information & economics

concepts of information

April 8, 2010
why economics?

information age/economy
who owns information
law, library science, philosophy, economics?

information rules
why economics?

information age/economy
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law, library science, philosophy, economics?

information rules
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information age/economy

who owns information

law, library science, philosophy, economics?

information rules
so what are we talking about

"we use the term very broadly to mean anything that can be
digitized." --Shapiro & Varian

basic results [of information theory] are aimed in a very specific
direction ... not necessarily relevant to such fields as
psychology, economics, and other social sciences." --Shannon, "Bandwagon Effect"

"When there is uncertainty, there is usually the possibility of
reducing it by the acquisition of information. Indeed,
information is merely the negative measure of uncertainty." --
Arrow, "Information & Economic Behavior," 1973
the Summers dodge?
why economics?

information age gurus?
why economics?

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*"veritable rock-star economist"
why economics?

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*“veritable rock-star economist”
why economics?

"But the notion that somehow my views on regulation were predominant and effective at influencing the Congress is something you may have perceived. But it didn’t look that way from my point of view."

Alan Greenspan, testimony, 4/7/2010

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**information dilemmas**

information & practice
[NYT] until now, has had three economics columns. Economic Scene was written by economists: it rotated between Tyler Cowen, Austan Goolsbee, Robert Frank, and Hal Varian. Economic View was written by journalists, including Daniel Altman, Dan Gross, and Louis Uchitelle. Finally, Times staffer David Leonhardt had his own Wednesday column, Economix.

Today, all that changed. This is not good news for economic discourse in the mainstream press.

**econopundits**

*New York Times*: Paul Krugman

*New York Times*: “the economic scene”

*New Yorker*: Malcolm Gladwell

*New Yorker*: James Surowieki

*The Wisdom of Crowds*

**econoblogging:**

Brad deLong, Tyler Cowan, Matthew Yglesias, Marginal Revolution, Crooked Timber ...
"Caplan is the sort of economist (are there other sorts? there must be) who engages with the views of non-economists in the way a bulldozer would engage with a picket fence if a bulldozer could express glee."

**economics argument & contrarian glee**

Steven Leavitt & Stephen Dubner, *Freakonomics*, 2006  
Superfreakonomics, 2009

lest we forget

freedom, free information & the free market

Lou Rosetto, MBA
Kevin Kelly
Chris Anderson
... Esther Dyson
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economics and academia

Wresting the Economic Debate Away from the Economists

9:00 AM Wednesday March 31, 2010 | Comments (11)

David Brooks wondered in his New York Times column last week if economists shouldn’t try to become more like historians. That was interesting to read, given that I had just spent time with a bunch of historians (and a few other humanities professors) who were wondering how they could become more like economists.
"Economics is far more versatile than its critics believe. It is a method of analysis and not just a field of study. The method is to combine two core assumptions—individual optimization and equilibrium—with various sets of specific assumptions adapted to different fields of application. The method is applicable not only to the market system but also the social and political environment within which this system is embedded. Social and psychological insights can be encapsulated in the specification of interdependent preferences, which hold the key to modelling all kinds of institutional behavior in rational terms."

Buckley & Casson. "Economics as an imperialist social science" 1993
"Economics is not only a social science, it is a genuine science ... refutable implications. ... By almost any market test, economics is the premier social science. The field attracts the most students, enjoys the attention of policy-makers and journalists, and gains notice, both positive and negative, from other scientists. In large part, the success of economics derives from its rigor and relevance as well as from its generality. The economic toolbox can be used to address a large variety of problems drawn from a wide range of topics."

E.P. Lazear, "Economic Imperialism," 2000
attractiveness

broad explanatory power

robust modelling

mathematically tractability

whiggish history
- Mandeville's "harlot & highwayman"
- progress: rising height, weight, gdp

pareto efficiency

predictable future
"the competitive model virtually made economics a branch of engineering" -- Stiglitz

self-regulating systems

information as feedback
a field in step

broad explanatory power
political economy to economics
robust modelling
law and economics
mathematically tractability
whiggish history - pareto efficient
academic consensus
progress: rising height, weight, gdp
self-regulating systems
cyber - ...
academic consensus
predictable future
rationality
marketing consensus
"economics as a branch of engineering"
-- Stiglitz
modelling consensus
"do the math"
the decline of "high-development theory"
The procession of technological discoveries is inevitable. When the conditions are right – when the necessary web of supporting technology needed for every invention is established – then the next adjacent technological step will emerge as if on cue. If inventor X does not produce it, inventor Y will. ... the paths of technologies are inevitable. They are 1) that quantifiable trajectories of progress don't waver despite attempts to shift them (see my Moore's Law).

-- Kevin Kelly, 2009
"Contrary to popular claims, it appears that the common versions of Moore's Law have not been valid during the last decades. As semiconductors are becoming important in economy and society, Moore's Law is now becoming an increasingly misleading predictor of future developments...

