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The Contributions of Milton Friedman to Economics

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Milton Friedman died November 16, 2006, at the age of 94. Any attempt to put his contributions to economics into perspective can only begin to suggest the vast variety of ideas he discussed. Burton (1981, 53) commented that "attempting to portray the work of Milton Friedman . . . is like trying to catch the Niagara Falls in a pint pot."[1] At the beginning of his career, Friedman adopted two hypotheses that isolated him from the prevailing intellectual mainstream. First, central banks are responsible for inflation and deflation. Second, markets work efficiently to allocate resources and to maintain macroeconomic equilibrium.[2] Because of his success in advancing these ideas in a way that shaped the understanding of the major economic events of this century and influenced public policy, Friedman stands out as one of the great intellectuals of the 20th century.

I make use of taped material from an interview with Milton and Rose Friedman that Peter Robinson and I conducted at the Hoover Institution on April 8, 1996. I also use taped material from an interview with Milton Friedman conducted June 29, 1996, taped material sent by Milton Friedman on November 26, 1996, and a taped interview with David Meiselman on August 20, 1999. I am grateful for comments from Thomas Humphrey, David Laidler, Aaron Steelman, and Roy Webb. The views expressed in this article are not necessarily those of the Federal Reserve Bank of Richmond or the Federal Reserve System.

[1] For other overviews of Friedman's contributions to economics, see Carlstrom and Fuerst (2006); Hetzel (1997, 2006); Laidler (2005, forthcoming); and Timberlake (1999).

[2] In contrast, the Keynesian orthodoxy of the day assumed that inflation arose from an eclectic collection of causes and the price system did not work to maintain aggregate demand at a level sufficient to maintain full employment. The appeal of these assumptions, an appeal made irresistible by the Depression, rested on their apparent descriptive realism rather than on the optimizing behavior assumed by neoclassical economics. See the quotations in the following section.

1. FRIEDMAN'S INTELLECTUAL ISOLATION

Until the 1970s, the economics profession overwhelmingly greeted Friedman's ideas with hostility. Future generations can easily forget the homogeneity of the post-war intellectual environment. Friedman challenged an intellectual orthodoxy. Not until the crisis within the economics profession in the 1970s prompted by stagflation and the failure of the Keynesian diagnosis of cost-push inflation with its remedy of wage and price controls did Friedman's ideas begin to receive support. More than anyone, over the decades of the 1950s and 1960s, Friedman kept debate alive within the economics profession.[3]

Because economics is a discipline that advances through debate and diversity of views, it is hard to account for the near-consensus in macroeconomics in the post-war period and also the antagonism that met Friedman's challenge to that consensus. In order to place his ideas in perspective, this section provides some background on prevailing views in the 1950s and 1960s. The Depression had created a near-consensus that the price system had failed and that it had failed because of the displacement of competitive markets with large monopolies. Intellectuals viewed the rise of the modern corporation and labor unions as evidence of monopoly power. They concluded that only government, not market discipline, could serve as a countervailing force to their monopoly power. Alvin Hansen (1941, 47), the American apostle of Keynesianism, wrote:

> In a free market no single unit was sufficiently powerful to exert any appreciable control over the price mechanism. In a controlled economy the government, the corporation, and organized groups all exercise a direct influence over the market mechanism. Many contend that it is just this imperfect functioning of the price system which explains the failure to achieve reasonably full employment in the decade of the thirties. . . . It is not possible to go back to the atomistic order. Corporations, trade-unions, and government intervention we shall continue to have. Modern democracy does not mean individualism. It means a system in which private, voluntary organization functions under general, and mostly indirect, governmental control. Dictatorship means direct and specific control. We do not have a choice between "plan and no plan." We have a choice only between democratic planning and totalitarian regimentation.

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[3] Other economists in what became known as the monetarist camp were Friedman's students: Phillip Cagan, David Meiselman, Richard Selden, and Richard Timberlake. Other monetarists who were not students of Friedman were Karl Brunner, Thomas Mayer, Thomas Humphrey, Allen Meltzer, Bill Poole, and, of course, Friedman's frequent coauthor, Anna Schwartz. The term "monetarist" came from Brunner (1968).

Jacob Viner (1940, 7–8), who taught Friedman price theory at the University of Chicago, aptly characterized the intellectual environment engendered by the Depression:

> Instead of the economy of effective competition, of freedom of individual initiative, of equality of economic opportunity, of steady and full employment, pictured in the traditional theory, they [economists who reject the competitive market model] see an economy dominated by giant corporations in almost every important field of industry outside agriculture, an economy marked by great concentration of wealth and economic power, and great disparity of income and of opportunity for betterment. They note the apparently unending flow of evidence from investigating committees and courts of the flagrant misuse of concentrated economic power. They observe with alarm the failure of our economy for ten successive years to give millions of men able to work and anxious to work the opportunity to earn their daily bread. And seeing the actual world so, they refuse to accept as useful for their purposes a type of economic theory which as they read it either ignores these evils or treats them as temporary, self-correcting aberrations or excrescences of what is basically a sound economic system. Having rejected the conventional picture of the system, they tend increasingly to adopt another one, rapidly approaching equal conventionalization, but following another pattern, in which the evils are inherent in the system and cannot be excised without its drastic reconstruction and its substantial operation by government.

From the premise that the price system cannot coordinate economic activity, intellectuals concluded that government should limit the freedom possessed by individuals to make their own decisions.

The impetus to the Keynesian revolution was the belief that the price system could neither allocate resources efficiently nor ensure macroeconomic stability. Today, it is hard to recall how long that view dominated the economics profession. Almost alone within the intellectual community in the 1950s and 1960s, Friedman advocated constraining government policy by rules in order to allow the price system maximum latitude to work. In a debate with Friedman, Walter Heller (Friedman and Heller 1969, 28, 78), chairman of the Council of Economic Advisors under President John F. Kennedy, expressed the consensus view in rejecting Friedman's proposed rule calling for the money stock to increase at a constant rate: "[L]et's not lock the steering gear into place, knowing full well of the twists and turns in the road ahead. That's an invitation to chaos." Friedman replied:

> The reason why that [the rule for steady money growth] doesn't rigidly lock you in, in the sense in which Walter was speaking, is that I don't believe money is all that matters. The automatic pilot is the price system. It isn't perfectly flexible, it isn't perfectly free, but it has a good deal

> of capacity to adjust. If you look at what happened to this country when we adjusted to post-World War II, to the enormous decline in our expenditures, and the shift in the direction of resources, you have to say that we did an extraordinarily effective job of adjusting, and that this is because there is an automatic pilot. But if an automatic pilot is going to work, if you're going to have the market system work, it has to have some basic, stable framework.

