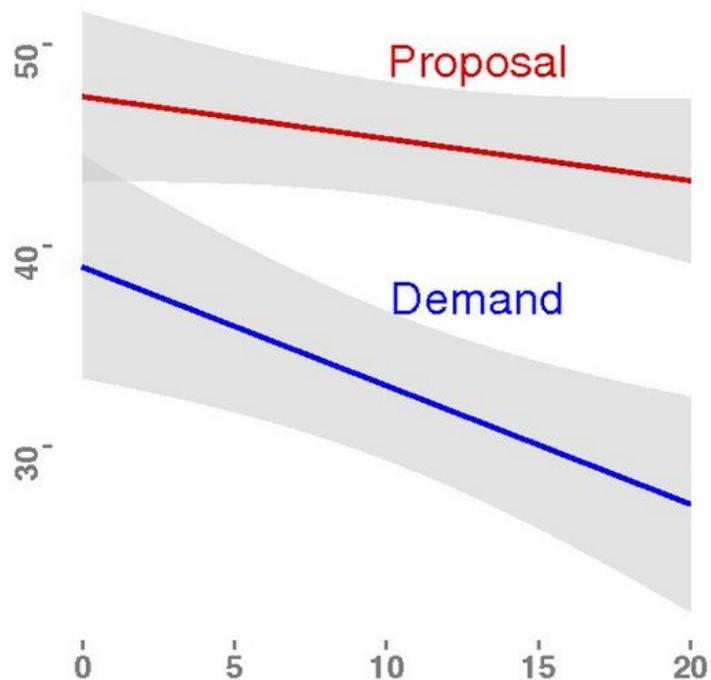
# Stability and Changing Rule



## Ultimatum Bargaining Game

Güth, Schmittberger, & Schwarze, 1982)

