Information as an economic good – Information as a commons

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FIA Valencia Workshop

April 15, 2010

Let us play a game!

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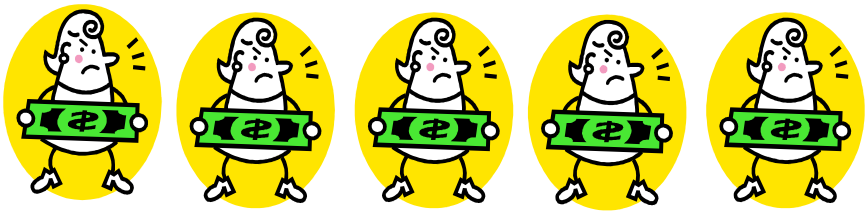
Let us play a game!

Group of 5 players (anonymous)

Each has 1 token (numbered ticket)



Please decide individually:

Contribute to

X = **private** account → Return of **3 for yourself**

Y = **public** account → Return of **1 for each player in group**

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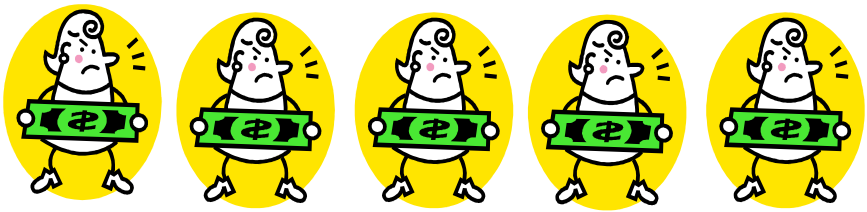
This is a public-goods game

Group of 5 players

Each has 1 token



Simultaneously and independently decide:

Contribute to

X = **private** account → Return of **3 for player self**

Y = **public** account → Return of **1 for each player in group**

Economic theory predicts free riding

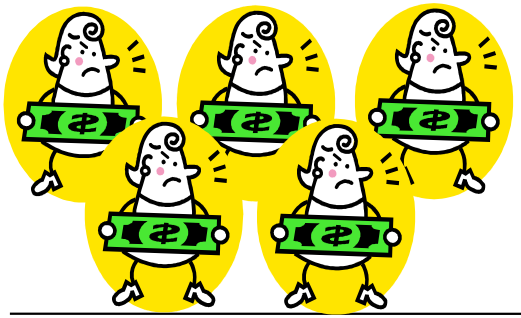
Paradigm of neoclassical economic theory: Economic agents are egoists seeking to maximize their individual material well-being

Nash equilibrium in public-goods game is in dominant strategies:

Contribute to **private account X**

(Individual payoff of 3)

↔ Efficient solution (group optimum):



Contribute to **public account Y**

(Individual payoff of 5)

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Why do people make voluntary public contributions?

Experimental economics (examines human behavior in controlled lab environments):

Recognize interest in cooperation, reciprocity is an important instrument to achieve this goal

Factors that can help to increase the contribution level

Identification of others, repeated interaction with same people, opportunity to communicate, opportunity to punish, opportunity for social exclusion etc.

The public-goods game may be considered a generalized prisoner‘s dilemma

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Roadmap

Classification of economic goods

Common pool resources

Information as a commons

Outlook

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Types of goods (Hess & Ostrom 2007, Ostrom & Ostrom 1977):

SUBTRACTABILITY (RIVALRY)

EXCLUSION	Low	High
Difficult		
Easy		

Samuelson 1954,
Musgrave 1959:
Public versus private good

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Types of goods (Hess & Ostrom 2007, Ostrom & Ostrom 1977):

		SUBTRACTABILITY (RIVALRY)	
		Low	High
EXCLUSION	Difficult		
	Easy		**Private goods** Personal computers Doughnuts

Competitive markets: invisible hand, price mechanism, self-centered individual behavior leads to social efficiency

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Types of goods (Hess & Ostrom 2007, Ostrom & Ostrom 1977):

Underprovision, free riding

EXCLUSION	SUBTRACTABILITY (RIVALRY) Low	High
Difficult	**Public goods** Useful knowledge Sunsets	
Easy		**Private goods** Personal computers Doughnuts

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Types of goods (Hess & Ostrom 2007, Ostrom & Ostrom 1977):

EXCLUSION	SUBTRACTABILITY (RIVALRY): Low	SUBTRACTABILITY (RIVALRY): High
Difficult	**Public goods** Useful knowledge Sunsets	**Common-pool resources** Libraries Irrigation systems
Easy	**Toll or club goods** Journal subscriptions Day-care centers	**Private goods** Personal computers Doughnuts

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The work by Elinor Ostrom

Field studies, theoretical modeling, laboratory experiments
Interdisciplinary research on

Common-pool resources (CPRs): natural or man-made resources where one person‘s use subtracts from another person‘s use and where it is often necessary but difficult and costly, to exclude others from using the resource (e.g., fisheries, grazing systems, water resources, broadcast spectrum etc.)

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"Tragicomedy of the commons"

-Mancur Olson 1965, The logic of collective action

Voluntary groups to achieve a shared goal

Free riding

-Garrett Hardin 1968, The tragedy of the commons

"Freedom in the commons brings ruin to all", over-exploitation

Only two solutions: privatization or government invention

Au contraire, Monsieur Hardin! Hess & Ostrom 2007

-Prisoner's dilemma

Self-organization is possible

Groups that are able to organize and govern their behavior successfully are marked by the following design principles.

1. Group boundaries are clearly defined.
2. Rules governing the use of collective goods are well matched to local needs and conditions.
3. Most individuals affected by these rules can participate in modifying them.
4. The rights of community members to devise their own rules is respected by external authorities.
5. A system for monitoring member‘s behavior exists; the community members themselves undertake the monitoring.
6. A graduated system of sanctions is used.
7. Community members have access to low-cost conflict resolution mechanisms.
8. For CPRs that are part of larger systems: organization in multiple layers of nested enterprises.

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Information as a commons

Information (in its intangible form) as a **public good** (open access)

New digital technologies allow to capture the previously uncapturable

Information as a **common pool resource** that needs to be managed, monitored and protected to ensure sustainablility and preservation

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Information as a commons

Traditional CPRs: high subtractability, risk of overexploitation

Knowledge: network effects

- Jointly used resources, managed by groups of varying sizes and interests
- Require collective action, self-governing mechanisms, and social capital

Examples of peer production and related research questions

- **Motivation for voluntary contributions**

Open Source Software (OSS): Prestige, fun, learning etc.

YouTube, Flickr, Digg: attention (Bernardo Huberman & team)

- **Successful management (governance structures)**

Wikipedia (Viegas, Wattenberg, McKeon 2007)

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How will the coexistence of commons and the design of property rights evolve?

Information commons allow **innovation**, identification and allocation of knowledge, production of information for its own sake in decentralized, non-market production

On the other hand, there are industrial players attempting to restrict access to information and control its use through licensing, digital rights management technologies etc. (club goods)

Hybride production?

Prosuming?

Further questions to be addressed

- Economic value of information commons
- Potentially negative impacts on the market
- Governance models
- Role of reputation systems, trust
- Quality assurance
- Business models (e.g., complexity question, OSS)

- **Interdisciplinary research collaboration is needed!**