2. THE CHICAGO SCHOOL

Along with Friedman, a group of Chicago economists became known as the Chicago School.[4] Collectively, their work showed that within a competitive marketplace the price system works efficiently to allocate resources.[5] Friedman (1988, 32) wrote:

> Fundamentally prices serve three functions.... First, they transmit information.... This function of prices is essential for enabling economic activity to be coordinated. Prices transmit information about tastes, about resource availability, about productive possibilities.... A second function that prices perform is to provide an incentive for people to adopt the least costly methods of production and to use available resources for the most highly valued uses. They perform that function because of their third function, which is to determine who gets what and how much—the distribution of income.

Friedman's defense of free markets and criticism of government intervention in the marketplace were always controversial. By basing his arguments on the logic of price theory, Friedman kept debate on a high intellectual level. Friedman (Friedman and Kuznets 1945) established the pattern for his contributions to public policy in his book, *Income from Independent Professional Practice,* coauthored with Simon Kuznets. In it, he calculated the rate of return to education by dentists and doctors. The book was one of the earliest studies in the field of human capital. Friedman also argued that the higher return

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[4] They included George Stigler, H. Gregg Lewis, Aaron Director, Ronald Coase, Gary Becker, D. Gale Johnson, Theodore Schultz, and Arnold Harberger. Frank Knight, Henry Simons, and Jacob Viner represented an earlier generation. Milton Friedman (1974b) and George Stigler (1962) both regarded reference to a Chicago school as misleading because it did not do justice to the diversity of intellectual opinion at Chicago. (For a discussion of the Chicago School, see Reder 1982.) For example, Chicago in the 1950s and 1960s tried to have a preeminent Keynesian on its staff, first Lloyd Metzler and then Harry Johnson (who, nevertheless, became a critic of Keynesian ideas). Apart from Chicago, the Mont Pelerin Society assembled intellectuals who defended free markets.

[5] When I (Hetzel) was a student at Chicago, courses had problem sets and exams organized around a list of questions requiring analysis of situations often drawn from newspapers. By the time a student graduated from Chicago, he/she had applied the general competitive model to hundreds of practical problems. Through continual practice, students developed a belief in the usefulness of the competitive market model for economic analysis.

received by doctors on their investment in education relative to dentists derived from restrictions on entry imposed by the American Medical Association (AMA).[6]

Friedman defused normative conflicts by defining issues in terms of the best way to achieve a common objective. Friedman ([1953] 1953, 5) wrote in "The Methodology of Positive Economics":

> [D]ifferences about economic policy among disinterested citizens derive predominantly from different predictions about the economic consequences of taking action—differences that in principle can be eliminated by the progress of positive economics—rather than from fundamental differences in basic values, differences about which men can ultimately only fight.

In an early application of economic analysis to a problem of public policy, Friedman and Stigler (1946) criticized rent controls as counterproductive.

Examples of Friedman's application of positive economic analysis to public policy issues are almost boundless. One example is, "Inflation: Causes and Consequences," in *Dollars and Deficits* (Friedman 1968, chap.1), which summarized lectures delivered in Bombay, India, in 1963. Friedman described the distorting effects of using government controls to suppress inflation and explained how an overvalued exchange rate, propped up by exchange controls, wastes resources. The waste cannot be justified no matter what the economic philosophy of the government. The chapter also summarized succinctly Friedman's quantity-theory-of-money views and gave birth to the expression, "Inflation is always and everywhere a monetary phenomenon" (p. 39).

3. EARLY INTELLECTUAL FORMATION

In an autobiographical essay, *Lives of the Laureates*, Friedman (1986, 82) wrote about his decision to study economics:

> I graduated from college in 1932, when the United States was at the bottom of the deepest depression in its history before or since. The dominant problem of the time was economics. How to get out of the depression? How to reduce unemployment? What explained the paradox of great need on the one hand and unused resources on the other? Under the circumstances, becoming an economist seemed more relevant to the burning issues of the day than becoming an applied mathematician or an actuary.

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[6] Friedman (tape recording, November 26, 1996) said, [The book] "did not get published until after the war because of the controversy about the AMA raising the income of physicians by restricting entry." This work constituted Friedman's Ph.D. thesis, which Columbia awarded to Friedman in 1946.

Friedman was a graduate student at the University of Chicago in the academic years 1932–1933 and 1934–1935.[7] In 1933–1934, he was at Columbia. Friedman took Jacob Viner's price theory course his first year at Chicago. Friedman (tape recording, November 26, 1996) recounted:

> His Smithian temperament certainly did come across in that course. Indeed, I believe that Viner's course was one of the great experiences of my life. It really opened up a new world for me. It enabled me to see economics as a coherent discipline in a way that I had not seen it before. . . . [T]he belief that markets work at both the macroeconomic and microeconomic level is something that I left Chicago with in 1935.

Columbia nourished Friedman's empirical temperament. Friedman (tape recording, November 26, 1996) said:

> My empirical bent did not come from Chicago. Where it ultimately came from I do not know, but it was certainly strongly affected by Arthur Burns, and particularly by a seminar I took from him [at Columbia], which consisted of going over his book on production trends. In addition, it was reinforced by the course on statistics I took from Henry Schultz at Chicago and the course in mathematical statistics at Columbia from Hotelling. That course was extremely important.

Friedman's first job was with the National Resources Committee (NRC) in 1935 in Washington, D.C., Friedman (tape recording, November 26, 1996) worked on:

> . . . developing a large scale study of consumer purchases. It was a study intended to provide basic budget data to calculate the weights for the CPI . . . The use of ranks did arise out of some problems that we met on the study of consumer purchases. I wrote the first draft of "The Use of Ranks to Avoid the Assumption of Normality Implicit in the Analysis of Variance" (Friedman 1937) while I was employed at the NRC. That paper on the analysis of ranks was indeed one of the first papers in the area of nonparametric inference. It was not, however, my first publication. My first publication was an article in the *Quarterly Journal of Economics* in November 1934 on Professor Pigou's method of measuring elasticities of demand from budgetary data. In fact, in the list of my publications, the use of ranks was the ninth of my publications.

Friedman worked at the Treasury in the Division of Tax Research from 1941 to 1943. After he left the Treasury, Allen Wallis, a Chicago classmate, brought him to the Statistical Research Group (SRG) at Columbia, which

[7] For a review of economics at Chicago in the 1930s, see Reder (1982) and Patinkin (1981).