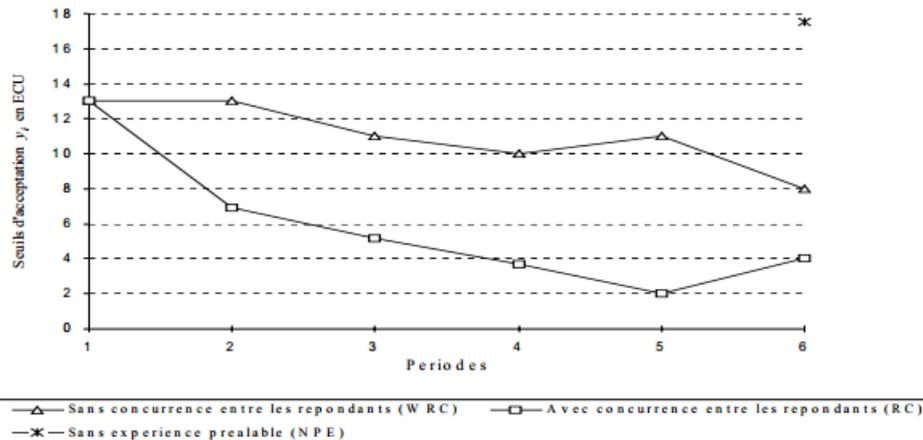
### Equilibrium and Fairness



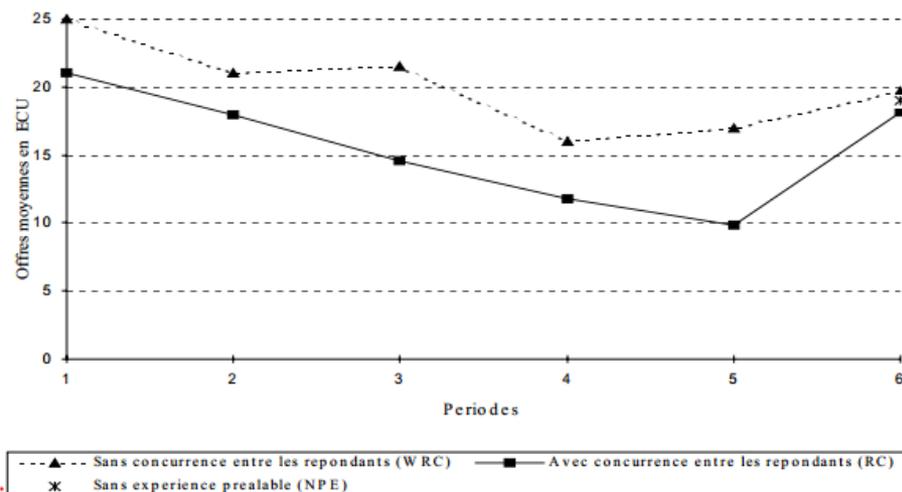
# Stability and Changing Rule

## Ultimatum Bargaining Game With Competition (Güth, Marchand, & Rulliere, 1998)

Seuils d'acceptation moyens



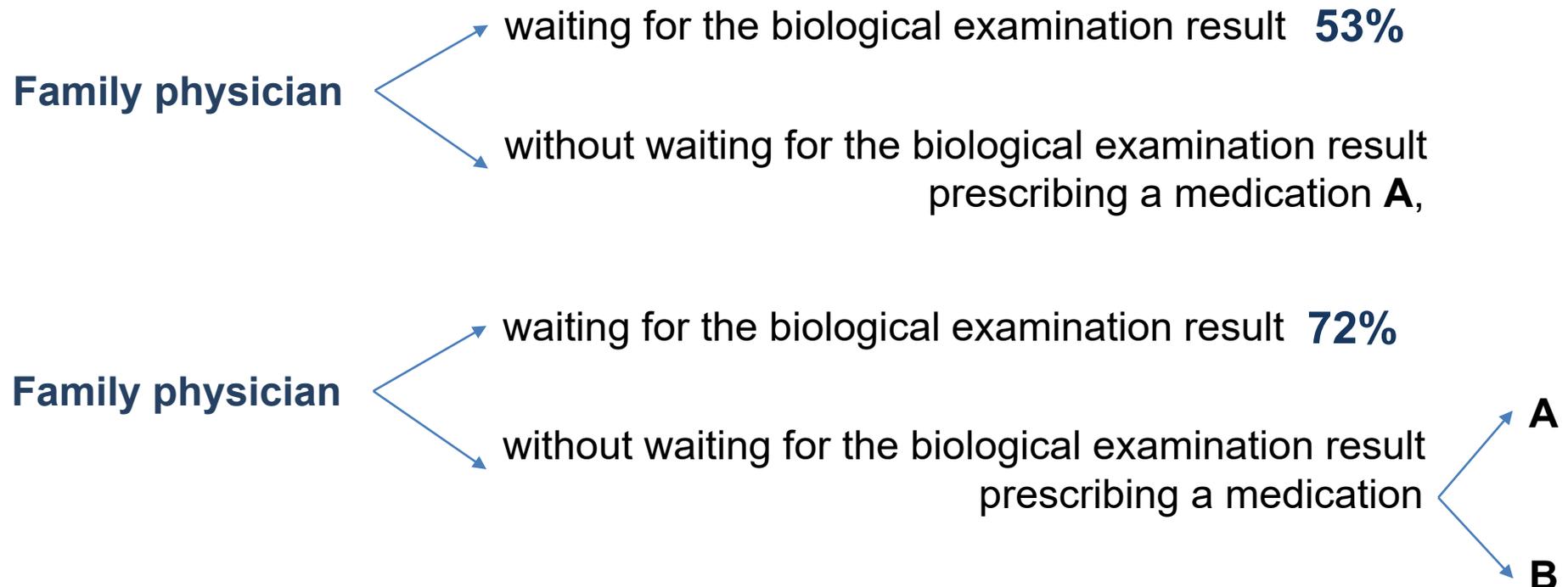
Offres moyennes



# From Rule to Frame

*Medical decision making in situations that offer multiple alternatives Redelmeier D., Shafir E. (1995)*

