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Friedrich Hayek and the Price System

Remarks by

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at

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I am delighted to be back in New Haven and particularly to be in the company of so many students interested in thinking rigorously about ideas. And I am honored to be participating in the William F. Buckley, Jr., Program's conference today on Friedrich Hayek and the future of classical liberalism.¹

Over the course of this afternoon, you will hear a series of presentations that put Hayek's thinking in the context of contemporary developments and that offer a variety of perspectives on his intellectual legacy. Hayek was a prolific—some might even say profligate—thinker. He was at various times, and in various modes, an early neuropsychologist, an epistemologist, a theoretical economist, a political philosopher, a moral philosopher, a philosopher of science, a historian of ideas, a public intellectual, and a social polemicist. This vast range has caused some to undervalue his contributions as an economist, notwithstanding his eventual Nobel Prize—when Hayek moved to the United States in 1950, the University of Chicago Economics Department would not hire him because, as Milton Friedman said, “At that stage, he really wasn't doing any economics,” and Paul Krugman famously said that “the Hayek thing is almost entirely about politics, not economics.”² Others believe his broader thought, while seminal, was inconsistent across these various areas, and Hayek himself never demonstrated how it all hung together. In my contribution to the discussion today, I want to examine a particular example of the lasting effect that Hayek has had on economic thinking—one pertaining to the importance of freely determined prices for producing efficient economic

¹ All of my remarks today represent my own views, which do not necessarily represent those of the Federal Reserve Board, the Federal Open Market Committee, or the Financial Stability Board. I would like to thank Ed Nelson for his assistance in preparing these remarks.

² See, respectively, Cassidy (2000) and Krugman (2011).

outcomes—and consider how Hayek’s insights in this area can, in fact, tie together the various strands of his larger philosophy.

So as not to appear entirely out of touch with more immediate developments, I will end by descending from the empyrean to the terrestrial with a discussion of the economic outlook and the Federal Open Market Committee’s (FOMC) policy decision from earlier this week.

Hayek and Economics

Hayek’s contributions to economics ranged widely, and many were important and of lasting influence. Among them were his studies of the relationship between the economic and political arrangements of a society. That body of work included, of course, his celebrated book *The Road to Serfdom*, which was published 75 years ago this year and is a focus of this event, as well as his later monograph, *The Constitution of Liberty*.³ In addition, Hayek contributed prominently to monetary analysis. His work in this area included the theory of the business cycle that was part of the thinking of the Austrian school of economics.⁴ It also included Hayek’s studies of the feasibility and implications of private-sector currency issuance—contributions that have informed modern-day analyses of the repercussions of electronic money.⁵

Today, however, I will be concerned instead with still another key contribution that Hayek made to economic analysis: understanding the operation of the price system.

³ See Hayek (1944, 1960). For an extensive analysis of these books, see Caldwell (2004) and, more recently, Caldwell (forthcoming).

⁴ See, for example, Hayek (1935). For an examination of this body of work, see O’Driscoll (1977).

⁵ See especially Hayek (1976). For recent formal investigations of the topic, see Brunnermeier, James, and Landau (2019) and Fernández-Villaverde and Sanches (2019). My Board colleague, Lael Brainard, has recently discussed the policy implications of electronic money. See Brainard (2019). The potential implications of privately issued currency in the form of stablecoins are under active consideration by the Financial Stability Board, which I chair, in work to be delivered to the Group of Twenty later next year.

This contribution was formalized in his most famous paper in the economic-research literature: his article “The Use of Knowledge in Society,” which was published in the *American Economic Review* in September 1945.⁶

Hayek (1945) Revisited

It is worth outlining the basis for the high esteem in which economists hold Hayek’s 1945 contribution. In 1974, the press release by the Royal Swedish Academy of Sciences that announced Hayek’s Nobel Prize in Economics stated: “The Academy is of the opinion that von Hayek’s analysis of the functional efficiency of different economic systems is one of his most significant contributions to economic research in the broader sense. . . . His guiding principle when comparing various systems is to study how efficiently all the knowledge and all the information dispersed among individuals and enterprises [are] utilized. His conclusion is that only by far-reaching decentralization in a market system with competition and free price-fixing is it possible to make full use of knowledge and information.”⁷

