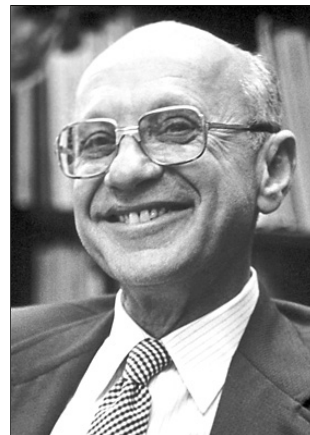


CHAPTER 1

MILTON FRIEDMAN

(1912 – 2006)

Milton Friedman of University of Chicago, Illinois, U.S.A., was awarded the 1976 Prize in Economic Sciences in memory of Alfred Nobel “for his achievements in the fields of consumption analysis, monetary history and theory, and for his demonstration of the complexity of stabilization policy.” His name is mainly associated with the renaissance of the role of money in inflation and the revival of interest and understanding of the instrument of monetary policy. He is also credited with being the architect of the Chicago school and with the coining of the now widely used terms “money matters” or “money alone matters.” His strong emphasis on money may be contrasted with a narrow interpretation of Keynes’s theory that for a long time “almost entirely ignored the significance of money and monetary policy” in the analysis of business cycles and inflation.



Friedman’s pioneering attack on the early post-Keynesian one-sidedness (extolling fiscal policy and underestimating the role of monetary policy) goes as far back as the early 1950’s. Thanks to Friedman’s brilliant espousal of the importance of monetary factors, the macro econometric models of 1970’s differed greatly from such models of the preceding two decades. The widespread debate on the theories put forward by Friedman had led to a review of monetary policies followed by central banks of developed countries, particularly the United States. The Royal Academy of Sciences while announcing the award to Friedman observes: “It is very rare for an economist to wield such influence, directly and indirectly, not only on the direction of scientific research but also on actual policies.”

Friedman had carried out a number of empirical studies that are both ‘original and weighty,’ in support of his analysis of the role of money in an economy. By putting forward a new formulation of the theory of the demand for money or liquid resources, he conducted empirical studies of the relationship between increases in money supply and the resultant changes in incomes and prices. His findings on the relevance of the quantity theory of money in explaining developments in the economy were based on the premise that the demand for money is very stable.

Friedman’s major work in the field of money is [A Monetary History of the United States 1867-1960](#). This work is widely regarded as one of Friedman’s “most profound and also

6 The Nobel Laureates and their Legacies: A Survey of Contributions to Economic Thought

most distinguished” achievements. The award citation specifically mentions: Most outstanding is perhaps his original and energetically pursued study of the crucial role played by the policy of the Federal Reserve System in the U.S. in sparking off the 1929 crisis and in deepening and prolonging the depression that ensued. Critics generally agree that this work of Friedman is a monumental scientific work which will long stimulate the re-examination of the course of events during this epoch.

Friedman’s refashioning of the theory of consumption is considered of great interest from purely scientific point of view. He had put forward “permanent income hypothesis” which postulated that what he called ‘permanent income’ and not year-to-year measured income is the prime determinant of households’ total consumption outlay. Friedman drew the “extremely valuable” distinction between temporary and permanent incomes of households. He had argued that a greater part of transitory income is saved than that of the permanent income.

Friedman’s studies of lags appearing in all areas of economic policy are another significant contribution. The Nobel award states that it was Friedman who coined the terms “observation lag,” “decision-lag” and “effect lag” to express a fundamental problem in regard to effectiveness of a policy that was neglected earlier; that is, the right timing for taking stabilisation measures during a business cycle. He had argued and had shown how changes in money supply could have a destabilising effect because of prolonged effect-lags of varying lengths. On the basis of his studies, Friedman drew a policy conclusion that monetary policy should be simplified and the goal of the monetary policy should be to ensure a long-run stable growth rate of the supply of money.

The Phillips Curve explanation of inflation that there is a permanent trade-off between unemployment and the rate of inflation was questioned by Edmund Phelps and Milton Friedman. However, Friedman was the first to demonstrate that the accepted assumption of a trade-off between unemployment and the rate of inflation was only a temporary phenomenon; no such trade-off exists in the long run. According to him, unemployment below a “structural” level of balance (referred to as “natural” level of unemployment) leads to a cumulative increased rate in prices and nominal wages, primarily due to the destabilising influence exerted by expectations. His hypothesis on the importance of inflationary expectations has strongly influenced the modern thinking regarding the factors determining the structure of wages in an economy.

Friedman was a pioneer among the economists who recommended in the beginning of the 1950s a reorganisation of the then existing international monetary system of fixed exchange rates to a system based on free exchange rates. Besides analysing the theoretical aspects of the problem, he used also empirical studies to evaluate how such a system could be made to work. He strongly opined that the Bretton Woods system characterised by relatively fixed exchange rates was bound to break down sooner or later.