Wallis headed with Harold Hotelling. Friedman became associate director. The SRG provided statistical support to various war-related projects. Wallis (1980, 322) told how, during the Battle of the Bulge, Army officers flew from Europe to Columbia where Friedman briefed them on work he had done on the performance of proximity fuses. Wallis also described how he and Friedman pioneered what came to be known as sequential analysis. Wallis had been given the problem of working on the necessary size of samples to use in testing military ordnance. Classical tests seemed to require too many observations: a seasoned observer could tell more quickly whether an experimental ordnance was working or not. Wallis (1980, 325–6) wrote, quoting from a 1950 letter:

> If a wise and seasoned ordnance expert like Schuyler were on the premises, he would see after the first few thousand or even hundred [rounds] that the experiment need not be completed. . . . [I]t would be nice if there were some mechanical rule which could be specified in advance stating the conditions under which the experiment might be terminated earlier than planned. . . . Milton explored this idea on the train back to Washington one day, and cooked up a rather pretty but simple example involving Student's t-test. . . . He [Milton] said it was not unlikely, in his opinion, that the idea would prove a bigger one than either of us would hit on again in a lifetime. . . . Wald was not enthusiastic. . . . [H]is hunch was that such tests do exist but would be found less powerful than existing tests. On the second day, however, he phoned that he had found that such tests do exist and are more powerful.[8]

At the SRG, Friedman worked with the Bayesian statistician Leonard Savage, whom he described as "one of the few geniuses I have met in my life" (tape recording, November 26, 1996). Friedman and Savage (1948) later devised a form of the utility function that explained how the same person might buy both insurance and a lottery ticket.

4. METHODOLOGY

At the SRG, Friedman worked solely as an applied statistician. In fall 1946, he accepted a position at the University of Chicago teaching the price theory course formerly taught by Viner. At Chicago, Friedman began thinking about how to formulate and test theories. The issue arose in the context of the debate in the mid-1940s between institutionalists and what we now call neoclassical economists over whether to organize economic theorizing around marginal analysis. Friedman argued that, in testing a theory, economists should only consider predictive ability, not descriptive realism. In contrast, institutionalists judged the validity of a theory by its descriptive realism.

[8] See also Anderson and Friedman (1960).

In "The Methodology of Positive Economics," Friedman ([1953] 1953, 30) noted "... the perennial criticism of 'orthodox' economic theory as 'unrealistic'....
[I]t assumes markets to be perfect, competition to be pure, and commodities, labor, and capital to be homogeneous...." Friedman ([1953] 1953, 31) contended that "... criticism of this type is largely beside the point unless supplemented by evidence that a hypothesis differing in one or another of these respects from the theory being criticized yields better predictions for as wide a range of phenomena."

Friedman (tape recording, June 29, 1996) said:

> The validity of a theory depends upon whether its implications are refuted, not upon the reality or unreality of its assumptions. In 1945 and 1946, there was a discussion in the economic literature about how to test a theory. All of this derived from surveys of R. L. Hall and C. J. Hitch (1939) who went around and asked businessmen, "Do you calculate marginal cost?" and "Do you equate price with marginal cost?" Marginal analysis assumes people are rational. The essence of this approach was, go ask them whether they are rational! Do businessmen equate price to marginal cost? Let's go and ask them. My argument was that the assumptions are utterly irrelevant. What matters is whether businessmen behave as if the assumptions are valid. The only way you can test that is by seeing whether the predictions you make are refuted.

Friedman gained a victory with the change in the way the economics profession approached the determination of the price level. Through at least the early 1970s, most economists approached the causes of inflation eclectically by advancing a taxonomy of causes. Gardner Ackley (1961, 421–57), for example, in his textbook, classified the determinants of inflation under the headings of "demand inflation" ("demand pull"), "cost inflation" ("cost-push"), "mixed demand-cost inflation," and "markup inflation." Additional variants used by economists included the "wage-price spiral" and "administered prices." The appeal of these nonmonetary explanations of inflation lay in their apparent descriptive realism.

In contrast, the monetary framework used by Friedman attributed the behavior of prices to central bank policies that determined money creation. This latter framework, despite its simplicity, ultimately prevailed because of its predictive ability. Nonmonetary theories of inflation not only failed to predict the inflation of the 1970s, but also offered misleading guidance for how to control it. Mainstream economists explained cost-push inflation as the inflation that occurred when the unemployment rate exceeded full employment, which they

assumed to be 4 percent.[9] This analysis made government interference in the price- and wage-setting decisions of corporations appear as an attractive alternative to raising the unemployment rate as a way of controlling inflation. However, confronted, on the one hand, with repeated worldwide failures of wage and price controls to suppress inflation and, on the other hand, with the unique ability of central banks to control inflation, economists came around to Friedman's position that central banks were responsible for inflation.[10]

5. FRIEDMAN BECOMES A MONETARIST

The Depression had lasted for an interminable period and only disappeared with the start of World War II. The belief was widespread that the chronic lack of aggregate demand that had characterized the Depression would return after the war. One reason that Keynesianism swept academia was the belief that it offered an antidote to an inherent tendency of the price system to produce recurrent spells of high unemployment. Friedman (tape recording, April 8, 1996) said:

> At the London School of Economics the dominant view in 1932 and 1933 was that the Depression was an inevitable correction. It was an Austrian view. It also prevailed at Harvard with Schumpeter and Taussig and at Minnesota with Alvin Hansen, who wrote a book with that view. What was important was the attitude that the Depression was something that could be solved. The view in London, Harvard, and Minnesota was that the Depression was a necessary cure for the ills that had been built up before and should be allowed to run its course and correct itself. So it was a very gloomy view. When Keynes came along and said here is a simple explanation of the Depression and a way to cure it, he attracted converts.

In the late 1940s, Friedman worked on macroeconomic stabilization policies that operated through rules rather than discretionary government intervention. In 1948, in "A Monetary and Fiscal Framework for Economic Stability," he proposed that the government run a countercyclical budget policy with

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[9] The term "stagflation" arose to describe the simultaneous occurrence of high inflation and high unemployment. As highlighted by the empirical correlations of the Phillips curve, stagflation was at odds with the historical relationship between high unemployment and low inflation.

[10] Friedman ([1958] 1969) pointed out the positive relationship between high rates of money growth and inflation and between declines in money and deflation. At present, because of the achievement of near price stability by central banks along with instability in the public's demand for real money (the purchasing power of money), money is no longer useful for predicting inflation. However, Friedman's basic point that inflation is a monetary phenomenon remains. That is, today when economists look for an explanation of inflation, they look to monetary policy, not some eclectic mixture of factors such as the market power of unions, government regulation, and so on.

monetization of deficits and demonetization of surpluses with budget balance over the cycle. However, he was not yet a quantity theorist.