"True innovation, however, is not predictable. It requires that we remember our history so that we are not doomed to repeat it."

Ilkka Tuomi, "The Lives and Death of Moore's Law," 2002
Twitter Predicts the Future

The chatter in Twitter can accurately predict the box-office revenues of upcoming movies weeks before they are released. In fact, Tweets can predict the performance of films better than market-based predictions, such as Hollywood Stock Exchange, which have been the best predictors to date.

The Social Computing Lab at HP Labs in Palo Alto, CA found that using only the rate at which movies are mentioned could successfully predict future revenues. But when the sentiment of the tweet was factored in (how favorable it was toward the new movie), the prediction was even more exact. To quantify the sentiments in 3 million tweets the team used the anonymous human workers found by the Amazon Mechanical Turk to rate a sample of tweets, and then trained an algorithmic classifier to derive a rating for the rest.
hesitations

goodhart not moore?

herd behavior
hesitations

goodhart not moore?

herd behavior
lest Surowieki forgot

Mississipi Scheme
South-Sea Bubble
Tulipomania
...
Dot.com boom?
...
sub-prime mortgages

MEMOIRS
OF
EXTRAORDINARY POPULAR DELUSIONS
AND THE
Madness of Crowds.

By Charles Mackay, LL.D.

Author of "Rouxia," "The Salamandrine," etc.

1852
end of empire?

a field in crisis?
freshwater vs saltwater

old rebels
Stiglitz, new Keynesians

new rebels
Greenspan?
Posner??

marginal or purged?
behaviorists

marxists
Richardson?
end of empire?

or endurance

Zombie economics --John Quiggin

"The ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed the world is ruled by little else. Practical men, who believe themselves to be quite exempt from any intellectual influences, are usually the slaves of some defunct economist."

--Keynes
just like bloggers?

"More often than not, what seems to happen is that economists form a belief on the basis of the qualitative evidence and theoretical frameworks, and then amass whatever statistical evidence they can to support it."

"The word communication will be used here in a very broad sense to include all the procedures by which one mind may affect another. This, of course, involves not only written and oral speech, but also music, the pictorial arts, the theatre, the ballet, and in fact all human behavior ... one which would include the procedures by means of which one mechanism (say automatic equipment to track an airplane and to compute its probable future positions) affects another mechanism (say a guided missile chasing an airplane)."

"The image of literature to be found in ordinary culture is tyrannically centred on the author ... ."

Roland Barthes

"I do not, like a jure divino Tyrant, imagine that [readers] are my slaves or, my commodity."

Henry Fielding, Tom Jones

"a range of views?"
"While there is a single way in which information is perfect, there are an infinite number of ways in which information can be imperfect."

Stiglitz
economics & information

coming into a discipline
Adam Smith
"the real interests of the servants is by no means the same with that of the country, and the most perfect information would not necessarily put an end to their oppressions"

Thomas Malthus
"the nerves which carry the information of [pain] to the brain"
Alfred Marshall

"Perfectly reflex actions, such as that of breathing during sleep, are performed by the responsibility of the local nerve centres without any reference to the supreme central authority of the thinking power, which is supposed to reside in the cerebrum.

But all deliberate movements require the attention of the chief central authority: it receives information from the nerve centres or local authorities and perhaps in some cases direct from the sentient nerves, and sends back detailed and complex instructions to the local authorities, or in some cases direct to the muscular nerves, and so co-ordinates their action as to bring about the required results"
so to Hayek

1889-1992

self-regulation
The Road to Serfdom, 1944

The Fatal Conceit, 1988

knowledge & information
“Economics and Knowledge”, 1937
“The Use of Knowledge in Society”, 1945
Hayek, 1937
"Clearly there is here a problem of the division of knowledge which is quite analogous to, and at least as important as, the problem of the division of labour. ... instead of showing what bits of information the different persons must possess in order to bring about the result, we fall in effect back on the assumption that everybody knows everything"
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"Economics has come nearer than any other social science to an answer to that central question of all social sciences, how the combination of fragments of knowledge existing in different minds can bring about results which, if they were to be brought about deliberately, would require a knowledge on the part of the directing mind which no single person can possess."
Hayek, 1937
"... the spontaneous actions of individuals will under conditions which we can define bring about a distribution of resources ... as if it were made according to a single plan"
"... the spontaneous actions of individuals will under conditions which we can define bring about a distribution of resources ... as if it were made according to a single plan"

"equilibrium analysis ... seems to have so extraordinarily little to say about the institutions, such as the press, the purpose of which is to communicate knowledge. ... a peculiar blindness to the rôle played in real life by such institutions as advertising"
Hayek, 1945
"If we possess all the relevant information, if we can start out from a given system of preferences and if we command complete knowledge of available means ..."
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"a problem of the utilization of knowledge not given to anyone in its totality"
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"a problem of the utilization of knowledge not given to anyone in its totality"