1.1 A BRIEF BIOGRAPHICAL NOTE: MILTON FRIEDMAN

Milton Friedman was born on July 31, 1912 in Brooklyn, New York city. He was the son of a poor immigrant dry goods merchant, who died when Friedman was 15. Milton Friedman graduated (B.A.) at Rutgers University in 1932 and completed his M.A. at Chicago University the following year. Initially, Friedman specialised in Mathematics, intending to become an actuary, and went so far as to take actuarial examinations, “passing several but also failing several.” Shortly, however, he became interested in economics. After spending a year under a fellowship at Columbia University in 1933-1934, Friedman returned to Chicago as a research assistant to Henry Schultz to work on demand analysis until 1935, when he joined the staff of the U S National Resources Committee. He worked for the Committee from 1935 to 1937. From 1937, Friedman started his long association with the National Bureau of Economic Research (NBER), New York, which persisted until 1981.

Friedman was, for a brief period in 1940, a visiting professor of Economics at the University of Wisconsin. After a two-year stint (1941-1943) in the division of tax research of the U.S. Treasury, he became Associate Director of the Statistical Research group in the Division of War Research at Columbia University until the end of World War II. Spending a year as Associate Professor at the University of Minnesota, he returned to Chicago as Professor of Economics in 1946, the year in which he received a Ph.D. from Columbia University. At Chicago, he later became Paul Snowden Russell Distinguished Service Professor of Economics. He retired on January 1, 1977 to take up a position as Senior Research Fellow at the Hoover Institution at Stanford University.

His teachers at Rutgers were Arthur F. Burns and Homer Jones; at Chicago, Frank Knight, Lloyd Mints, Jacob Viner, Henry Schultz and Henry Simons; and at Columbia, Harold Hotelling, J. M. Clark and Wesley C. Mitchell.

Friedman stated in his autobiographical note: “The combination of Chicago and the Bureau [NBER] has been highly productive. At Chicago, I established a ‘Workshop in Money and Banking’ which has enabled our monetary studies to be cumulative body of work to which many have contributed...our work on monetary history and statistics has been enriched and supplemented by both the empirical studies and theoretical developments that have grown out of Chicago workshop.”

Friedman was President of the American Economic Association in 1967. He was conferred numerous honorary degrees. He was economic columnist for Newsweek for a long period (1966-1984). In 1988, he was awarded the Presidential Medal of Freedom and the National Medal of Science. He died at San Francisco, CA, on November 16, 2006.

1.2 A BRIEF SURVEY OF MILTON FRIEDMAN’S MAIN CONTRIBUTIONS

Friedman’s work is very vast and covers a wide and large number of fields including microeconomics, macroeconomics, monetary theory and policy, international monetary issues and methodology of economics. Any survey of his work has necessarily to be selective and cannot claim or pretend to be exhaustive even in the fields chosen for the

survey. As such, the survey presented here is brief and highly selective, given the self-imposed constraint of space. The present write up on the scientific contributions of Friedman is organised under the following heads.

1. Consumption Function;
2. Monetary Theory and Policy;
3. International Monetary Problems;
4. Microeconomics; and
5. Methodological issues.

1.2.1 CONSUMPTION FUNCTION

J.M. Keynes's central proposition in The General Theory of Employment, Interest, and Money is that in the short run as income of a household increases, other things being equal, its consumption also increases, but less than proportionately. That is, as income rises, consumers tend to save proportionately more and spend proportionately less. He also postulated that this relationship is sufficiently stable to form the basis for the multiplier through which an autonomous expenditure at the macroeconomic level "generated a considerably larger increase in real aggregate demand." Many subsequent empirical works (including that of Simon Kuznets) have demonstrated significant inconsistencies between the patterns of household behaviour from the time series data and from cross section data of household surveys. To resolve such observed inconsistencies, in the early post-Keynesian empirical work, economists like Duesenberry, Modigliani and Brown had introduced modification of the simple linear consumption function. Ms. Dorothy Brady, Ms. Rose Friedman and Tobin also effected modifications in their empirical studies. The modifications suggested that better empirical results were obtained when current income is supplemented with some measure of the previous highest income or consumption or with a wealth variable in explaining consumption expenditures of households.

Friedman argued that people adjusted their consumption with respect to variations in their long-term expected income or "permanent" income and ignored the transitory variations in income. Alan Walters comments: "This basic idea was not new--indeed it can be found in the 18th century writings of Bernoulli-- but Friedman's development showed his genius for simplicity and for the insights of thinking concretely.... The main quality of A Theory of the Consumption Function was the incomparable amassing, organization and interpretation of the evidence."