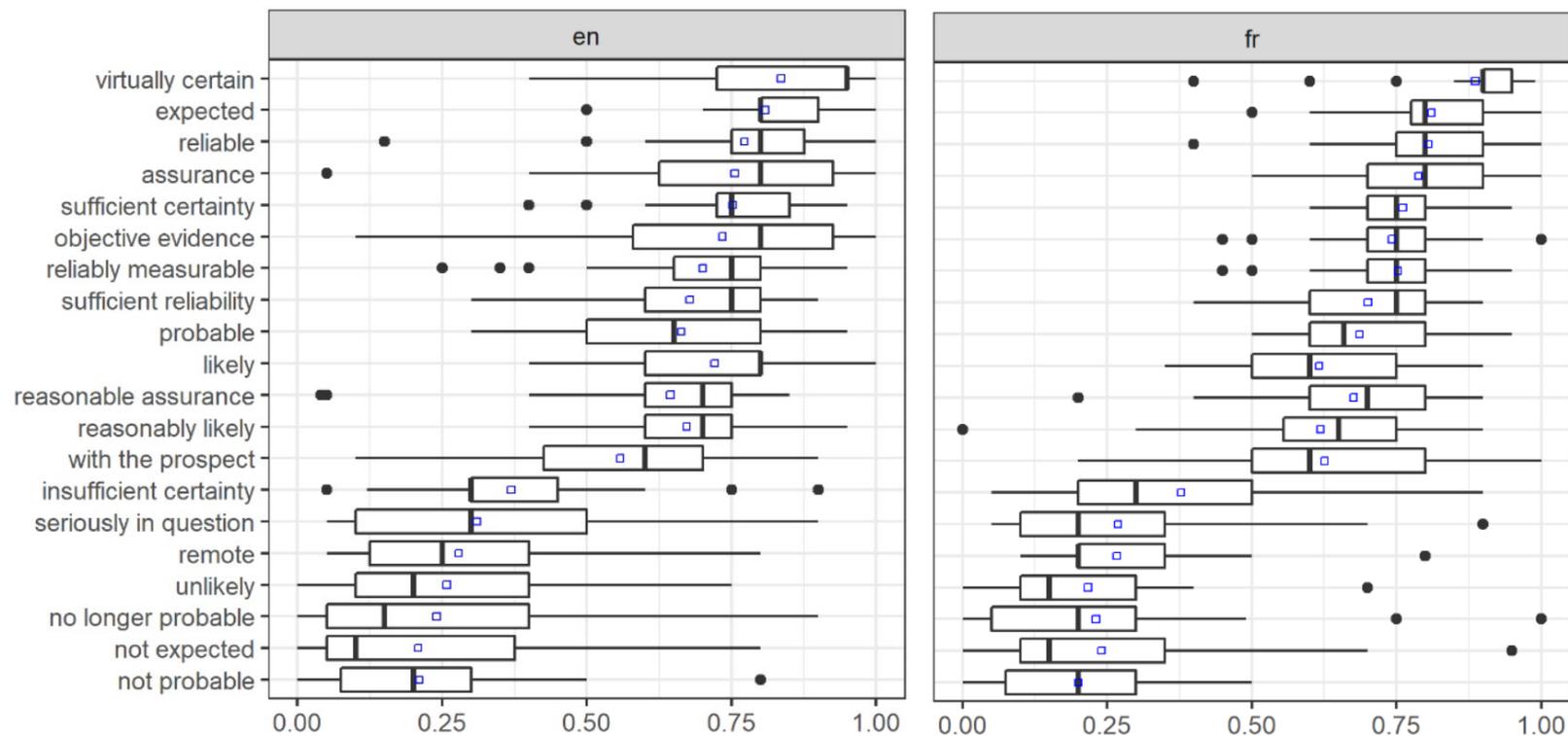
## Concerning patients with osteoarthritis...



Family physicians **were less likely to prescribe a medication when deciding between two medications than when deciding about only one medication.**