Friedman became a quantity theorist when he realized that he could endow the quantity theory with predictive content by assuming that velocity was a stable variable.[11] Velocity was predictable because empirical investigation showed that it depended on a small number of variables in a way suggested by economic theory (Friedman 1956). The equation of exchange then became for Friedman not simply a tautological identity but rather "an engine of analysis," the phrase of Alfred Marshall that Friedman used. After the war, economists were familiar with the quantity theory but considered it an intellectual relic—an irrelevance in light of the apparent powerlessness of central banks to stimulate expenditure during the Great Depression. Once Friedman came to see money growth as a predictor of inflation, he could rejuvenate quantity theory analysis. He advanced the equation of exchange as a superior alternative to the Keynesian autonomous-expenditures analysis for explaining output.[12]

When Friedman went to Chicago in 1946, he was primarily an applied econometrician. In 1948, Arthur Burns, who was head of the National Bureau of Economic Research (NBER), teamed Friedman up with Anna Schwartz to work on a study of the cyclical behavior of money. Friedman and Schwartz ([1963]1969) published the results of their work 15 years later. Their collaboration blossomed eventually into three NBER volumes on money: *A Monetary History of the United States, 1867–1960* (1963), *Monetary Statistics of the United States* (1970), and *Monetary Trends in the United States and the United Kingdom* (1982). As elaborated in *Monetary Statistics*, Friedman and Schwartz created consistent statistical time series on money starting in 1867. The enormous efforts put into constructing series on money attest to the importance they assigned to empirical investigation.

With the NBER money series, Friedman analyzed the behavior of money and inflation in "Price, Income, and Monetary Changes in Three Wartime Periods." He compared the rise in the price level and nominal income in the Civil War, World War I, and World War II. The price level rose by a similar amount in each episode from the onset of the war to its subsequent peak. Friedman argued that those periods constituted a useful experiment for distinguishing between Keynesian and quantity theory explanations of inflation.

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[11] The quantity theory is expressed by the equation of exchange—the algebraic relationship between, on the one hand, the amount of money individuals hold and the rate at which they spend it (velocity) and, on the other hand, nominal expenditure, which comprises the product of some measure of real output or transactions and an appropriate price index.

[12] Keynesian analysis held that output (income) expanded to generate the savings required to match autonomous expenditures (government spending and investment).

According to Keynesian theory, the rise in prices and nominal income should depend upon the way that government financed the increase in war expenditures. Accordingly, the rise in prices and nominal income should vary inversely with the extent to which government financed the rise in war expenditures through taxes as opposed to deficit spending. Friedman found to the contrary that money, not fiscal policy, provided a satisfactory explanation for the common behavior of inflation in these wars. The behavior of money per unit of output explained inflation in each of the three episodes. Friedman ([1952] 1969, 170) concluded, "If you want to control prices and incomes, they [the conclusions] say, in about as clear tones as empirical evidence ever speaks, control the stock of money per unit of output."

Friedman made his first public statement supporting the quantity theory in 1952 at the Patman hearings on monetary policy. Paul Samuelson (U.S. Cong. 1952, 720) testified:

> The current edition of the *Encyclopedia Britannica* mentions this formula MV equals PT, and it says of the four [variables], three are completely unobservable, and must be constructed, and on the basis of my provocative testimony this morning, the fourth [money] has been brought into suspicion.

Friedman (U.S. Cong. 1952, 720) countered:

> I believe that the quantity equation can be defended not only as a truism, but as one of the few empirically correct generalizations that we have uncovered in economics from the evidence of the centuries. It is, of course, true that velocity varies over short periods of time. The fact of the matter, however, is that these variations, especially of income velocity, are in general relatively small. So far as I know there is no single equation that has been developed in economics that has nearly as much predictive power as this simple truism.

Friedman (U.S. Cong. 1952, 689) stated, "The primary task of our monetary authorities is to promote economic stability by controlling the stock of money. . . .[M]onetary policy should be directed exclusively toward the maintenance of a stable level of prices."

6. INTERNATIONAL MONETARY ARRANGEMENTS

After World War II, the countries of Europe managed their trade bilaterally so that transactions would balance country by country and there would be no need for settlement in dollars (Yeager 1976, chap. 21). By spring 1947, there were 200 bilateral agreements controlling trade in Europe alone. One goal of the Marshall plan was to liberalize trade within Europe. Friedman spent the fall of 1950 in Paris, where he served as a consultant to the U.S. Marshall Plan

Agency. He analyzed the Schuman Plan, which would form the basis for the European Coal and Steel Community. The latter, in turn, became the basis for the European Common Market.

Friedman's visit coincided with a German foreign exchange crisis and preceded a similar crisis in the United Kingdom. In a memo, Friedman (1950) argued that the success of the Community depended not only upon elimination of trade restrictions, but also upon the elimination of capital controls. Fixed exchange rates, however, encouraged such controls. In contrast, freely floating exchange rates would render them unnecessary. That memo was the basis for Friedman's (1953) essay, "The Case for Flexible Exchange Rates." With fixed exchange rates, Friedman argued that the price level varied to clear the foreign exchange market by adjusting the real terms of trade (the price of domestic in terms of foreign goods).[13]

Friedman's view that the price level varied to achieve macroeconomic equilibrium clashed with the Keynesian consensus, which viewed the price level as institutionally determined, especially through the price setting of large monopolies. Keynesian analysis emphasized the long-lasting adjustment of quantities (real output and income), not prices in the elimination of disequilibrium (Friedman 1974a, 16ff). Accordingly, with fixed exchange rates, real output would adjust to eliminate balance of payments disequilibria. This fundamental difference in views about the equilibrating role of the price level carried over to the world of flexible exchange rates. In this case, Friedman argued that the price level was not institutionally determined but rather functioned as part of price system by varying to clear the market for the quantity of money. Changes in the price level endowed nominal (dollar) money with the real purchasing power desired by the public.

With fixed exchange rates, countries had to surrender control over the domestic price level. Friedman ([1953] 1953, 173) argued, "It is far simpler to allow one price to change, namely, the price of foreign exchange, than to rely upon changes in the multitude of prices that together constitute the internal price structure." Friedman ([1953] 1953, 175) also made what has become the classic case for speculation. "People who argue that speculation is generally destabilizing seldom realize that this is largely equivalent to saying that speculators lose money, since speculation can be destabilizing in general only if speculators on the average sell when the currency is low in price and buy when it is high."[14]

Friedman's wife, Rose Friedman, (1976, 24) commented later, "In a pattern that has since been repeated in other contexts, his recommendation was

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[13] In "The Case for Flexible Exchange Rates," Friedman revived the quantity-theoretic price-specie-flow mechanism of David Hume that Keynes (1924) had used in *A Tract on Monetary Reform* to explain the determination of balance of payments and exchange rates. See Humphrey and Keleher (1982).

[14] See also "In Defense of Destabilizing Speculation," 1960 in Friedman (1969).

disregarded but the consequences he predicted occurred." Increasingly in the 1960s, the United States resorted to capital controls to maintain the value of the dollar set under the Bretton Woods system. The Bretton Woods system of fixed exchange rates finally collapsed in March 1973.

