The Use of Knowledge in Society

PRINCIPLES OF ECONOMICS (ECON 210)
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Introduction

This lecture is about evaluating the competitive equilibrium on the basis of how well it allocates an economy’s resources.

• Does the output in equilibrium produce the combination of goods that makes society as well off as possible?
  • Given its constraints. It is easy to say that everyone’s living standard should be increased without bound, but resources for producing goods are finite.

• Evaluate the equilibrium on the basis of maximizing social welfare.
  • Each person in the economy gets utility from their consumption.
  • The sum of the utility levels of all people in the economy is social welfare.
  • Does the equilibrium make this sum as large as possible?
The “benevolent dictator” or “benevolent social planner”

• A theoretical contrivance that defines how the economy would allocate resources to maximize social welfare.
  • Does not actually exist (though some political leaders have tried to personify the concept).

• The benevolent dictator/social planner is an imaginary agent that knows:
  • All information about individuals’ preferences: all buyers’ willingness to pay for all goods.
  • All knowledge of the technology for production of all goods, so all producers’ opportunity costs and reservation prices.

• Starting to seem apparent why it’s unrealistic to have an actual benevolent social planner?
What would the benevolent dictator do?

Easy.

Order that all goods be produced in such quantities that:

\[
\frac{\text{marginal utility of good } i}{\text{marginal utility of good } j} = \frac{\text{price of good } i}{\text{price of good } j} = \frac{\text{opportunity cost of producing good } i}{\text{opportunity cost of producing good } j}
\]

for every pair of goods, “i” and “j”.

- It means that, for all goods, the benefit (utility) of producing 1 more unit per $ of cost is equal.
- We could not increase social welfare by producing more of one good and less of another.
Friedrich August Hayek

• Economists have had a definition of social welfare and this criterion for maximizing it for decades.
• F.A. Hayek shed light on the problem an economy confronts when trying to organize economic activity to accomplish this goal.
Hayek’s contribution

• Although all the necessary information exists, it is not given to any one agent in totality,
  • i.e., there is no benevolent social planner.
• How to overcome this problem of communicating information to other agents who must act on it?
The use of knowledge in society

- Which strategy of planning economic activity is more efficient ("better") at using the knowledge society has?
  - Central planning?
  - De-centralized planning?

- The nature of "knowledge": specific to time and space. Everyone has some niche where he is more familiar with available resources and potential uses than other agents.

- So how to go about "publicizing" this information?
  - Is it practical to invest in cataloging and accumulating it all in a centralized "encyclopedia"?
    - Then make all the decisions by looking up the information in the "encyclopedia".
  - Depends on how often changes to the specifics occur . . . .
Knowledge

• If conditions change frequently, revising an “encyclopedia” wastes a lot of effort and time.
  • Is it ever accurate? For how long?

• If conditions never change . . . maybe there is a case for central planning?

• But it is almost surely the former:
  • dynamic, evolving, too volatile to accurately and thoroughly keep in one volume.

• Too dynamic, fast-changing to act intelligently upon, except by the “man on the spot” (p. 524).
Knowledge

• The “man on the spot” needs information from others, cannot make intelligent decisions purely on his own specific information.

• How much does he need?

• Answer: he only needs to know how much more/less urgently needed are:
  • The resources at his disposal
  • The resources he needs for his production.
Prices: “signals wrapped in incentives”

• A price increase does not communicate to the buyer why he ought to economize on a good. Merely that the good has become more scarce and some of its marginal uses must be foregone (or substitutes found).
  • It could be a supply decrease or a demand increase, but the reason, to an individual buyer, is unimportant.

• Prices communicate information to the “man on the spot” very economically. They tell agents what they need to know and only what they need to know to allocate resources to their most important uses.
  • Again, from the social welfare notion of “important”.
To quote Hayek,

“The whole acts as one market, not because any of its members surveys the whole field, but because their limited individual fields of vision sufficiently overlap so that through many intermediaries the relevant information is communicated to all.” (p. 526)
The price system

• An under-appreciated function of the price system is revealed: communicating information.

• Crucially, observe how little each agent must know about the overall plan in order to act in society’s interest.

  “The marvel is that in a case like that of a scarcity of one raw material, without an order being issued, without more than perhaps a handful of people knowing the cause, tens of thousands of people whose identity could not be ascertained by months of investigation, are made to use the material or its products more sparingly, i.e., they move in the right direction.” (p. 527)

• Reminiscent of Adam Smith’s simile, “the invisible hand”.

Altruism

- The price system requires individuals to behave altruistically.
- This comes as a surprise to some.
Altruism

• Maybe because altruism, in the familiar sense, means actions that have “. . . perceivable favorable effects on particular other persons . . . .”* (emphasis added)

• The signaling of prices encourages people to get resources to those that value them the most, which is a favorable effect to be sure.
  • But hardly perceivable to each individual, who can “. . . no longer know whose needs his efforts do or ought to serve . . . .”

• “. . . we can still call [each individual’s] motives altruistic . . . not because he aims at or intends to serve the concrete needs of others, but because he observes abstract rules . . . No longer the end pursued but the rules observed make the action good or bad.”

Summary

• The price system efficiently communicates information, enabling the coordination of many agents’ decisions about allocating resources.
  • The technical term for it is general equilibrium.

• It overcomes the problem of decentralized, specific information.
  • Since its introduction at the beginning of the modern era, decentralized planning, what Hayek calls simply “competition”, has unanimously made better use of society’s knowledge than centralized planning.
  • By giving each individual an incentive to respond to prices, competition has enabled division of labor and advances in the efficient use of resources which have made modern civilization possible.
You might be an economist if . . .

