

The Use of Knowledge in Society

F. A. Hayek

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Frederick Hayek's economy of knowledge

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A complex system, Herbert Simon wrote, is “made up of a large number of parts that interact in a non-simple way [such that] given the properties of the parts and the laws of their interaction it is not a trivial matter to infer the properties of the whole.” (Simon, 1969):267 Though economists rarely use the term, complexity has a long history in the field, most famously illustrated by Adam Smith's invisible hand. His surprising claim that competitive markets and private property could harness individual self-interest so as to contribute to a well-ordered society is exactly the far from trivial inference about the “properties of the whole” that he derived from the “parts and their laws of interaction” to which Simon referred.

In his “The Use of Knowledge in Society” Hayek provides what I take to be the best explanation of how the invisible hand might work: “We must look at the price system as ... a mechanism for communicating information if we want to understand its real function. ... The most significant fact about this system is the economy of knowledge with which it operates, or how little the individual participants need to know in order to take the right action.” A price, to Hayek, is both a message about the relative scarcity of a good and a motivation to adjust one's behavior to a change in that scarcity. This bundling of message and motivation is the key to how an emergent property of a market system could be what Hayek called a “rational economic order.”

The paper was one of Hayek's many contributions to the early 20th century debate on the economic feasibility of centralized planning and its merits and shortcomings relative to the capitalist economy. Ludwig von Mises, Hayek and others advanced the view that the rational economic calculation entailed by planning required the knowledge of prices reflecting true scarcity (that is, measuring social marginal costs and benefits), and this information could be obtained only by the extensive use of decentralized allocation through markets. Oskar Lange, Enrico Barone, Abba Lerner and others countered that prices are implicit in any optimizing problem (whether or not markets exist). Linear programming methods developed by Leonid Kantorovich in the Soviet Union in 1939 provided a method by which these prices could be

calculated. (Like Hayek's paper, Kantorovich's contribution reached far beyond academia. I taught linear programming to future economic planners in Havana in the late 1960s and used the technique to advise Cuba's Ministry of Sugar.)

By the 1940's the debate appeared to be over. Even the arch-opponent of socialism, Joseph Schumpeter, had conceded: "Can socialism work? Of course, it can. ...There is nothing wrong with the pure theory of socialism."(Schumpeter, 1942):167, 172.. He was echoing another opponent of socialism, Vilfredo Pareto. In a section of his famous *Manuel d'Economie Politique* labeled "An argument in favor of collectivist production," Pareto had concluded (Pareto, 1909):364 that "pure economics does not give us a truly decisive criterion for choosing between the organization of society based on private property and a socialist organization."

What then *was* wrong with central planning? And what was wrong with economic theory that it had so let down the market side of the debate? Hayek's paper was a counterattack against central planning, but he also targeted the "pure economics" that Pareto had referred to, meaning the equilibrium theory of perfect competition and the entire Walrasian (also termed neoclassical) paradigm in economics.

In Hayek's view, assuming a state of equilibrium effectively precludes a serious analysis of competition, which he defines, following Samuel Johnson, as "the action of endeavoring to gain what another endeavors to gain at the same time." He continues as follows:

Now, how many of the devices adopted in ordinary life to that end would still be open to a seller in a market in which so-called "perfect competition" prevails? I believe that the answer is exactly none. Advertising, undercutting, and improving ("differentiating") the goods or services produced are all excluded by definition—"perfect" competition means indeed the absence of all competitive activities. (Hayek, 1948)

But to Hayek, the problem with the conventional economic paradigm went considerably beyond these shortcomings of the concept of the perfectly competitive equilibrium. His more fundamental criticism was the failure to recognize that information is scarce and local. In this paper he recast the planning versus the market debate as a problem of information aggregation:

Which of these systems is likely to be more efficient depends on the question under which of them can we expect that fuller use will be made of the existing knowledge.

And this, in turn, depends on whether we are more likely to succeed in putting at the disposal of a single central authority all the knowledge which ought to be used but which is initially dispersed among many different individuals, or in conveying to the individuals such additional information as they need in order to enable them to fit their plans in with those of others.

Since the 1980s, the discipline has taken up the fact that information takes the form, as Hayek put it, of “dispersed bits of incomplete and frequently contradictory knowledge which all the separate individuals possess.” Figure 1 illustrates the explosion of interest among economists in the problem of limited information that Hayek raised in his 1945 paper (few cite Hayek, or even know that it was this 1945 paper that reframed the market as an information processing system).

What is termed “asymmetric information” now plays a central role in models of employment, credit, and the organization of the firm. The worker, for example, knows how hard she worked, but the employer does not; the lender knows how the loan will be actually used, the banker does not.

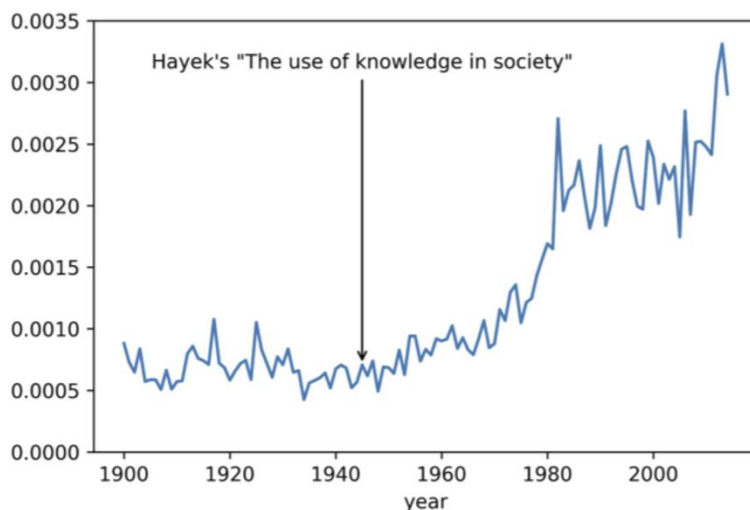


Figure 1. Frequency of the use of the words "knowledge" and "information" as a fraction of all words in the papers published in top economics journals AER, Econometrica, EJ, JPE, QJE, RESTAT, RESTUD [1900 - 2014]. The data on which this is based are described in Bowles and Carlin 2020.

As a result of these information asymmetries, contracts – for employment or lending, for example– will not cover everything of interest to the parties of the exchange. Hard work and prudent management of loaned funds are thus “external effects,” like environmental spillovers that thus escape the logic by which the invisible hand would work.

These models -- the first of which by Herbert Simon was published just 6 years after Hayek's paper -- address what Hayek termed "planning" within "organized industries" as well as the exercise of authority of owners and managers over their employees. Not surprisingly they show that the owners and managers of firms face the same intractable information problems and resulting inefficiencies that Hayek showed would plague a socialist central planner.

Ironically, Hayek's economy of knowledge brilliantly illustrates both how the invisible hand might work, and why in our economy of "organized industries" and "monopolies" facing planetary constraints, it would be a mistake to think that it does.

Works cited

Bowles, Samuel and Wendy Carlin. 2020. "What Students Learn in Economics 101: Time for a Change." *Journal of Economic Literature*, 58(1), 176-214.

Hayek, F.A. 1948. "The Meaning of Competition," *Individualism and Economic Order*. Chicago: University of Chicago Press,

Pareto, V. 1909. *Manuel D'economie Politique*. Paris (First Italian edition published 1905): Giard et Briere.

Schumpeter, Joseph. 1942. *Capitalism, Socialism, and Democracy*. New York: Harper & Row.

Simon, Herbert. 1969. *The Sciences of the Artificial*. Cambridge: MIT Press.