7. "MONEY MATTERS"

The heart of the quantity theory is the idea that money creation determines the behavior of prices. Friedman gave empirical content to the theory by studying instances where historical circumstances suggested that money was the causal factor in this relationship. Friedman ([1958] 1969, 172–3) argued:

> There is perhaps no empirical regularity among economic phenomena that is based on so much evidence for so wide a range of circumstances as the connection between substantial changes in the stock of money and in the level of prices. . . . [I]nstances in which prices and the stock of money have moved together are recorded for many centuries of history, for countries in every part of the globe, and for a wide diversity of monetary arrangements. . . .

In the 1950s, Friedman engaged in empirical work on the interrelationships of money, prices, and income over the business cycle. Based on that work, he developed a critique of Keynesian economics and a positive program of monetary reform. As noted above, Friedman championed his approach on the empirical grounds that the income velocity of money, emphasized by the quantity theory, was historically more stable than the relationship between investment (autonomous expenditures) and income, emphasized by Keynesianism.

In 1955, Friedman and David Meiselman (1963) began working on the paper that became "The Relative Stability of Monetary Velocity and the Investment Multiplier in the United States, 1897–1958." They calculated numerous regression equations involving income and contemporaneous and lagged values of autonomous expenditures and money. Because Meiselman had to estimate the regressions by hand, the project involved an enormous effort. Meiselman (tape recording, August 20, 1999) recounted that they had clear results by 1958 but delayed publication until 1963 because of the time involved in checking the calculations. Friedman and Meiselman demonstrated that correlations between money and consumption were higher than correlations between a measure of autonomous expenditure (net private investment plus the government deficit) and consumption. In Meiselman's words (tape recording August 20, 1999), "The paper created an enormous stir." [15]

[15] An extensive literature appeared critical of the paper. Because of the rejoinders by Albert Ando and Franco Modigliani, the debate was called the battle of the radio stations (AM versus FM).

Later, Leonall Andersen and Jerry Jordan (1968) at the St. Louis Fed performed a similar experiment. Their regressions showed that money, rather than the full-employment government deficit, was more closely related to nominal output. They claimed that their results demonstrated the importance of monetary policy and the impotence of fiscal policy. The Keynesian rebuttals of the Friedman-Meiselman and Andersen-Jordan work made a valid econometric point that the reduced forms these authors estimated were not appropriate for testing a model. One needed to estimate a final form derived from a model. With such a functional form, the right-hand variables in the regression would be exogenous and one could talk about causation.[16]

Nevertheless, the Friedman-Meiselman results surprised the profession and created considerable consternation. They successfully made the point that Keynesians had little empirical evidence to support their position. This criticism provided a major stimulus to the development of large-scale econometric models.

8. A MONETARY HISTORY OF THE UNITED STATES: 1867–1960

Milton Friedman's most influential work, coauthored with Anna Schwartz, was *A Monetary History of the United States, 1867–1960*. It provided the historical narrative supporting the contention that in many episodes, monetary instability arose independently of the behavior of nominal income and prices. As a result, Friedman and Schwartz could infer causation from the empirical generalizations they distilled in a way that guarded against the *post hoc ergo propter hoc* fallacy.[17] Friedman and Schwartz ([1963] 1969, 220) wrote:

> [A] longer period change in money income produced by a changed secular rate of growth of the money stock is reflected mainly in different price behavior rather than in a different rate of growth of output; whereas a shorter-period change in the rate of growth of the money stock is capable of exerting a sizable influence on the rate of growth of output as well. These propositions offer a single, straightforward interpretation of all the historical episodes involving appreciable changes in the rate of monetary growth that we know about in detail. We know of no other single suggested interpretation that is at all satisfactory.

See Hester (1964); the Friedman-Meiselman (1964) reply; Ando and Modigliani (1965); DePrano and Mayer (1965); and the Friedman-Meiselman (1965) reply.

[16] Basically, when the relevant variables are all determined together, their correlations say nothing about causation. To test causation, the economist must express relationships with independently determined (exogenous) variables on the right-hand side of regressions.

[17] That is, it is fallacious to infer causation from temporal antecedence.

Most dramatically, Friedman and Schwartz documented that an absolute decline in the money stock accompanied all the deep depressions they examined (1875–1878, 1892–1894, 1907–1908, 1920–1921, 1929–1933, and 1937–1938). At times, the influence of events, of political pressures, and of the actions of the Fed on the money stock was largely adventitious so that the resulting behavior of money could only be seen as an independent destabilizing influence. Friedman and Schwartz examined in detail the following events: the inflation accompanying the issuance of Greenbacks in the Civil War and the deflation associated with the return to the gold standard in the 1870s; the destabilizing populist agitation for free coinage of silver and the run on banks in 1893; the inflation associated with gold discoveries in the 1890s; and the economic contraction and deflation following the Fed's increase in the discount rate from 4 to 7 percent between fall 1919 and summer 1920. With respect to the latter event, Friedman (1960, 16) wrote, "The result was a collapse in prices by nearly 50 percent, one of the most rapid if not the most rapid on record, and a decline in the stock of money that is the sharpest in our record up to this date."

Although other economists, including Irving Fisher and Clark Warburton, had argued for a monetary explanation of prices and the business cycle, the arguments of Friedman and Schwartz were more persuasive because they provided an explanation that rationalized the entire period from 1867 to 1960. Although the Depression was extreme, it was still only a particular case. Even though written for economists, *A Monetary History* was one of the most influential books of the 20th century because of the way it radically altered views of the cause of the Depression. Economists had interpreted the Depression as evidence of market failure and the impotence of monetary policy to deal with that failure. They believed the near-zero level of short-term interest rates on Treasury bills meant that an "easy" monetary policy could not bring the economy out of recession.

In contrast, Friedman and Schwartz explained the Depression not as a failure of the free enterprise system that overwhelmed monetary policy, but rather as a result of misguided actions of the Fed. The Fed, far from being a passive actor as had commonly been believed, took highly destabilizing actions. For example, in fall 1931, when Britain went off the gold standard, the Fed raised the discount rate from 1 1/2 to 3 1/2 percent, a drastic contractionary move.[18] Just as damaging was what the Fed did not do, namely, undertake the open market purchases that would have reversed the decline in money.

[18] For a succinct overview, see Friedman (1997).