The permanent income hypothesis at the micro level may be summarised as follows, comprising a behavioural relationship supplemented by two definitions and some assumptions about the mutual independence of the variables that are included.

$$C_p = k(i, w, u) Y_p \quad (1)$$

$$Y = Y_p + Y_t \quad (2)$$

$$C = C_p + C_t \quad (3)$$

$$\rho(Y_p, Y_t) = 0, \bar{Y} = 0 \quad (4)$$

$$\rho(C_p, C_t) = 0, \bar{C} = 0 \quad (5)$$

$$\rho(Y_t, C_t) = 0 \quad (6)$$

where

Y: Personal disposable income

C: Consumption of non-durables and services plus use-value of consumer durables

ρ : Correlation coefficient

Barred variables represent mean values

C and Y stand for the household's consumption and income;

The subscripts p and t represent their permanent and transitory components. Permanent consumption is described as certain proportion, k, of permanent income, k depending on the rate of interest (i) at which consumers may borrow or lend, w represents the relative importance of property and non-property income, expressed by the ratio of non-human wealth to human wealth, and u the household's rate of time preference.

Equation (4) stands for the assumption that the permanent and transitory components of income and consumption are uncorrelated. Similar assumption is made in regard to the two transitory components.

Thus, Friedman hypothesises that in the system, there exists a stable relation between the two permanent components – permanent consumption and permanent income.

Incidentally, the above formulation of permanent income is a good example of the problem in econometrics of errors in variables. Friedman observed: "The estimation problem is the classical one of 'mutual regression' or regression 'when both variables are subject to error'." Friedman's definition of consumption excludes expenditures on major consumer durables and includes their own use value. Permanent income is measured as an exponentially weighted average of past measured incomes allowing for trend.

The empirical work of Friedman using cross section data yielded relatively low propensities to consume while analyses of aggregate time series gave much higher propensities to consume. Friedman had shown that these apparently conflicting results can be reconciled and can be shown to be consistent when the results are interpreted on the basis of permanent income hypothesis. Walters commends the integrity of Friedman's scholarship, particularly his diligent search to find evidence that would discredit the permanent income hypothesis. Walters further observes: "one of the great contributions of this book [A Theory of the Consumption Function] was to give a new standard for empirical economics generally. Clearly this was how it should be done."

10 The Nobel Laureates and their Legacies: A Survey of Contributions to Economic Thought

Thygesen of the University of Copenhagen is of the view that “the permanent income hypothesis and the particular choice made by Friedman in defining the empirical counterparts to his theoretical constructs has had a profound impact on empirical work on the consumption function. Its great appeal was due to the rare combination of simplicity with a wide range of testable propositions.” Another important impact of Friedman’s work was the introduction of the concept of permanent income into many fields of applied economics, such as monetary economics, international trade, transportation and housing.

The verdict, nearly forty years later, is that the permanent income hypothesis has left a “profound mark” on subsequent work in the field of consumer behaviour. Thomas Sargent is of the view that “the basic insight of the permanent income model is that in response to a possibly erratic and unsmooth income stream, consumers would optimally smooth their consumption streams by borrowing and lending or by physically investing.”

1.2.2 MONETARY THEORY AND POLICY

Friedman’s rise to fame and his attainment of prominence in the economics profession and outside was primarily as a monetary theorist. It is rather difficult to separate the theoretical aspects of Friedman’s work from his empirical contributions in the field of monetary economics as the two are quite intertwined in his work. As will be discussed later in the section on methodological issues, Friedman was strongly of the view that for testing economic theory one has to use the implications rather than assumptions. In 1950s many economists, particularly of Keynesian hue, ridiculed the quantity theory of money as a mere tautology. Furthermore, the most important conclusion that had emerged from the Radcliffe Committee Report, 1959, was that the quantity of money was of little or almost no interest since the velocity of circulation of money has practically no limits. The Report expressed the view that the central bank has to watch the rates of interest in the economy rather than the quantity of money for the purpose of evaluating the efficacy of monetary policy.

The quantity theory of money was empirically tested extensively over several critical periods of change by many economists, among whom should be prominently mentioned Irving Fisher, J. M. Keynes and Clark Warburton. However, the methodology they used was considered “murky”, the statistics termed “slim” and inter-relationships between data and theory were described as rather “obscure”. Since 1950, “intensive” empirical work was undertaken by Friedman and his associates in the Workshop in Money and Banking at the University of Chicago and in the National Bureau of Economic Research (NBER). In Studies in the Quantity Theory of Money, Friedman and his co-authors postulated that the demand for money by individual households is a stable function of its money income (later amended as a function of permanent income or wealth), cost of holding money represented by the rate of interest and the expected rate of inflation. To ultimate wealth holders (individuals and families), the stock of money yields a flow of consumption services while to non-financial business firms it yields a flow of productive services. The theory of demand for money in Friedman’s formulation is analogous to the theory of demand for a

durable consumer good or capital good. Friedman asserted that the quantity theory was in the first instance a theory of the demand for money. It is not a theory of output, or of money income, or of the price level.