In the research that the academy described, Hayek’s 1945 paper was the key article. More recently, this paper received further prominent acclaim when it was categorized by an expert panel as being one of the top 20 articles ever published in the *American Economic Review*.⁸

With regard to the paper’s contribution to the understanding of economic processes, an illuminating discussion was provided in 2005 by Oliver Williamson—himself later a Nobel laureate in economics. Williamson cited Hayek’s 1945 paper,

⁶ See Hayek (1945).

⁷ See Royal Swedish Academy of Sciences (1974, paragraph 10).

⁸ See Arrow and others (2011, p. 4).

along with Adam Smith's *The Wealth of Nations* from the eighteenth century, as forming the core of a "venerated tradition in economics" of studying the notion of "spontaneous order" arising from a freely operating market system.⁹

How does Hayek's case for the price system fit in alongside the other work that Williamson mentioned? As Paul Samuelson—yet another Nobel Prize winner—had occasion to note, the argument for the price system that Hayek articulated in 1945 was complementary with, but distinct from, the argument that Adam Smith espoused in *The Wealth of Nations*.¹⁰ Smith focused on how market mechanisms guide producers toward satisfying consumers' wants. Hayek instead stressed how the market mechanism makes, as he put it, "fuller use . . . of the existing knowledge" than a directed economy is able to do.¹¹

Hayek emphasized that the signals transmitted by the various individual prices in the economy could, together, serve as a useful means of guiding overall resource allocation. The reason is that prices convey messages to consumers and producers even when the information that drives prices is not aggregated or directly observed.¹² For example, a large increase or decrease in the price of gasoline conveys information that influences consumer behavior and that also affects the behavior of energy producers, even when neither of these sets of market participants are aware of the precise factor initiating the price change. As a related matter, Hayek recognized that prices transmit

⁹ See Williamson (2005, p. 1). This discussion referred to Smith (1776) and Arrow and Debreu (1954) alongside Hayek (1945).

¹⁰ See Samuelson (1983, p. 6).

¹¹ The quotation is from Hayek (1945, p. 521).

¹² Hayek's analysis therefore differed from general equilibrium approaches to economic problems, exemplified by the work of Arrow and Debreu (1954). Such approaches tend to evaluate market outcomes in terms of their ability to reproduce the allocation decided on by a hypothetical social planner who possesses complete knowledge of all information in the economy and who is charged with maximizing the welfare of the community.

information even in a situation in which much of that information is not explicitly disclosed by one market participant to another, or even consciously articulable by any market participant at all. Hayek believed that all of us “know” many things that we cannot articulate but that we nevertheless act on in practical situations, and the price system can therefore aggregate and transmit that knowledge which we could not otherwise convey.

Hayek’s analysis had implications for the viability of different economic systems. With regard to centrally planned economic systems—which had considerable support in the West in 1945, in light of the increased use of government economic controls in many countries during World War II and the dismal performance of market economies during the Great Depression—Hayek’s analysis suggested that these systems would likely exhibit great inefficiency. To Hayek, it was totally unrealistic to expect an economy to operate efficiently if it was based on the “direction of the whole economic system according to one unified plan,” as such a plan lacked the valuable information embedded in market-determined prices.¹³

The economist Gregory Mankiw has elegantly summed up Hayek’s insight here: “Information is very, very dispersed among the population. . . .Nobody can possibly know all the information you need to run a centrally planned economy.”¹⁴ Hayek’s economic analysis therefore complemented the philosophical and political arguments he marshaled against centrally planned economies in *The Road to Serfdom*. Again, it is important to recognize that this is not a contingent or technological problem. It is not only that the dispersion of knowledge makes it hard to gather, although that is certainly

¹³ See Hayek (1945, p. 521).