9. THE NATURAL RATE HYPOTHESIS AND THE PHILLIPS CURVE

Friedman applied the same guiding principles of neoclassical economics to the analysis of the inflationary monetary policy of the 1970s as he had to the deflationary monetary policy of the 1930s. That is, the behavior of prices is a monetary phenomenon and the price system works. To give content to the first idea, Friedman rigorously applied the quantity theory distinction between nominal and real variables in combination with the assumption that welfare depends only upon real variables. As a result, the central bank can use its control over nominal money (the monetary base) as a lever and the public's demand for the purchasing power expressed by real money as a fulcrum to control the price level. However, it cannot systematically control the level of real variables (the natural rate hypothesis).[19]

Friedman's famous principle that "inflation is always and everywhere a monetary phenomenon" had originally referred to the positive correlation between trend money growth and inflation. In the period of stop-go monetary policy, its spirit became that the Fed can maintain price stability without either permanent or periodic recourse to high unemployment. This hypothesis combined both of Friedman's working assumptions: the price system works and the price level is a monetary phenomenon. Friedman ([1979] 1983, 202) expressed the hypothesis through the implication that ending inflation would involve only a transitory increase in unemployment.

Friedman's working assumptions challenged the macroeconomic models of the day. The standard models of the 1960s elaborated the IS-LM apparatus that British economist John R. Hicks used to make explicit Keynes' model in *The General Theory* (1936).[20] Economists typically used such models to explain the effects of monetary and fiscal policy on output without building in explicit constraints based on unique full-employment values. They did so based on the assumption that the price system works poorly to assure full employment. Because chronically the supply of labor supposedly could exceed the demand for labor, stimulative aggregate-demand policies could raise output and lower unemployment. Also, the central bank could permanently lower

[19] A real variable is a physical quantity or a relative price—the rate at which one good exchanges for another. A nominal variable is denominated in dollars. Patinkin (1965) began the effort to incorporate the nominal-real distinction into macro models. His model, however, did not incorporate Friedman's natural rate hypothesis, but instead retained the assumption of disequilibrium in the labor market that allowed aggregate demand policies to manipulate unemployment.

[20] These models determined real output and the real interest rate jointly as the outcome of market clearing where real output adjusts to generate savings equal to autonomous expenditures and the real interest rate adjusts to make real money demand equal to real money supply (given a fixed money stock and price level).

the unemployment rate if it was willing to tolerate inflation. In short, these models did not incorporate unique "natural" (full-employment) values of real variables such as real income, the real interest rate, and the unemployment rate.

To explain inflation, Keynesian models included an empirical relationship exhibiting a permanent inverse relationship between (high) inflation and (low) unemployment. The relationship took the name "Phillips curve" after the discovery of such an inverse relationship in British data by the British economist A.W. Phillips (1958). The explanation of inflation based on an empirical relationship between unemployment (a real variable) and inflation (a nominal variable) reflected the prevailing eclectic-factors view of the origin of inflation, that is, the absence of a unified monetary explanation. The common assumption at the time that a 4 percent unemployment rate represented full employment implied that there should be no "aggregate-demand" inflation with the unemployment rate above 4 percent. The inflation that did occur with an unemployment rate in excess of 4 percent then had to be of the "cost-push variety."[21] If inflation was cost-push as indicated by the simultaneous occurrence of high unemployment and inflation, policymakers could take stimulative policy actions without exacerbating inflation. The appropriate instrument for dealing with cost-push inflation was government intervention into the price-setting decisions of firms (incomes policies).

In *A Program for Monetary Stability*, Friedman (1960) had criticized activist aggregate demand policies with the "long and variable" lag argument. That is, the combination of the inability to forecast economic activity and the lags with which policy actions affect the economy renders destabilizing actions taken today to control real output. With his 1967 presidential address to the American Economic Association, Friedman (1968) expanded his critique of activist policy by giving empirical content to the monetary neutrality proposition of the quantity theory. He did so with his formulation of the "expectations-augmented" Phillips curve, which embodied the hypothesis that variation in the unemployment rate is related not to variation in the inflation rate, but to the difference between inflation and expected inflation.

Friedman ([1968] 1969, 102–4) wrote:

> [T]he Phillips curve can be expected to be reasonably stable and well defined for any period for which the average rate of change of prices, and hence the anticipated rate, has been relatively stable. . . . The higher the average rate of price change, the higher will tend to be the level of the curve. For periods or countries for which the rate of change of prices varies considerably, the Phillips curve will not be well defined. . . . [T]here

[21] Samuelson and Solow ("Analytical Aspects of Anti-Inflation Policy," 1960 in Stiglitz 1966) provided the first sort of analysis along these lines.

> is no permanent trade-off [between inflation and unemployment]. The temporary trade-off comes not from inflation per se, but from unanticipated inflation.

Friedman's hypothesis that monetary policy cannot systematically affect real variables took the name "natural rate hypothesis."[22] His specific formulation in terms of the "expectations-augmented" Phillips curve also became known as the accelerationist hypothesis: an attempt to target the unemployment rate will lead to ever-accelerating inflation or deflation, depending upon whether the Fed sets the unemployment target too low or too high. To use more recent terminology, the central bank cannot predictably control the values of variables determined by the real business cycle core of the economy, that is, the economy stripped of monetary nonneutralities.

Keynesians understood the quantity theory as the proposition that "in the long run" money is neutral. They thought of the quantity theory as little more than the "long-run" homogeneity postulate that an equiproportionate rise in all prices and in money leaves real variables unaltered (Samuelson and Solow, [1960] 1966, 1,337). Because they thought of policy as being made in a succession of short runs, there appeared to be little need to build monetary neutrality into models used for macroeconomic stabilization. The natural rate hypothesis as embodied in the expectations-augmented Phillips curve gave the quantity theory assumption of the neutrality of money specific empirical content by giving content to the distinction between long run and short run. The long run became the interval of time required for the public to adjust its expectations in response to a higher inflation rate. And, as Friedman argued, the speed of adjustment of the public's expectations depends on the monetary environment. "[I]n South American countries, the whole adjustment process is greatly speeded up" ([1968] 1969, 105).

Friedman's formulation of the natural rate hypothesis with the expectations-augmented Phillips curve yielded testable implications. Specifically, the Phillips curve relationship between inflation and unemployment would shift upward as trend inflation rose and expected inflation adjusted upward. As a result, higher inflation would not produce lower unemployment. Friedman offered an explanation for the observed inverse relationship between inflation and unemployment summarized by the Phillips curve that implied the disappearance of the relationship in response to sustained inflation. The stagflation of the United States in the 1970s validated that prediction. Friedman also predicted that even the short-run tradeoff would tend to disappear as the variability of inflation increased. That prediction received support

[22] See Friedman (1977) and Lucas (1996).

in studies across countries.[23] Finally, Friedman ([1973] 1975) predicted the failure of wage and price controls to control inflation.[24]

10. THE OPTIMAL QUANTITY OF MONEY

In addition to his theoretical critique of the Keynesian Phillips curve, Friedman ([1969] 1969) also made a contribution to the pure theory of money. He pointed out that the public can create real money balances costlessly by reductions in the price level. However, while real money balances are costless to create, individuals see an alternative cost of holding them equal to the nominal interest rate. Therefore, they hold fewer real money balances than are socially optimal. Friedman put the argument in terms of an externality. An individual's attempt to acquire an additional dollar of purchasing power will lower the price level. Because the individual does not benefit from the resulting capital gains other holders of money receive, he does not hold the socially optimal amount of purchasing power.