- . . . you get chills when you think about this feature of competitive general equilibrium.

- **Vernon Smith** (pictured) won the 2002 Nobel prize in Economics for inventing the field of experimental Economics.

- Which he did while he was a professor at Purdue in the 1960s.
Smith summed it up like this . . .

“At the heart of economics is a scientific mystery: How is it that the pricing system accomplishes the world’s work without anyone being in charge?

. . . None of us could have invented it, and its operation depends in no way on anyone’s comprehension or understanding of it . . .

The pricing system—how is order produced from freedom of choice?—is a scientific mystery as deep, fundamental and inspiring as that of the expanding universe or the forces that bind matter.”*

Speculation

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Speculation links present and future markets

• Markets for a good today and the same good in a future time period are separate.

• If the good is not perishable, it can be stored (or production delayed) until the later period.

• Supply shifts inward in the present and outward in the future.
Why would sellers do this?

• If they expected the price to be higher in the future!

• This is speculation. It links the present and future markets for the same good.
  • Withholds the good from the market today until when the price is higher.

• Advantages:
  • Prices are smoothed out over time.
  • Goods are shifted to more valuable uses. They would go toward uses low on the demand curve if they had to be used today, but they satisfy uses that are higher on the demand curve in the future.
Price differences over time
Shifting goods to higher value uses
Speculation is not a dirty word

• If speculators are right about the future price, they perform a valuable function by shifting supply.
  • Some critics ignore the good speculators do and focus only on their role in raising the price in the present.

• Plenty of speculators are wrong, but when they are they pay for it and lose money.
  • They have every incentive to act only when they really believe their expectations are accurate.
  • They have to “put their money where their mouth is”.
Futures contracts

• A mechanism for speculating. A futures contract is a binding agreement to buy a good at a future time and at a price agreed upon in the present.
  • E.g., I enter a “lean hogs” futures contract that obligates me to buy 1,000 pounds of pork in 6 months at a price of $0.97 per pound. This is the price of the futures contract today.

• Between now and 6 months from now, the price of $0.97 per pound may change.
  • If it goes up, my contract begins to look pretty sweet.
  • If it goes down, I start to feel foolish.
  • Whatever the price is 6 months from now determines the profitability of my speculation. If the price is $1.00, I earn $30. If it’s $0.90, I lose $70.
What I do not do is take possession of 1000 pounds of pork. That goes to the food processing plant that can actually use that much pork. And it comes from the slaughterhouse that slaughtered pigs according to the price they observed in the futures market.

- The eventual buyers of the hogs also participate in the futures market as “hedgers”, acquiring futures such that they keep their costs stable over time.
- Participation by speculators, that settle their contracts in cash, acts as price insurance for the hedgers.

By the time of delivery, all the contracts find their way into the hands of buyers that will actually take delivery of the commodity.

- The process of trading in futures markets is more complex than I have described here.
- One of the better accounts of how to actually go about it is published by the National Futures Association, a regulatory group.
What futures prices tell us

• Depending on the commodity, futures markets that extend far into the future, i.e., several years (oil is an example), or only a few months (rice is an example).

• Each future date ("month") has its own price today.

• What does the trajectory of future prices tell us?
  • Upward trend over time: "contango". Price in the future is expected to be higher.
  • Downward trend: "backwardation". Price in the future is expected to be lower.
  • Lean hogs futures exhibit (next slide) a period of contango through summer 2014 followed by backwardation (fall 2014).
Futures markets: signals about future prices

Lean Hogs Futures, as of 3/3/15

- Cents per lb.
Signal watching

• Futures markets can be quite informative if the prices are interpreted using simple economic theory.

• (expectations of) Future price increases could reveal a demand increase or a supply decrease. The result of an expected:
  • Weather event (drought, early frost, et al.)?
  • Legal event, e.g., enactment of a mandate that more crops be used to produce ethanol?
  • Political event, e.g., war, trade embargo, et al.?

• Futures markets are so informative because speculators have strong incentives to be right about the future.
  • “Official” forecasts issued by economists or government agencies don’t have similar “skin in the game”.
Futures prices and information

• Futures markets and prediction markets (in which participants “bet” on future events without buying or selling goods) attract information about the future by rewarding speculators for accurate predictions.
  • Election outcomes,
  • Movie ticket sales,
  • The number of iPhone apps that will be downloaded.

• Many agents in the economy can benefit from the signals these markets generate.
  • Even those that do not buy or sell predictions. Knowing what the “wisdom of the crowd” is on a given subject helps everyone make better plans.

• The more speculative markets we have, the more publicity we have of these valuable signals.
Conclusion

• Markets efficiently attract the information possessed by individuals throughout the economy.

• Prices signal which goods are scarce and should be produced in greater numbers.
  • In the intertemporal context, futures prices signal when goods should be shifted from the present to the future or vice versa.

• Economies are dynamic and circumstances change often, so the (decentralized) price system greatly exceeds centralized planning as a method for allocating resources to their most valuable uses.

• Speculative markets increase an economy’s capacity to use resources to maximize social welfare.

• Speculation is like a bet.
  • “Overall, I am for betting because I am against bulls***. Bulls*** is polluting our discourse and drowning the facts. . . A bet is a tax on bulls***, and it is a just tax, tribute paid by the bulls***ters to those with genuine knowledge.” – Tyler Cowen