"If it is today so widely assumed that [the expert] will be in a better position, this is because one kind of knowledge, namely, scientific knowledge, occupies no so prominent a place in public imagination"

"A body of suitably chosen experts may be in the best position to command all the best knowledge available--though this is of course merely shifting the difficulty to the problem of selecting the experts"
"almost heresy to suggest that scientific knowledge is not the sum of all knowledge. But ... a body of very important but unorganized knowledge which cannot possibly be called scientific in the sense of knowledge of general rules ..."
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"... practically every individual has some advantage over all others in that he possesses unique information of which beneficial use might be made"
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"... practically every individual has some advantage over all others in that he possesses unique information of which beneficial use might be made"

"economists who regard themselves as definitely above the crude materialist fallacies ... commit the same mistake [of prejudice] toward the acquisition of such practical knowledge ... because in their scheme of things such knowledge is supposed to be 'given'"
perfect information?
perfect information?

efficient market hypothesis
perfect information?

**efficient market hypothesis**

"the price system ... a mechanism for communicating information"
perfect information?

**efficient market hypothesis**

"the price system ... a mechanism for communicating information"

"in a system where knowledge of the relevant facts is dispersed among many people, prices can act to coordinate the separate actions"
perfect information?

**efficient market hypothesis**

"the price system ... a mechanism for communicating information"

"in a system where knowledge of the relevant facts is dispersed among many people, prices can act to coordinate the separate actions"

"the unavoidable imperfection of man's knowledge and the consequent need for a process by which knowledge is constantly communicated and acquired"
perfect information?

**efficient market hypothesis**

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--Hayek
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--Hayek

"The adjustment of Stock Prices to New Information" --Eugene Fama, 1969
perfect information?  

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--Hayek

"The adjustment of Stock Prices to New Information" --Eugene Fama, 1969

a Dretskean view?
"One should hardly have to tell academicians that information is a valuable resource: knowledge is power"

George Stigler, “The Economics of Information,” 1961
von Neumann & Morgenstern
*Theory of Games*, 1944

JSTOR economic journals -- hits

"perfect information"

1880-1944  0
1945-1950  4

**backbearings?**

1952, Shubik, "Information, theories of competition, and the theory of games"
"imperfect information"
"As the market grows in these dimensions, there will appear a set of firms which specialize in collecting and selling information. They may take the form of trade journals or specialized brokers ... there is a strong tendency towards monopoly ... a 'standard' source for trade information".

--Stigler, "The Economics of Information"
"When there is uncertainty, there is usually the possibility of reducing it by the acquisition of information. Indeed, information is merely the negative measure of uncertainty. ... I will think rather of information as a general descriptive term for an economically interesting category of goods which has not hitherto been accorded much attention by economic theorists. ... economic behavior depends not only on the variables we usually regard as relevant, primarily prices, but also on signals which may themselves have little economic significance but which help reduce the uncertainty in predicting other as yet unobservable variables. ... [in equilibrium theory] the economic behavior of individuals is governed primarily by prices ... actual economic behavior is partly governed by nonprice variables." --Arrow, "Information & Economic Behavior", 1973
"Economy arises only if the signals transmitted are summaries of the information received . . . the costs of transmission are much lower than those of acquisition, and it is possible that joining the observers into a single organization can represent a net economy. ... Once learned, however, it is cheaper to reuse the same system than to learn a new one . . . If external conditions change, an originally optimal communication system may no longer be the one that would be chosen . . . . Eventually the communication system may be very inefficient at handling signals, and the firm may vanish." -- Arrow
"information as that which is being communicated becomes identical with 'knowledge' in the sense of that which is known"

Fritz Machlup, *The Production and Distribution of Knowledge*, 1963
"Chicago School ... one simply analyzed the special factors determining the demand for and supply of information, just as one might analyze the factors affecting the market for wheat."

--Stiglitz

"All the aspects of knowledge--its creation, its storage, its retrieval, its treatment as property, its role in the functioning of societies and organizations--can be (and have been) analyzed with the tools of economics. Knowledge has a price and a cost of production; there are markets for knowledge, with their supply curves, and marginal rates of substitution".

Herbert Simon,

"The many shapes of knowledge," 1999
continuing dissent?

"knowledge" is rarely reducible to information"

G.B. Richardson, 
*Information & Investment*, 1960

[or "the economics of imperfect knowledge"]
"by neglecting the whole problem of information, the perfect competition model condemns itself not only to unrealism but to inadequacy even as a hypothetical system"

--Richardson
[the idea of] “personal knowledge that is not readily transmitted as information [is a challenge to] virtually every construction of rational decision processes as the basis for modeling and explaining the behaviors of individual agents”.