¹⁴ See Mankiw (2017).

true—but if that were the only issue, then perhaps future advances in technology such as quantum computing would remove that obstacle. Rather, as already mentioned, we all know many important things that we cannot articulate; and many of these things we come to know precisely through our participation in trade and exchange through the market. This type of knowledge (a) is by its nature not conveyable to a central planner because we are not fully aware of all we know, and (b) would not even exist apart from the social interactions facilitated by the market which a central planner would replace.

The flip side of Hayek’s analysis was that, while there are insurmountable obstacles to economic efficiency via a central plan, an efficient economy may still be obtainable by letting the price system work. To quote Mankiw again, Hayek’s analysis implies that “markets figure out a way to aggregate, in a decentralized way, dispersed information into desirable outcomes.”¹⁵ Furthermore, this mechanism does not require the government or any one individual to process that dispersed information into a central network or to be able to aggregate the information into a statistical series. It is, instead, sufficient for the proper operation of the price mechanism that the relevant information be embodied implicitly in the economy’s multiplicity of prices of individual goods and factors of production. This information is recorded in such prices because they respond to the behavior of individual buyers and sellers in the economy.¹⁶ Consequently, as longtime Hayek scholar Gerald O’Driscoll has observed: “What particularly recommends the price system to Hayek is the ‘economy of knowledge’ with which it operates. It is [in Hayek’s description] nothing short of a ‘marvel.’ ”¹⁷

¹⁵ See Mankiw (2017). See also Taylor (2012, p. 1).

¹⁶ The process is interactive, with market participants not only influencing prices, but also responding to price signals.

¹⁷ See O’Driscoll (1977, p. 27).

How Hayek (1945) Has Influenced Economics

Hayek's 1945 paper has had a great influence on subsequent economic research. It has been found to be highly relevant to a variety of areas of economic inquiry. For example, Hayek's analysis has proved valuable in the development of standard microeconomics, since his contribution deepened economists' understanding of the working of the price system and promoted further investigation of the question of how decentralized information is transmitted by markets.¹⁸ Hayek's emphasis on prices as processors of information has also had applications to international trade theory.¹⁹ And in macroeconomics and monetary theory, Milton Friedman's Nobel lecture, published in 1977, cited Hayek's 1945 paper when arguing that, because it disrupted the signals arising from relative-price movements, inflation both lowered the efficiency of the economy and led output to deviate from its natural (or full-employment) level.²⁰ Hayek likened the price mechanism to a "system of telecommunications," and Friedman's description of inflation as a form of "static" interrupting price signals was in keeping with this analogy.²¹

Hayek's ideas on prices influenced Joseph Stiglitz in his analysis of markets with asymmetric information and Roger Myerson's insights on mechanism design theory.

Each of these bodies of work earned a Nobel Prize.²²

¹⁸ See, for example, Serrano (2002).

¹⁹ For example, an article in the area of international trade noted (Bernhofen and Brown, 2004, p. 49): "The insight that prices contain the relevant information about underlying economic fundamentals goes back to the pioneering work of Hayek (1945)."

²⁰ See Friedman (1977, pp. 456–67). The notion that distortions to relative-price patterns lead the economy's output level to deviate from its natural value would be formalized by Woodford (2003).

²¹ See Hayek (1945, p. 527), and, for Friedman's use of the analogy between inflation and static, see Friedman and Friedman (1980, pp. 17, 274).

²² Shortly before he received the prize, Stiglitz (2000, p. 1468) noted that the 1945 Hayek paper recognized that "the central problem of economics was a problem of knowledge or information"—and so it anticipated

Qualifications and Extensions

I do not want to leave the impression, however, that all of the conclusions in Hayek's 1945 paper have become unchallenged principles chiseled into the economic consensus. On the contrary, one of the reasons why the paper has been so influential is that it remains a benchmark reference for understanding the case for relying primarily on a market system, based on freely determined prices, for determining the production and allocation of resources. The paper has therefore set a high bar for preempting the price system or for other interventions in the market: When economists point to cases in which market mechanisms can be improved on by regulation or other public-sector intervention, or to instances in which price signals do not appear to be operating effectively, they need to identify a specific market failure as the source of the inefficiency. Essentially, they need to establish instances in which the price system can be improved on as a means of processing information.²³