By setting money growth at a rate that causes a deflation equal in magnitude to the real rate of return to capital, the central bank can make the return to holding money equal to the return to holding bonds. With that rate of deflation, the nominal interest rate is zero. Friedman (1969, 34) wrote, "Our final rule for the optimum quantity of money is that it will be attained by a rate of price deflation that makes the nominal rate of interest equal to zero." [25]

11. STOP-GO MONETARY POLICY AND INFLATION

As a result of the effort begun in the mid-1960s by the Fed to manage the economy, money growth began to fluctuate irregularly around a rising trend line. Friedman consistently predicted the results. For example, at the Patman

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[23] See Lucas, "Some International Evidence on Output-Inflation Tradeoffs," 1973, in Lucas (1981).

[24] One of Friedman's contributions to economics was to formulate hypotheses in a way that stimulated further theoretical innovation. Muth (1960) applied the idea of "rational expectations" to address the optimality of Friedman's use of exponential weights on lagged income as a proxy for permanent income. Lucas formalized Friedman's theoretical critique of the Keynesian Phillips curve in two seminal papers. In his "natural-rate rational-expectations" formulation of the Friedman "expectations-augmented" Phillips curve, Lucas ([1972] 1981) applied Muth's idea of rational expectations to macroeconomics. He did so to address the "accelerationist" aspect of Friedman's formulation of the expectations-augmented Phillips curve. Lucas noted that with rational expectations, even accelerating money growth will not lower unemployment because the public will come to anticipate the acceleration. That is, can the Fed lower the unemployment rate persistently if it is willing to raise inflation indefinitely? Lucas ([1976] 1981) also generalized Friedman's critique of the Phillips curve as being a "reduced form" relationship dependent upon a particular past monetary policy rather than, as assumed by Keynesians, a "structural relationship" invariant to changes in monetary policy. For further discussion, see Sargent (1987).

[25] In this paper, as shown in the heading of the final section, "A Final Schizophrenic Note," Friedman (1969) did not intend this rule as a practical guide to policy.

Hearings in 1964, Friedman (1964 in U.S. Cong., 1,138) noted, "Over these nine decades, there is no instance in which the stock of money, broadly defined, grew as rapidly as in the past 15 months for as long as a year and a half without being accompanied or followed by an appreciable price rise." In the event, CPI inflation almost tripled, rising from 1.3 percent in 1964 to 3.6 percent in 1966.

Friedman gave force to his ideas by interpreting the events of the 1960s and 1970s as experiments capable of distinguishing monetarist from Keynesian ideas. He argued that the 1960s furnished the kind of controlled experiments necessary to distinguish whether the deficit exerted an influence on output independently of money. In 1966, Friedman argued that monetary policy was tight and fiscal policy expansionary. The economy slowed in 1967, as Friedman, but not Keynesians, predicted. In 1968, the situation reversed. Fiscal policy was tight because of the 1968 surtax and monetary policy was easy. The economy became overheated in 1968 and early 1969. Friedman (1970, 20) wrote:

> In the summer of 1968 . . . Congress enacted a surcharge of 10 percent on income. . . . [W]e had a beautiful controlled experiment with fiscal policy being extremely tight and monetary policy extremely easy. . . . [T]here was a contrast between two sets of predictions. The Keynesians . . . argued that the surtax would produce a sharp slow-down in the first half of 1969 at the latest while the monetarists argued that the rapid growth in the quantity of money would more than offset the fiscal effects, so that there would be a continued inflationary boom in the first half of 1969 . . . [T]he monetarists proved correct.

On August 15, 1971, President Nixon imposed wage and price controls. Friedman ([1971] 1972) forecast their eventual failure: "Even 60,000 bureaucrats backed by 300,000 volunteers plus widespread patriotism were unable during World War II to cope with the ingenuity of millions of people in finding ways to get around price and wage controls that conflicted with their individual sense of justice. The present, jerry-built freeze will be even less successful." Friedman ([1971] 1972) forecast that the Fed would cause the breakdown of the controls through inflationary monetary policy and successfully forecast the date when inflation would revive: "The most serious potential danger of the new economic policy is that, under cover of the price controls, inflationary pressures will accumulate, the controls will collapse, inflation will burst out anew, perhaps sometime in 1973, and the reaction will produce a severe recession. This go-stop sequence . . . is highly likely."

Once more, toward the end of the 1970s, Friedman ([1977] 1983) correctly forecast rising inflation:

> Once again, we have paid the cost of a recession to stem inflation, and, once again, we are in the process of throwing away the prize. . . . [Inflation] will resume its upward march, not to the 'modest' 6 percent the administration is forecasting, but at least several percentage points higher and possibly to double digits again by 1978 or 1979. There is one and only one basic cause of inflation: too high a rate of growth in the quantity of money.

12. RULES VERSUS DISCRETION

Friedman made a general case for conducting policy by a rule rather than through discretion in his essay, "Should There Be an Independent Monetary Authority?" He first repeated the standard argument for discretionary implementation of policy. Using the example of voting case by case on the exercise of free speech, Friedman (1962a, 239, 241) then offered a rebuttal that emphasized how a rule shapes expectations in a desirable way:

> Whenever anyone suggests the desirability of a legislative rule for control over money, the stereotyped answer is that it makes little sense to tie the monetary authority's hands in this way because the authority, if it wants to, can always do of its own volition what the rule would require it to do, and, in addition, has other alternatives; hence, "surely," it is said, it can do better than the rule.
>
> If a general rule is adopted for a group of cases as a bundle, the existence of that rule has favorable effects on people's attitudes and beliefs and expectations that would not follow even from the discretionary adoption of precisely the same policy on a series of separate occasions.

13. THE PERMANENT INCOME HYPOTHESIS

The idea had been around for a long time that an individual's consumption depends upon long-term income prospects or upon wealth rather than current income. Friedman (1957, ix), in particular, acknowledges Margaret Reid for ideas on the measurement of permanent income. Friedman's contribution was to give these general ideas empirical content by expressing them in a form capable of explaining a variety of data (cross-section and time-series) on consumption.