# From Rule to Frame

*V. Blum, P. Théron, D. Alexander, E. Laffory et S. Jancevska(2018).*



# Relevant or Irrelevant Frame

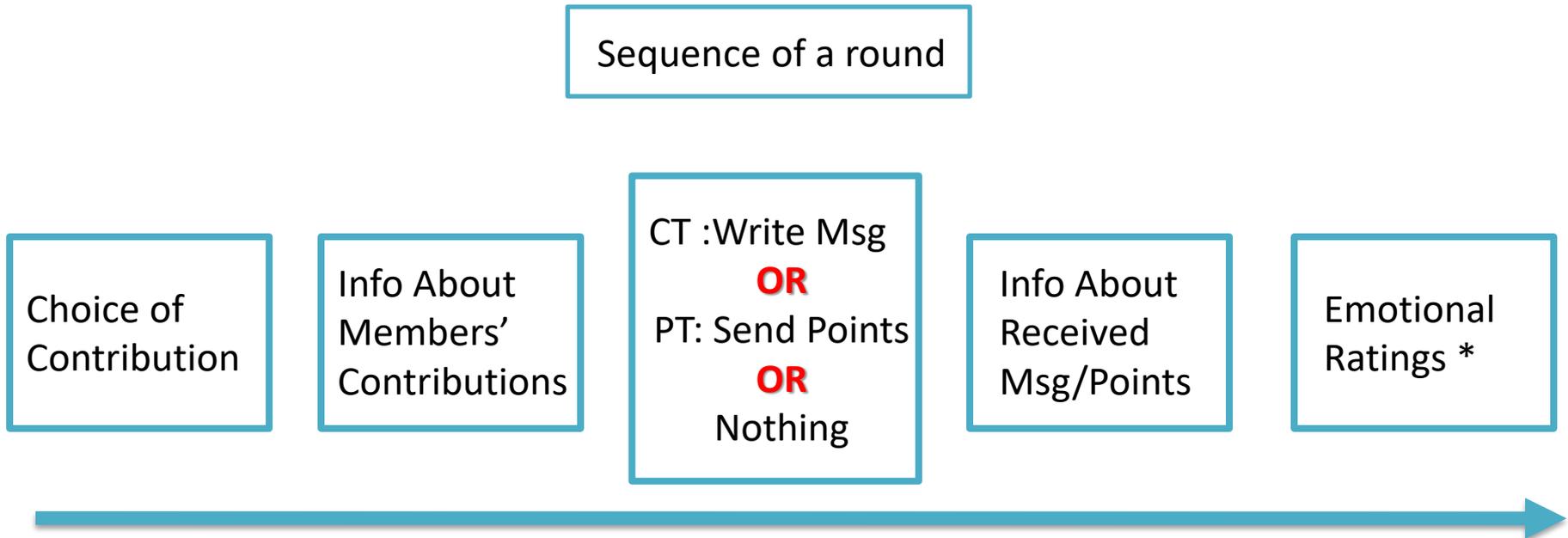
*B. Pelloux, J.L. Rullière and F. Van Winden (2016)*  
*Nature of Feedback Designs in Public Good Game*

- The First Phase: The Public Good Game (**Baseline Treatment: BT**)
  - Groups of 4 persons
  - Endowment of 20 tokens either to allocate between private and public good
  - Each token kept for yourself gives you 1 ECU (Experimental Currency Unit)
  - Each token allocated to PG gives 0.4 ECU to everybody in the group

