

When do markets work?

... and the magic of Welfare Theorems

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LEARNING



LEARNING

“We can know more than we can tell . . . ”

– Polanyi (1966)



HUMANS VERSUS MACHINE LEARNING



HUMANS VERSUS MACHINE LEARNING

*“Google cars don’t drive on road, they drive on maps . . .”
– saying in machine learning community*



GROUPS

Too many cooks spoil the broth *Many hands make work light*



WHAT IS ECONOMICS?

ECONOMICS

“One of the great intellectual achievements of modern economics has been to work out very precisely the circumstances under which decentralized systems of market exchange can produce results that are efficient, in the sense of improving the condition of every individual as far as possible whenever this can be done without harming someone else.”

Paul Seabright (2010)

OBJECTIVE OF THE GAME

Primary objective:

establish presence in cities
to supply power to the city
and earn revenue

Powering cities requires *power plants* and *resources*

Buy *power plants* in an *auction*

Buy *resources* in a *market*

LEARNING THE GAME

3 distinct environments:

- *Strategic Spatial Interactions* (Building cities)
- *Market interaction* (Resources market)
- *Playing the auction game* (Power plant)

MARKETS

What is a market?

in the game

in real life

AUCTION

What is an auction?

types of auctions in the real life

difference between *markets* and *auctions*

PRODUCTION

What is production process?

Properties of the production process?

in the game

in the real life

Role of upfront fixed cost in production process:

due to space (spatial aspects)

due to fixed proportion production function

WHAT IS A FIRM?

Outsourcing **versus** *producing in-house*

Current theories about firms

Boundaries of a firm

Internal sub-economies in large firms*

ROLE OF CONSUMERS

How does consumer determine their demand for goods?

- Consumer's preferences
- Consumer's Budget

EFFICIENCY

What is efficiency?

*... can't make someone better off
without making someone worse off*

... no unexploited surplus left behind

WELFARE THEOREMS

Competitive Markets lead to efficiency

Correct market outcome through lump sum redistribution

MARKET FAILURE

non-well behaved *consumer preferences*

non-well behaved *production problem*

externalities

MARKET FAILURE

Strategic interaction

information problems

complementarities

MARKET?

Radjou, Navi, Jaideep Prabhu, and Simone Ahuja (2012). Jugaad innovation: Think frugal, be flexible, generate breakthrough growth.

Jugaad innovation:

Mars Orbiter Project.

Reality (\$71M) cheaper than Fictionalised Reality (\$100M)