Friedman gave the following equation which expresses the demand for real balances as a function of “real” variables independent of nominal/ monetary values.

$$\frac{M}{P} = f\left(r_b, r_e, \frac{1}{\rho} \frac{dP}{dt}, W, \frac{Y}{\rho}, u\right)$$

where

r_b and r_e are real rates of return on bonds and equities

$\frac{1}{\rho} \frac{dP}{dt}$ is rate of change of price level,

$\frac{Y}{\rho}$ is the real income

W is ratio of income from non-human wealth to income from human wealth; and

u stands for utility determining variables.

Friedman’s presentation of the theory of the demand for money in the first essay in the Studies in Quantity Theory is “one of his most widely quoted papers.”

The main criticism of Friedman’s restatement as presented by Bent Hansen and Don Patinkin was that Friedman’s formulation is not in the tradition of quantity theory; it was essentially Keynesian in spirit. It would have been difficult to conceive of it without Keynes. As Alan Walters aptly puts it “Friedman was a closet Keynesian.” It is said that Friedman’s “Restatement” can be considered as a generalisation of Keynesian monetary theory by enlarging the range of assets beyond long-term securities and money. By including real assets in the demand function for money and transforming it into a portfolio choice, Friedman brought in the role of price expectations in financial behaviour in the tradition of Irving Fisher. The other essays in The Studies, notably Cagan’s on hyperinflation (in which movements in price expectations variable swamp the effect of other determinants) and Selden on Velocity, underscored the importance of examining nominal income and inflation in the context of the demand for money. The seminal contribution the volume made was the need for incorporation of inflationary expectations into the demand for money. The later empirical work attests this point.

Though, the theoretical framework put forward by Friedman received, by and large, general acceptance, the equation employed by Friedman for empirical work of the demand for money consisting of a few variables was less acceptable. Friedman believed that, in practice, the demand for money function to be stable in a small number of variables. He believed that, in practice, the degree of substitutability between money

12 The Nobel Laureates and their Legacies: A Survey of Contributions to Economic Thought

proper and any one of the near-money assets is low. He categorically rejected the Keynesian view of a very high elasticity of demand for money with respect to yield on long-term securities, the so-called liquidity trap. Later, he moved away from this extreme position as, according to him, “no fundamental issues,” in either monetary theory or monetary policy hinge on whether the estimated elasticity can for most purposes be approximated by zero or is better approximated by -0.1 or -0.5 or -2.0 , provided it is seldom capable of being approximated by ∞ . The direction of causation remained an unanswered issue in Friedman.

The direction of causation remained an unanswered issue in Friedman’s work. Specifically, the crucial issue is: whether prices and output respond to endogenous changes in money supply or whether stock of money is passively accommodating to changes in nominal income or wealth? According to the Chicago Workshop, the answer to such questions should be sought from a careful and diligent research into the history of the monetary process. One important factor which was noted by the Workshop relates to the role played by the exchange rate and the balance of payments. Friedman was clear that a stable growth of money supply was unlikely to be feasible under a fixed exchange rate regime.

Despite the increasing attention devoted to the issue of the balance of payments and the money supply process by the profession, Friedman’s main focus in his work was on the examination of the effects of changes in money supply on nominal income, prices and output. In the words of Walters “the main questions were: (a) what was the relative importance of money compared with fiscal variations (the Keynes.vs.Monetarist debate) (b) what was the time pattern of adjustments; and (c) could expansionary financial or fiscal policies affect real output in the short or long run?”

The answers to these three questions that have emerged from Friedman’s empirical work are:

Increased deficit has an impact effect on nominal income; it does not last; it soon disappeared. On the other hand, an increased rate of the growth of money stock has a lasting effect in raising the inflation rate, though with a lag.

The lag in the impact of increased growth rate of money and nominal income is long and variable; and in the long run, the increased growth of money stock has no effect on the level of output or its growth rate but only on the inflation rate.

Friedman’s important empirical finding is that variations in the rate of growth of money supply has short run real output effect as also price effects; however, in the long run, the only “substantial” effect is on prices in the economy. It appears from a reading of the relevant literature that Friedman’s finding in respect of the long run has received wide acceptance of the profession. However, this is not so for his claims in regard to short-run effects – the relative ineffectiveness of fiscal policy as a counter-cyclical policy measure and the large but unpredictable effects of variation in money stock on real output and employment.

Two papers of Friedman with his associates, the first one written in collaboration with David Meiselman (“The Relative Stability of Monetary Velocity and the Investment Multiplier in the United States, 1897-1958”) and the second paper co-authored with Anna J. Schwartz (“Money and Business Cycles”), present Friedman’s position on the nature of the transmission mechanism from changes in money stock to the market for current output. The conclusions Friedman and his co-authors drew in this regard are considered as subsequent rationalisations, “almost as an afterthought.” Critics allege that the processes of monetary transmissions as put forward by Friedman and his associates are “black boxes” with no precise formulation of the way in which money works in the economy in bringing about the effects.