$$earning_i = (20 - t_i) + 0.4 \cdot \sum_{j=1}^4 t_j$$

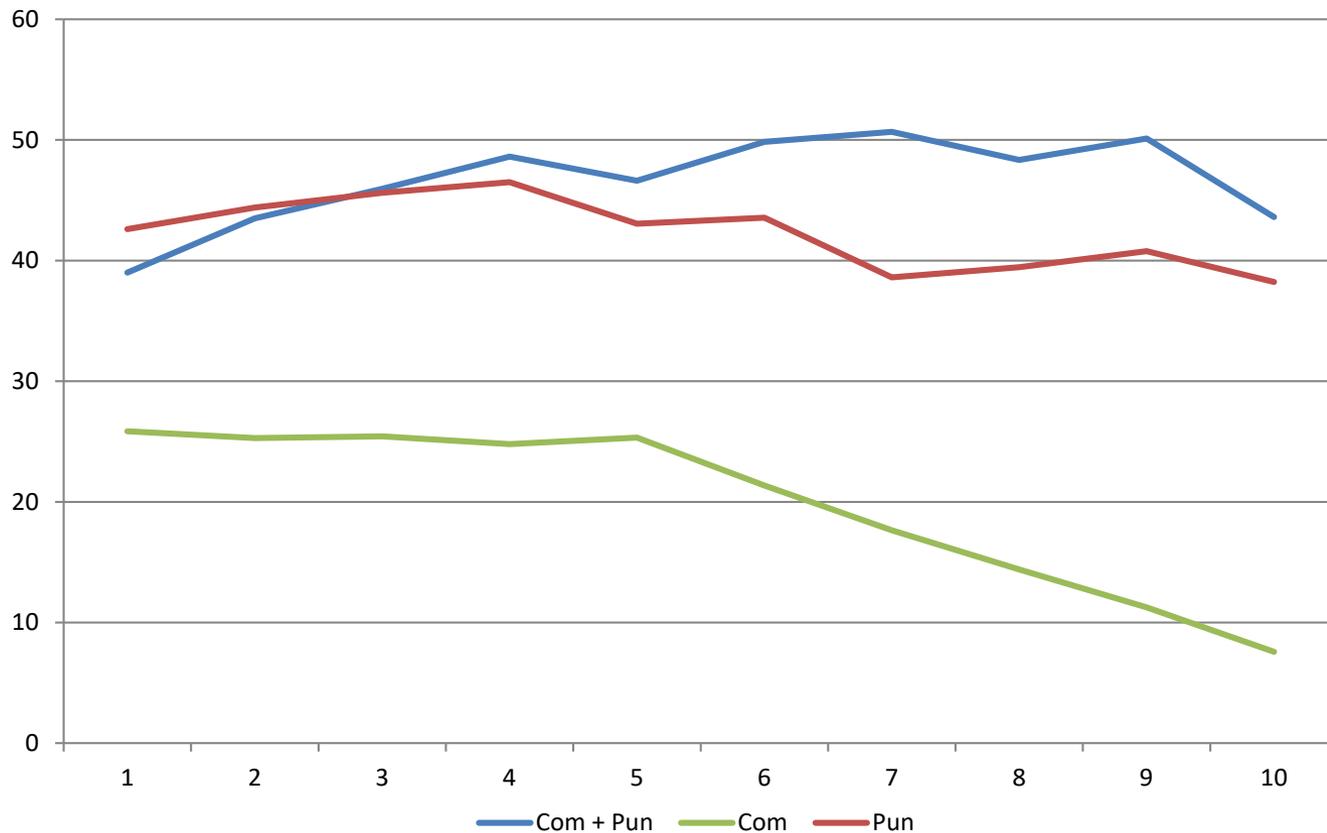
- The Second Phase: Feedback
  - You can **send** (or **not**) an individualized message to every member of your group (**Communication Treatment: CT**)
  - You can **destroy** (or **not**) a proportion (from 0 to 100%) of the payoff of each member of your group at a cost for yourself (**Punishment Treatment: PT**)
  - You can **send** or can **destroy** or **not** : (**Mixed Treatment: MT**)