Even Hayek acknowledged that the price mechanism works within an ecosystem of laws and social institutions, and those may evolve in ways that interfere with the signaling of prices. For example, one of the important events that raised doubts about the functioning of the private market's pricing process occurred in the years leading up to the

the field of the economics of information. And in his Nobel lecture, Myerson (2008, p. 586) credited Hayek's "widely influential paper" with helping spur mechanism-design research—by characterizing alternative institutional frameworks as different mechanisms for "communicating widely dispersed information about the desires and the resources of different individuals in society."

²³ For example, while Stiglitz (2000) agreed that the price system is a means of collecting and transmitting dispersed information, he took issue with the notion that this system always produced the most efficient economic equilibrium. Specifically, Stiglitz argued that incomplete information could lead to unnecessarily high unemployment and other undesirable outcomes that could be improved on by government intervention. In a similar vein, Dasgupta (1980, p. 115) noted in response to Hayek's (1945) position: "It can immediately be argued that the fact that much information is private is not on its own sufficient to warrant the unfettered play of market forces to be judged the best possible resource allocation mechanism."

financial crisis. This period featured pricing by financial markets that seemed, in some prominent cases, not to be adequately reflecting information about actual risks. Spreads on risky private-sector debt reached very low levels, and damaging spillovers to the nonfinancial sector occurred in the form of unduly high real estate prices and excessive leverage by borrowers in the housing market. One of my predecessors at the Federal Reserve Board, Donald Kohn, has noted the seeming herd-like behavior of financial markets in the pre-crisis period that generated this situation—an “underpricing of risk.”²⁴

The financial crisis, and the deep recession that followed it, prompted changes in the United States’ regulatory framework. These changes have been designed to make the financial system more resilient than it was before the crisis. By creating appropriate incentives and rules, they should also encourage financial markets to price risk more appropriately than they did in the years leading up to the crisis—for example, by reducing the danger of investor complacency regarding the riskiness of their investments and the possibility of adverse scenarios. If we follow Hayek and regard the price system as like a telecommunications network, and then apply that metaphor to the financial sector, we can think of the institutional and regulatory changes to the financial system over the past decade as designed to improve the reliability and signal quality of the transmissions.²⁵

How does all of this relate to the larger questions of philosophy and social order to which Hayek devoted much of his thought? Hayek’s insights about the price system depend importantly on his theory of knowledge: The information that is available to us as a society is the aggregate of the highly dispersed and sometimes inarticulate

²⁴ See Kohn (2009). See also Yellen (2017, p. 4).

²⁵ I recently discussed post-crisis reform to financial regulation in Quarles (2019).

knowledge possessed by each of us individually. It is not only hard to convey that information to a central authority for processing into a rational decision—it is also conceptually impossible given the nature of that knowledge. And, indeed, important parts of that knowledge will not even be generated except through our interaction with each other through the mechanism of the market. Trying to centralize economic decisionmaking, then, is not just too hard to do as a practical matter. It would actually reduce the amount of knowledge available to us as a society, by replacing those myriad individual interactions in a free marketplace. Thus, even if some technological way to aggregate information other than through prices could be invented, it would lead to less efficient, less humane outcomes because it would be based on less total human information. The price mechanism, then, is not just a matter of economics—it is a matter of social and, indeed, civilizational progress. As Hayek says in *The Constitution of Liberty*, “[C]ivilization begins when the individual in pursuit of his ends can make use of more knowledge than he himself acquired and when he can transcend the boundaries of his ignorance by profiting from knowledge that he himself does not possess.”²⁶ I think this ties together the various threads of Hayek’s thought throughout a long life: his early work on psychology (“How do we know?”), his later epistemology (“What do we know, and what does it mean to know it?”), his economics (“How do we make knowledge usable?”), and his social and political theory (“What institutions will ensure that the greatest amount of human knowledge will be usable in the pursuit of their human fulfillment?”). Contrary to those polemicists across the ideological spectrum whose tendentious simplifications of Hayek’s thought would turn him into a crude icon rather

²⁶ See Hayek (1960, p. 22).

than a complex thinker, this is a deeply human, and a deeply humane, project. I will look forward to the contributions of the others you will hear from today in how Hayek elaborated it and how we can further these principles today.