Critics of Friedman’s work on money point out the lack of a sound theoretical structure. To meet such criticism, Friedman made an attempt to put forward theoretical underpinnings for his approach to research on money in Milton Friedman’s Monetary Framework. In this publication, he gave a basic model comprising seven equations of a closed economy. He asserted that the critical difference between the quantity theory or classical model and the Keynesian model lies in the choice of the last equation. Friedman stated that the classical economists hypothesised that the model determines the general price level and the level of real output was determined by factors such as technology and skills. On the other hand, Keynesians supply an equation that specifies the determination of prices as being influenced by exogenous forces and the level of aggregate demand as a factor determining the output level. Neither economists adhering to the quantity theory approach nor those who belonged to the Keynesian group accepted the simple model contained in the Framework. Furthermore, model was found to be deficient in that it failed to provide a sound basis for the dynamics of adjustment to the long run equilibrium through price, output and interest effects. As Walters appropriately comments: “The transmission mechanism and dynamics remain enshrouded in the gloom of a black box.”

Most of Friedman’s empirical work relating to money and monetary policy is essentially one enormous research project at the National Bureau of Economic Research (NBER). One topic is the definition of money and determination of the group of financial assets that can be categorised as money. On the issue of definition Friedman adopts a pragmatic attitude. As he was interested in the interrelationship between money and income, the criterion he adopted is the ability of various measures to predict changes in money income or induced expenditures. The two main contenders are the narrow money stock (M1) comprising currency outside commercial banks plus demand deposits with commercial banks after appropriate adjustment for government deposits and inter-bank claims and the broad money stock (M2) consisting of M1 plus time deposits with commercial banks. The broad definition was preferred on the basis of the simple criterion of the correlation in a regression of various measures of income on money. Friedman emphasised the tentative nature of this choice: “...the selection of a specific empirical counterpart to the term money seems to us a matter of convenience for a particular purpose, not a matter of principle. Dogmatism is out of place.” On the position of Friedman, Tobin commented:

14 The Nobel Laureates and their Legacies: A Survey of Contributions to Economic Thought

“We don’t know what money is, but whatever it is, its stock should grow steadily at 3 to 4 per cent per year.”

As regards the determinants of money stock and its independence of current income, Friedman (jointly with Schwartz) and Cagan have analysed in great detail. They identify the triad of factors as the three “proximate determinants” of the money stock: the stock of high powered money or monetary base, the reserve ratio of the commercial banks and the ratio of currency to bank deposits in the portfolios of the public. The first one represents the behaviour of the central bank or monetary authorities, the second one of the commercial banks and the last and third one of the non-bank public.

It is a considered view of many economists that the NBER volumes co- authored by Friedman and Schwartz (A Monetary History of the United States, 1867-1960; and Monetary Statistics of the United States) present a strong case for the view that high-powered money, which has been the dominant longer-run influence on the money stock, moved basically independently of current income. They also demonstrate that “even in the great contraction of 1929-1933, money was not an endogenous element that adapted largely in a passive way to a decline in commodity markets brought about by other factors.” Friedman was of the view that monetary policy was a factor that speeded up the decline in the economic activity in the U.S.: “it [the money stock] fell because the Federal Reserve System forced or permitted a sharp reduction in the monetary base, because it failed to exercise the responsibilities assigned to it in the Federal Reserve Act to provide liquidity to the banking system. The great contraction is tragic testimony to the power of monetary policy – not, as Keynes and so many of his contemporaries believed, evidence of impotence.”

Friedman’s paper jointly written with David Meiselman (a reference to which has been made earlier) is a frontal attack on the Keynesians. The paper empirically tested simple Keynesian income-expenditure model and the money velocity model in the linear form for the levels and changes in the variables with annual data for a fairly long period, 1897-1958. The authors’ conclusion is striking: for every decade except the 1930s and for the period as a whole the money stock was clearly superior to autonomous expenditure in explaining consumption. Friedman stated that the verdict was “strikingly one-sided.” It is Thygesen’s view that “it is possible to argue in retrospect that this is the single most influential study among Friedman’s many publications.” To counter Friedman’s view, Keynesians built larger and larger econometric models, such as FMP (Federal Reserve Board, Massachusetts Institute of Technology and University of Pennsylvania) model. Likewise, it paved the way for a number of small-scale “monetarist” models such as St. Louis Model.

In his later work on monetary theory and policy, Friedman attempted careful analysis of timing patterns. He devoted considerable attention to the problem of time lags between variations in the money stock and in money or nominal income. On the basis of his empirical work relating to time lags, Friedman drew an important conclusion. It is that

“fine tuning” in the form of frequent discretionary changes in M2 designed to keep the economy on course is not possible. As he found that the lags were not merely long but they were seen to be of unpredictable length, the variation in monetary policy as a part of active stabilisation policy is likely to be “inappropriate” to the situation. Despite strong criticism of Friedman’s methodology on several points, Friedman’s policy advice had remained the same. He was against discretionary monetary policy because of his belief that knowledge of time lags between monetary policy actions and their effects were not sufficiently precise to expect any stabilising role from the discretionary policy. Instead, he championed a “monetary rule” in the form of a steady rate of growth of money stock corresponding roughly to the growth of capacity output. It is to be remarked that perhaps, no aspect of Friedman’s writings is more controversial than the “monetary rule” of steady growth in the money stock.