# Relevant or Irrelevant Frame



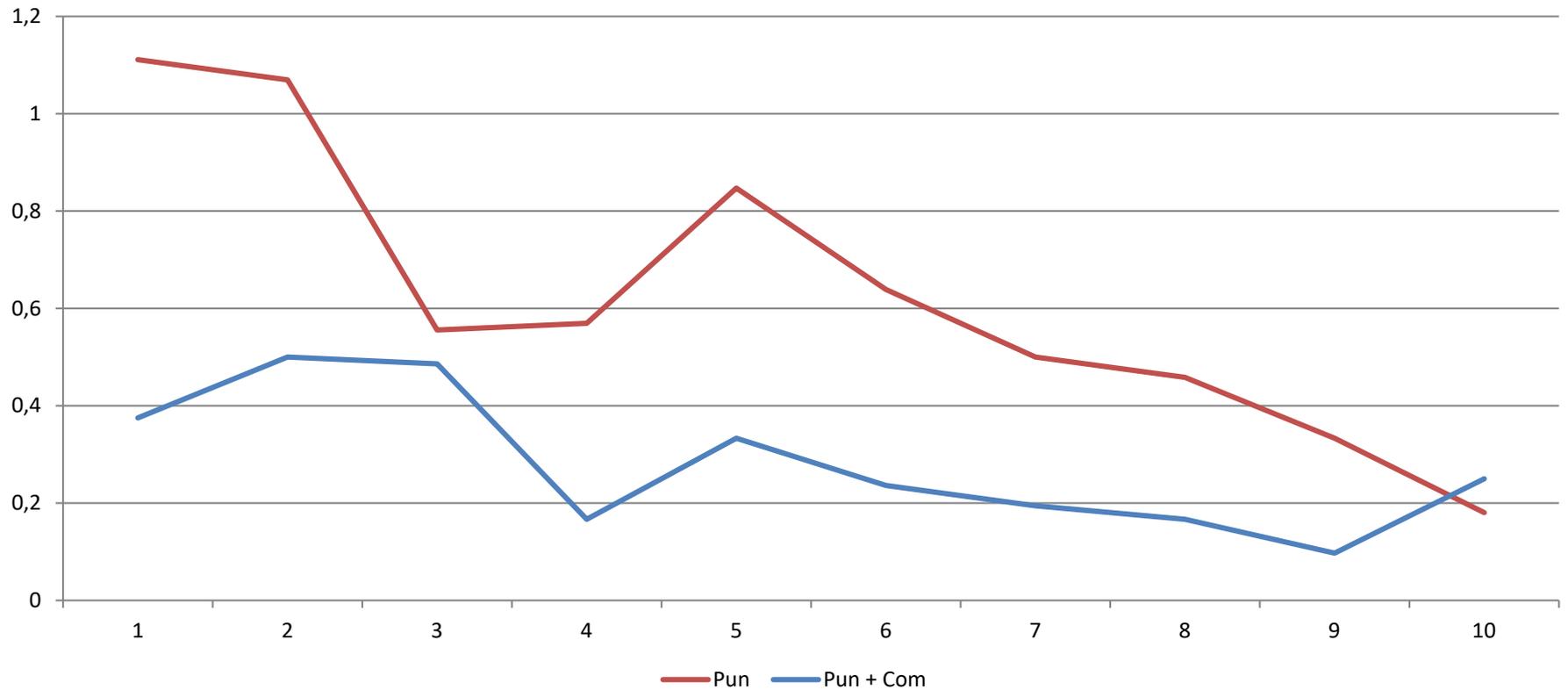
# Relevant or Irrelevant Frame

## Contribution Behavior



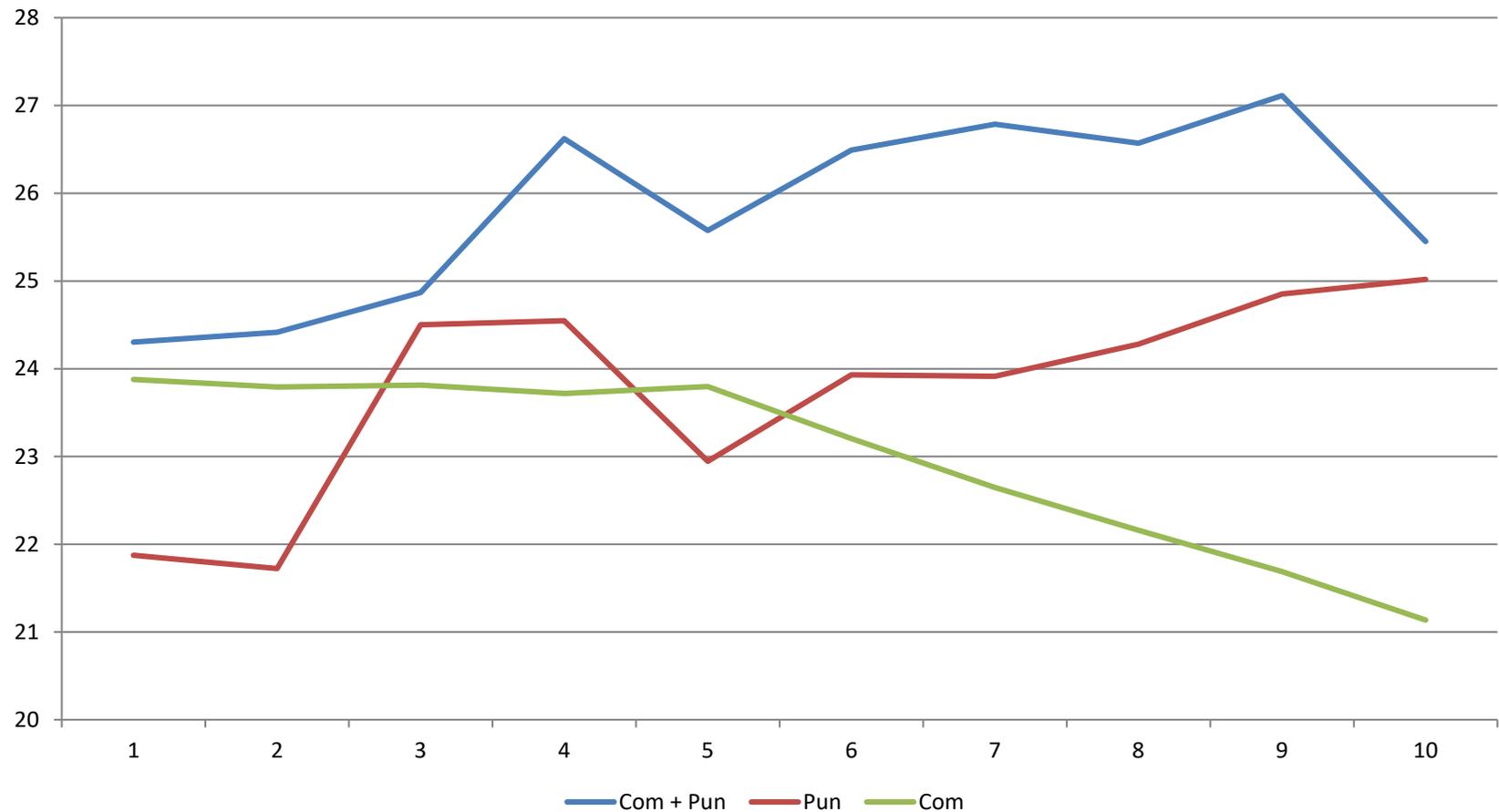
# Relevant or Irrelevant Frame

## Punishment Decision



# Relevant or Irrelevant Frame

## Efficiency



# Insurance Market