Friedman (1957, chap. 2) used the analytical framework of Irving Fisher (1907, 1930) to model how an individual distributes his consumption over time (given his endowments, preferences, and the interest rate). The interest rate is the intertemporal price of resources, which reconciles the household's desire to " 'straighten out' the stream of expenditures . . . even though its receipts vary widely from time period to time period" with the cost of doing so (Friedman 1957, 7). Friedman's formulation of the permanent income hypothesis made

him a pioneer in development of the optimizing framework that is the basis for modern macroeconomics.

Friedman gave Fisher's framework empirical content by modeling income as composed of uncorrelated permanent and transitory components, an idea borrowed from Friedman's earlier work, *Income from Independent Professional Practice*. According to Friedman's permanent income hypothesis, an individual's consumption depends only on the permanent component of income. Friedman also employed the hypothesis that individuals form expectations of the future as a geometrically weighted average of their past incomes.

In *A Theory of the Consumption Function*, Friedman (1957) used a single theory to explain why the savings ratio rises with income when income and consumption are measured with cross-section data, but remains constant when measured with time-series data. He argued that family budget studies show savings rising as a fraction of income as income rises because measured income includes transitory income. Some families with low measured income in a given year are experiencing temporarily low incomes, so they maintain their consumption at a relatively high level and conversely with families with transitorily high measured income. Consequently, the savings rate appears to rise with income. Aggregate data, however, show savings as a fraction of income remaining approximately constant at around 0.9 as income has risen secularly. Because transitory income averages out in this case, it does not bias the measure of the savings rate.

14. FREE MARKETS

Friedman defended free markets indefatigably and in every forum. Like Adam Smith, he explained how markets and the price system harness the efforts of individuals to better themselves in a way that improves the general welfare. More than any other individual over the post-war period, Friedman moved the intellectual consensus away from the belief that a rising standard of living rested on central planning to the belief that it rested on free markets.

Friedman advanced public understanding of the operation of markets through his free-market proposals to solve problems. His first collection of such proposals came in *Capitalism and Freedom* (Friedman 1962b). Although inevitably controversial, many of Friedman's proposals came to fruition. Examples are flexible instead of pegged exchange rates, elimination of the 1970s price controls on energy, a volunteer army, and auctions for government bonds. Some of his proposals have met with partial success. Examples are elimination of usury laws, a flat tax (1986 tax reform), free trade, indexing of the tax code for inflation (1981 tax changes), negative income tax (in the form of the Earned Income Tax Credit), and vouchers (in the form of charter schools). Some of his proposals have met with failure but have provoked useful debate.

Examples are the legalization of drugs and elimination of the postal monopoly on the delivery of first class mail.

There is no way to review succinctly Friedman's defense of free markets. A single example among countless must suffice. In congressional testimony, Friedman (U.S. Cong. 1964, 1,148–51) had the following exchange with a congressman over usury ceilings:

> Vanik: Is there not another way to stabilize interest rates simply by the establishment of national usury laws?. . . . [T]his is not price control. . . . It goes to our very heritage.
>
> Friedman: I believe that that is price control.
>
> Vanik: But it has its roots in morality.
>
> Friedman: No, I hope that Jeremy Bentham did not write in vain.
>
> Vanik: There is not any relationship between interest rates and human decency?
>
> Friedman: There may be a relation between a market in which interest rates are free to move and human decency. . . . I believe there is much evidence to support this belief, that such a limit will reduce it. . . . What happens, when you put on a usury law in any country, is that the borrowers who most need loans are driven to get the loans at much higher rates of interest than they otherwise would have to pay by going through a black market.
>
> Vanik: Does not a usury law have the effect of stabilizing the cost of money . . . ?
>
> Friedman: No, its only effect is to make loans unavailable. Consider price control in general. The effect of price control, if you set the price too low, is to create a shortage. If you want to create a shortage of loanable funds, establish a ceiling on interest rates below the market, and then you will surely do it.
>
> Vanik: [T]he whole thing is concerned with the economy, the way it is going to move along and expand, without the drag that high interest rates might impose on it.
>
> Friedman: I wonder if you would mind citing the evidence that high interest rates are a drag?
>
> Vanik: Well, I am not here answering the questions. . . . Now, you advocate surplus or at least sufficiency of the money supply but you have given us no assurance that it is going to be available . . . [at] any reasonable price. . . . [M]oney . . . differs from anything else—this is not wheat. This is not bread.
>
> Friedman: . . . [I]n a free market, the price rises because there is an increase in demand. If people . . . want to buy more wheat or more meat and this

> raises the price then such a rise in price is a good thing because it encourages production in order to meet the demand, and the same thing is true on the market for loans. . . . The second comment I would like to make is that one of the difficulties in our discussion is the use of the word "money" in two very different senses. In one sense, we use "money" to mean the green paper we carry around in our pockets or the deposits in the banks. In another sense, we use "money" to mean "credit" as when we refer to the money market. Now, "money" and "credit" are not the same thing. Monetary policy ought to be concerned with the quantity of money and not with the credit market. The confusion between "money" and "credit" has a long history and has been a major source of difficulty in monetary management.

15. CONCLUDING APPRAISAL

Societies develop a sense of shared identity through the way they interpret the dramatic events of the past. The interpretation of historic events requires ideas—the stock in trade of intellectuals. Milton Friedman became one of the most influential intellectuals in the 20th century because of the impact of his ideas in redefining views of the Depression and in shaping contemporary views of the Great Inflation from the mid-1960s through the early 1980s. The Depression represented not a failure of the capitalist system, but rather a breakdown in U.S. monetary institutions. The economic instability and rising inflation in the decade and a half after 1965 represented the stop-go character of monetary policy.

A major reason for Friedman's success as an economist was that he combined the intellectual traits of the theoretician and the empiricist. Theoreticians think deductively and try to understand the world around them in terms of a few abstractions. Empiricists think inductively and try to understand the world around them through exploration of empirical regularities. Friedman possessed both traits. Friedman's theoretical temperament appeared in his attraction to the logic of neoclassical economics. At the same time, Friedman forced himself relentlessly to formulate hypotheses with testable implications.

By 1950, Friedman had adopted two working hypotheses that guided his entire professional life. First, central banks are responsible for inflation, deflation, and major recessions. Second, the price system works well to allocate resources and maintain macroeconomic stability. For a quarter century after 1950, the consensus within the economics profession remained hostile to these ideas. A symbol of the triumph of the first principle came in October 1979 when FOMC chairman Paul Volcker committed the Fed to the control of inflation. A symbol of the second came in fall 1989 when the Berlin Wall fell.

Friedman applied the analytical apparatus of neoclassical economics indefatigably to understand the world. He was one of the great intellectuals of the 20th century in that he used ideas and evidence to change the way an in-

formed public understood the world. In his understanding of how competitive markets combine with individual freedom to better individual well-being and the prosperity of society, Friedman was a true heir of Adam Smith.

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