In his presidential address to the American Economic Association which Walters considers the most important and influential paper in macroeconomics in the post-war years, Friedman argued that the view of macroeconomic policy as a trade-off between unemployment and inflation (the Phillips curve approach) is fundamentally flawed. Friedman’s argument was that “...there is always a temporary trade-off between inflation and unemployment; there is no permanent trade-off. The temporary trade-off comes not from inflation per se, but from unanticipated inflation.” In Walter’s words: “The so-called Phillips curve was a short-term temptation rather than a long-term choice.” Thus, according to Friedman, the long-run Phillips curve was vertical. Friedman called this level of unemployment as the “natural rate” (a Wicksellian term). The natural level of unemployment, according to Friedman, was determined by the nature of labour markets. Throughout the 1960s, the trade-off between unemployment and inflation appeared more and more illusory – unemployment rose but inflation had shown no abatement; it had, in fact, shown an increase. We could do no better than quote Walters again: “Like Keynes’s General Theory, it was one of the very few contributions that changed, both the approach of professional economists and the policies adopted by finance ministers.” Friedman contended that attempts at diverging from the “natural” level can only succeed temporarily and at considerable cost in terms of subsequent adjustment. “It [the monetary authority] cannot use its control over nominal quantities to peg a real quantity – the real rate of interest, the rate of unemployment, the level of real national income, the real quantity of money, the rate of growth of real national income or the rate of growth of the real quantity of money.”

Thomas Sargent considers that Friedman’s Presidential address to the American Economic Association as “the opening shot of ‘rational expectations revolution’ in macroeconomics.... Subsequent work on the natural-rate hypothesis has strengthened Friedman’s original vision. In raising the possibility that the data could be rendered consistent with a dynamic model in competitive equilibrium, Friedman began a re-birth of equilibrium macroeconomics.”

16 The Nobel Laureates and their Legacies: A Survey of Contributions to Economic Thought

Friedman's "The Optimum Quantity of Money," is viewed by many economists as building upon the ideas of Henry Simons and Lloyd Mints regarding Chicago Plan of Banking Reform and is considered important both substantively and methodologically. Thomas Sargent argues that if Friedman's model is modified by formulating that the only taxes available to the government are distortionary ones, "...one discovers a version of Finn Kydland and Edward Prescott's (1970)' time inconsistency' problem."

1.2.3 INTERNATIONAL ECONOMIC PROBLEMS

Friedman's outstanding contribution to the field of international economics was his advocacy of flexible foreign exchange rates. In 1950, when the orthodoxy of fixed exchange rates was well and truly established, Friedman wrote a fairly long essay titled "The Case for Flexible Exchange Rates" during a consultancy for the Economic Cooperation Administration. The essay was later included in his 1953 book, Essays in Positive Economics.

In the paper, Friedman examined the arguments put forward by Nurkse, among others, that flexible exchange rates are likely to encourage destabilising speculation. In reply, Friedman advanced two main arguments.

1. The implication that flexibility in exchange rates would encourage destabilising speculation is that speculators, on the average, would lose money. According to Friedman, this appears to be unlikely.
2. There was no evidence available at that time in favour of this proposition.

Friedman and Schwartz in A Monetary History...showed that the United States' experiences with floating exchange rates between 1862 and 1879 did not encourage speculation of a destabilizing type.

Furthermore, Friedman was of the view that floating dollar is eminently sensible for the U.S. to achieve domestic policy objectives in the backdrop of the fact that 95 per cent of the output produced was for domestic use. He had therefore welcomed the shift in the U.S. economic policy in regard to exchange rates since 1971.

The extent of his understanding of practical problems of international finance is very much evident in his 1969 article titled "The Euro-Dollar Market: Some First Principles." In the article, Friedman developed the analogy of credit creation in a domestic banking system to the operation of the Euro-dollar market.

1.2.4 MICROECONOMICS

In the field of microeconomics, Friedman had made significant contributions. His two papers with L.J. Savage relating to the utility analysis of risk and the measurement of utility based on the work of von Neumann and Morgenstern are particularly noteworthy. The authors, making use of acceptable axioms, showed that choice under conditions of uncertainty could be represented as a process of maximising expected utility. Specifically, the authors stated that the utilities of each of the expected outcomes are weighted by the

probability of occurrence of that outcome and the sum gave an index of expected utility. Given the axioms, an individual would maximise the index of expected utility by choosing from the alternative uncertain prospects.