Designs : Dynamics and Instability

## Rounds' parameters

- 4 Insurers offer 2 contracts each
- Each contract is composed of :
  - A *premium*: price of the contract
  - A *deductible*: paid in case of loss
- Insurance is compulsory

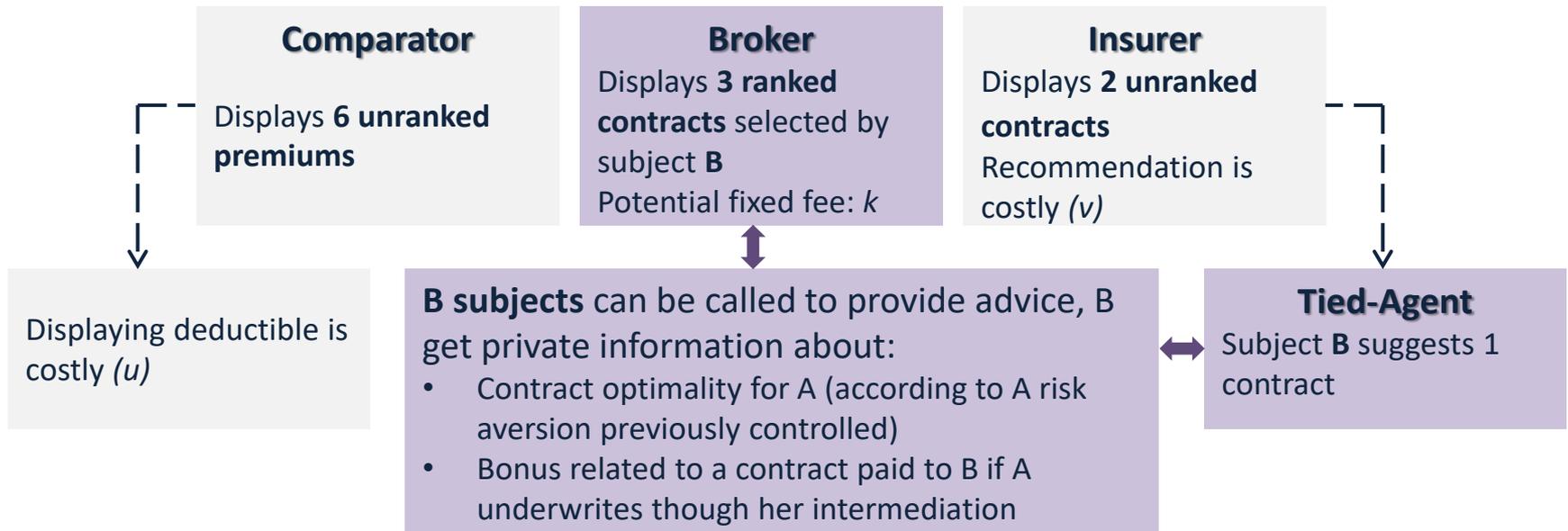
For each round there are:

- An initial wealth:  $W$
- A probability of loss:  $p$
- An amount of loss:  $L$
- A fixed Exploration Endowment:  $C$
- Fixed search costs:  $x, u, v$  ECU (calibrate under equivalent condition)

## Market Structure of the Experiment

A subjects can explore the market through different channels

Distribution channels choice is costly ( $x$ ) but shift is allowed as long as  $C$  is not saturated



# Insurance Market Designs : Dynamics and Instability

## Multinomial Logistic Regression including Panel specification

Dependant Variable: Rounds' Underwriting Channel

Referent Level: BROKER	Model 2		Model 4	
Coefficients	COMPARATOR	INSURANCE	COMPARATOR	INSURANCE
Std. Error				
Trust	0.01 <i>0.15</i>	0.06 <i>0.15</i>	0.24 <i>0.31</i>	0.53** <i>0.22</i>
Risk Aversion (R.A)	0.09 <i>0.09</i>	0.06 <i>0.09</i>	0.05 <i>0.13</i>	-0.18 <i>0.15</i>
Initial Wealth				
Loss				
Probability	0.94 <i>1.01</i>	0.83 <i>1.08</i>		
Round's First Choice - Comparator	5.48*** <i>0.41</i>	2.45*** <i>0.42</i>	3.76*** <i>1.21</i>	-0.83 <i>1.49</i>
Round's First Choice - Insurer	2.42*** <i>0.52</i>	5.40*** <i>0.49</i>	1.78 <i>1.33</i>	3.19*** <i>1.21</i>
Round's First Choice - Comparator X R.A			0.21 <i>0.25</i>	0.48* <i>0.29</i>
Round's First Choice - Insurer X R.A			0.11 <i>0.33</i>	0.29 <i>0.27</i>
Round's First Choice - Comparator X Trust			-0.58* <i>0.38</i>	-0.78** <i>0.36</i>
Round's First Choice - Insurer X Trust			0.01 <i>0.57</i>	-0.57 <i>0.46</i>
Constant	-2.20*** <i>0.66</i>	-2.31*** <i>0.67</i>	-1.42 <i>0.76</i>	-0.35 <i>0.79</i>
Nb Obs		1062		1062
Nb Subjects		177		177
R <sup>2</sup>		0.264		0.501
R <sup>2</sup> adjusted		0.254		0.494

- Inertia of choices
- Trusty subjects switch more for Brokers
- Risk Averse subjects firstly choosing comparator significantly change for Insurer

Signif. codes: p-value > 0.001: \*\*\*; p-value > 0.05: \*\*; p-value > 0.1: \*

# Conclusion

- Statistics to predict and to assess.
- Frames and rules are given and known
- Frame designs need to be tested : taking into account behavior
- Vernon L. Smith pioneered the use of controlled laboratory experiments as “wind tunnel” tests of new decision designs – for which precise theoretical predictions are hard to obtain – before they are used in practice
- Behavioral Economics and Reduction of Model Risk

**Thank you**