Cowan, David, Foray, “The Explicit Economics of Knowledge Codification and Tacitness,” 2000
nihilistic acts

the Denning assumption

dissent from methodological individualism "implies that the behavior of men is directed by mysterious forces that defy analysis and description."


"Many resource-based theorists reject formal modelling altogether, and adopt the nihilistic stance that in a complex world any model of the firm will distort more than it illuminates."

asymmetrical information

“There is an incentive for sellers to market poor quality merchandise ... The difficulty of distinguishing good quality from bad is inherent in the business world. An asymmetry in available information has developed: for the sellers now have more knowledge about the quality of a car than the buyers ...Gresham’s law has made a modified reappearance."


market failure
influential

JSTOR economic journals -- hits
"asymmetric information"

1880-1970  0
1971-1980  13
but

what do we mean by full, im/perfect, in/complete, or a/symmetrical information?

and how do we perfect, complete, or make full or symmetrical?
information plugs a gap?

"I was struck by the imperfections of information ... asymmetries ... between those governing and those governed."

"peculiar implications of the model ... it seemed not to address issues such as incentives and motivation. But much of the research was directed not at these big gaps."

--Stiglitz
"it is hard to imagine what a world with perfect information would be like"

--Stiglitz
moving knowledge?

knowledge management
the HP conundrum
sticky vs leaky
resolution
a place for wisdom?

“We do not receive wisdom, we must discover it for ourselves, after a journey through the wilderness which no one else can make for us, which no one can spare us.”

Proust, *Within a Budding Grove*
moreover

"perfect information ... free, complete, instantaneous, and universally available ... [is] one of the defining features of the perfect market ... "

"at the same time, both the perfect and the actual market structure ... depend on information being a commodity, ... costly, partial, and deliberately restricted"

James Boyle, Shamans, Software & Spleen, 1996
back to the state

Society for the Distribution of Useful Knowledge

vs

Habermas

news as commodity vs news as informing the public sphere
and so to development
"somewhere in the world a new opportunity for the use of some raw material, say tin, has arisen ..."--Hayek, 1945

**spatial divisions**

**divisions of**

- commodities
- labor
- knowledge
The mechanical faculty of Lancashire is said to be due to the influence of Norman smiths who were settled at Warrington by Hugo de Lupus in William the Conqueror's time. And the greater part of England's manufacturing industry before the era of cotton and steam had its course directed by settlements of Flemish and other artisans; many of which were made under the immediate direction of Plantagenet and Tudor kings. These immigrants taught us how to weave woollen and worsted stuffs, .... They taught us how to cure herrings, how to manufacture silk, how to make lace, glass, and paper, and to provide for many other of our wants.

When an industry has thus chosen a locality for itself, it is likely to stay there long: so great are the advantages which people following the same skilled trade get from near neighbourhood to one another. **The mysteries of the trade become no mysteries; but are as it were in the air,** and children learn many of them unconsciously. Good work is rightly appreciated, inventions and improvements in machinery, in processes and the general organization of the business have their merits promptly discussed: if one man starts a new idea, it is taken up by others and combined with suggestions of their own; and thus it becomes the source of further new ideas. And presently subsidiary trades grow up in the neighbourhood, supplying it with implements and materials, organizing its traffic, and in many ways conducing to the economy of its material. -- Marshall
limits to localization?

Every cheapening of the means of communication, every new facility for the free interchange of ideas between distant places alters the action of the forces which tend to localize industries. Speaking generally we must say that a lowering of tariffs, or of freights for the transport of goods, tends to make each locality buy more largely from a distance what it requires; and thus tends to concentrate particular industries in special localities: but on the other hand everything that increases people's readiness to migrate from one place to another tends to bring skilled artisans to ply their crafts near to the consumers who will purchase their wares. --Marshall
cheaper and cheaper

regions of innovation
radio, television
oscillator, microprocessor
personal computer
ethernet, web
search
web 2.0

regional policy
market making or market interference
"human capital .. could be studied using the economic tools developed for objects"

"Must economic theory recognise a different kind of good--ideas--if it is to explain .. growth?... If there are only object gaps, the implications for poor countries are much more pessimistic than if there are also idea gaps"

--Romer
"Idea gaps, in contrast are relatively easy to solve. ... an important fraction of worldwide poverty may be due to an idea gap that can be reduced at relatively low cost. ... the world already possess the knowledge needed to provide a decent standard of living for everyone on Earth ... crucial pieces of specialized, highly trained human capital can be put to work domestically by inviting in managers and technicians." — Romer
the object gap disappears?

"Access... through unimpeded flows of the capital goods that are produced in industrialized nations."

..."absorption capacity ..."
disequilibrium?

- economic discourse
- communication theory
- economics and information/knowledge
- the place of information