While the basic idea was developed originally by Bernoulli in solving the St. Petersburg Paradox, the contribution of Friedman and Savage lay in discovering new insights and implications with wide-ranging applications. The expected utility hypothesis had attempted at reconciling the wide-spread practice of simultaneously gambling and insuring. In addition, the hypothesis has a “profound effect” on the theory and practice of portfolio selection. It has also offered for the pure economic theorist an attractive proposition that up to an arbitrary linear transformation of origin and scale, utility has to be regarded as a cardinal magnitude. While subsequent work of economists, particularly Maurice Allais threw some doubt about the plausibility of one of the axioms and applicability of the expected utility hypothesis in some specific fields, the hypothesis still forms a cornerstone of all work in choice under conditions of uncertainty. It is commented that these two papers of Friedman (co-authored with Savage) mark “the last contributions of Friedman to the pure theory of statistics and decision-making.”

Another outstanding contribution of Friedman to microeconomics concerned his reformulation of Marshallian demand theory as a practical instrument of analysis. This contribution is regarded as “meticulous scholarship” in the history of economic thought. It favoured approaching demand analysis as a positive rather than as a normative discipline.

Friedman in his lectures on price theory at the Graduate School of University of Chicago highlighted the uses and some abuses of the theory of price. His lectures opened up to students “new vistas – such as the theory of human capital – and exciting ways of unravelling puzzles and resolving problems.” Walters says: “in his hands, economics had both power and point, and reality and relevance.... Friedman showed how to interpret simple ideas in a most sophisticated way.”

1.2.5 METHODOLOGICAL ISSUES

From the very beginning, Friedman made clear his methodological position. In the essay “The Methodology of Positive Economics,” he urged using the implications rather than the assumptions as testing ground for economic theory. For judging the usefulness of a theory, the realism of the assumption is not a good criterion. The conformity of assumptions with reality “...promotes misunderstanding about the significance of empirical evidence for economic theory, produces a misdirection of much intellectual effort devoted to the development of positive economics, and impedes the attainment of consensus on tentative hypotheses in positive economics.” The prime issue in evaluating the usefulness of the theory, according to Friedman, is whether it yields predictions that are sufficiently accurate for the purpose at hand.

According to Thygesen “The ‘as if’ hypothesis is essential to an understanding of Friedman’s subsequent empirical work, particularly in the field of monetary theory and

policy.” For example, in choosing between various possible empirical counterparts to the theoretical concepts of money, Friedman was guided by the reliability of the linkages of variations in various empirical constructs to movements in money income and prices rather than by the ‘a priori’ notions of the functions performed by money.

Many economists point out that the possibilities of testing either the assumptions or the implications of economic theory are limited. Friedman’s position has been criticized by several economists, one of the prominent among them being Paul Samuelson. Samuelson noted that the distinction between assumptions and implications disappears in a well-developed theoretical structure.

In his recent comments on methodology, Friedman considered himself as working in Marshallian tradition (in contradistinction to the Walrasian tradition) who regarded economic theory as “an engine for the discovery of concrete truth.” Friedman shared with Keynes and some of the Keynesian economists, such as Kaldor and Davidson, scepticism towards general equilibrium economics.

Friedman’s work on money is a brilliant application of his methodology of positive economics.

1.3 CONCLUDING OBSERVATIONS

In addition to the areas surveyed above, Friedman contributed to a number of other fields. They are revealed in his more popular writings on issues such as public spending, price and rent controls and taxation. The conventional view is that he had been one of the most ardent, most effective and most persuasive advocates of free enterprise and monetarist policies. He was universally regarded as the founder and leading proponent of “Monetarism,” an economic doctrine which considers supply of money and changes therein to be the primary determinant of nominal income and prices in the economy. In his appearances in the various media, Friedman had been “a great persuader, his role being critical in promoting such ideas as an all volunteer army, the voucher schemes for education and health, and indexing income tax.”

Reverting to the issue of relation between inflation and unemployment, Friedman traced the professional views on the topic during 1950s, 1960s and 1970s and stated that they have gone through two stages and are now (Nobel lecture was in 1976) entering a third. The first stage was the acceptance of a stable trade-off (a stable Phillips Curve). The second was the introduction of inflation expectations, as a variable causing a shift in the short-run Phillips Curve and of the natural rate of unemployment, as determining the location of a vertical long-run Phillips Curve. The third is occasioned by the empirical phenomenon of an apparent positive relation between inflation and unemployment.

Elaborating on them in his Lecture, Friedman remarked that the Phillips Curve hypothesis that there is a stable relation between the level of unemployment and the rate of inflation was adopted by the economics profession with alacrity. It seemed to provide

reliable tool for economic policy. He went on further: “As in any science, so long as experience seemed to be consistent with reigning hypothesis it continued to be accepted.”

As time passed, it seemed to take larger and longer doses of inflation to keep down the level of unemployment. “Stagflation reared its ugly head.” Attempts to patch up the hypothesis did not yield satisfactory results. A radical revision of the hypothesis was needed. The attempts at revision underlined the importance of surprises; that is, differences between anticipated and actual magnitudes. Friedman put forward the idea that natural rate of unemployment at any time is determined by real factors. He asserted that this natural rate would tend to be attained when expectations were, on the average, realised. Thus, the natural rate hypothesis of Friedman and Phelps contains the original Phillips curve hypothesis as a special case and rationalises, say, the phenomenon of stagflation.