Economic Outlook and Monetary Policy

Now I would like to turn to the current economic scene and this week's FOMC decision. Let me start by saying that the U.S. economy is doing well, and I am optimistic about the outlook. Economic conditions are currently very close to meeting our—that is, the FOMC's—dual-mandate objectives of maximum sustainable employment and price stability.

A particular source of strength has been the labor market. Setting aside the monthly volatility and, specifically, the effects of the recent strike at General Motors, labor market indicators are as strong as they have been in quite some time. The unemployment rate has been running near a 50-year low, and the proportion of the population currently employed is close to its highest level in a decade. Encouragingly, labor force participation has held up, as the tight labor market has motivated workers to either join or remain in the labor force, halting, at least for the time being, a long-standing downward trend. Although the pace of job gains has slowed this year, we expected some deceleration because of how low the unemployment rate has fallen.

A strong job market and high employment have in turn supported economic growth. Personal consumption expenditures (PCE) grew 2-1/2 percent over the past four quarters, a healthy pace by historical standards and a major contributor to overall growth since consumption represents over two-thirds of economic activity. Because the labor

market remains tight, I expect wage growth to pick up, which would then in turn underpin further strength in consumption and overall growth.

For the other half of our mandate, inflation as measured by the PCE index was 1.3 percent over the 12 months ending in September, while core PCE inflation, which excludes increases in the prices of food and energy, was 1.7 percent. While these readings are below our 2 percent inflation objective, they are fairly close, and my assessment is that inflation will inch toward our objective in the coming months.

Outside the near term, I am also optimistic about the longer-term potential of the U.S. economy. I am heartened by a recent pickup in labor productivity growth. A notable development of the post-crisis period has been the abysmal pace of labor productivity growth. After averaging about a 2-1/4 percent pace in the two decades leading up to the crisis, labor productivity growth has been closer to 1 percent, on average, since 2011. While there has been much speculation, it remains to be seen what has driven this slowdown. Consequently, the slowdown could resolve unpredictably. Although the quarterly data are volatile, I have been encouraged by a pickup in labor productivity in the first half of this year, when it grew at a 3 percent annual rate. Further out, I admit to being a bit of techno-enthusiast, and I see the potential for many emerging technologies, including 5G communications, artificial intelligence and machine learning, and 3-D printing, to further boost productivity growth in the coming years.

Having established my optimism, I will now circle back to some more worrying signs in the recent data that suggest some headwinds are holding back growth. One prominent factor weighing on a relatively robust domestic economy has been weak growth among our trading partners. The International Monetary Fund projects that global

economic growth in 2019 will be the slowest since the financial crisis. Partly as a consequence of weak foreign growth, U.S. exports have been flat over the past year.

Another weak spot has been investment. After a strong 2017 and start to 2018, business fixed investment has tailed off this year and fallen outright in the second and third quarters. I find the weakness of investment to be of particular concern because increasing investment and the capital stock are important for raising the potential capacity of the economy. It is likely that some of the weakness in capital spending is a result of elevated uncertainty, for foreign growth generally but also specifically for trade developments.

Against this backdrop, at our meeting earlier this week, we decided to lower our target range for the federal funds rate for the third time this year. We took this action to help keep the U.S. economy strong in the face of global developments and to provide some insurance against ongoing risks. By lowering the federal funds rate this year, we are supporting the continued expansion of the economy. Overall, with these policy adjustments, I believe that the economy will remain in a good place, with the labor market remaining strong and inflation staying close to our 2 percent objective. We see the current stance of monetary policy as likely to remain appropriate as long as incoming information about the economy continues to be broadly consistent with our outlook of moderate economic growth, a strong labor market, and inflation near our symmetric 2 percent objective.

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