Friedman observed that the natural rate hypothesis “in its present form has not proved rich enough to explain a more recent development – a move from stagflation to slumpflation.” That is, higher inflation is associated with higher unemployment. This situation may have come about because of events such as oil crisis. A major factor in some countries and a contributing factor in others may be that they are in a “transitional period – this time to be measured by quinquennia or decades, not years. The public has not adapted its attitude or its institutions to a new monetary environment.”

Government’s macroeconomic policy, specifically relating to inflation and unemployment has responded almost entirely to the force of events: brute experience proved far more potent than the strongest of political or ideological preferences. Friedman then remarked: The importance for humanity of a correct understanding of positive economic science is vividly brought out by a statement made nearly two hundred years ago by Pierre S. du Pont to the French National assembly and he quoted: “...It is necessary to be gracious as to intentions, ...but we do not have to be gracious at all to inconsistent logic or to absurd reasoning. Bad logicians have committed more involuntary crimes than bad men have done intentionally.”

To a non-specialist reader, or general public, some of the most interesting publications of Friedman (singly or jointly with his wife Rose Friedman) include Capitalism and Freedom, Free to Choose and Tyranny of the Status Quo.

In Friedman’s essay included in the Lives of the Laureates, Friedman stated that he had been enormously impressed by the role that pure chance plays in determining one’s life history. He confessed: “By accident, I also took some courses in economics, and that is where the goddess of chance entered the picture, because the Rutgers economics faculty included two extraordinary teachers [Arthur F. Burns and Homer Jones] who had a major impact on my life.” He concluded the essay with the following observations: “...my life as an economist has been the source of much pleasure and satisfaction. It is a fascinating discipline. What makes it most fascinating is that its fundamental principles are so simple

20 The Nobel Laureates and their Legacies: A Survey of Contributions to Economic Thought

that they can be written on one page, that anybody can understand, and yet that very few do.”

Paul Krugman compares the 20th century economic thought to the history of Christianity in the sixteenth century. He says that until the publication of Keynes’s General Theory in 1936, economics was completely dominated, at least in the English-speaking world by ‘free-market orthodoxy.’ Heresies that occasionally popped up were systematically suppressed. In 1936, Keynes wrote, Classical economics “conquered England as completely as the Holy Inquisition conquered Spain.”

However, with the onset of the Great Depression and the failure of Classical economics to provide either explanations or solutions for it, “the challenges to orthodoxy could no longer be contained.” Krugman carries the religious analogy further. He continues: “Keynes played the role of Martin Luther, providing the intellectual rigor needed to make hearsay respectable.” Keynes argued that free markets could not be relied upon to provide full employment and created “a new rationale for large-scale government intervention in the economy,” Krugman observes:

“Keynesianism was a great reformation of economic thought. It was followed, inevitably by a counter-reformation.... If Keynes was Luther, Friedman was Ignatius of Loyola, founder of Jesuits. And like the Jesuits, Friedman’s followers have acted as a sort of disciplined army of the faithful spearheading a broad, but incomplete, rollback of Keynesian hearsay. By the century’s end, classical economics had regained much though by no means all of its former dominion, and Friedman deserves much of the credit.”

Friedman had contributed to the advancement of economics in at least four ways, according to Thygesen. He had reformulated the theory of the consumption function by his permanent income hypothesis. He had initiated an important debate about the scope for discretionary action in monetary and fiscal policy. He had “forced the re-evaluation” of important phases of economic history of the United States through his stupendous and massive work with historical monetary statistics. He revived interest in the methodological issues in economics. Critics talk about Friedman’s influence well beyond the academic. His greatest asset is his ability to formulate powerful hypotheses in the simplest terms. His work on money for over thirty years gave direction to the profession that monetary economics is to be interpreted as part of the central corpus of price theory.

Friedman’s work is seemingly simple, eschewing complexities, concentrating on essentials; all combined into a lucid exposition. He believed that economics should be viewed as an empirical science. We cannot do better than conclude this essay with Walter’s and Sargent’s assessments; “In effectiveness, breadth and scope, his only rival among the economists of the 20th century is Keynes.”(Walters)

“Many very good researchers continue to pay Milton Friedman of thinking hard about issues that he posed, often in terms that he defined, and using methods that he invented or inspired.”(Sargent).

1.4 SELECT BIBLIOGRAPHY OF MILTON FRIEDMAN'S WORKS

1.4.1 BOOKS

- 1945 (with Simon Kuznets) Income from Independent Professional Practice, NBER, New York.
- 1953 Essays in Positive Economics, Chicago University Press, Chicago, Ill.
- 1956 (ed.) Studies in the Quantity Theory of Money, Chicago University Press, Chicago, Ill.
- 1957 A Theory of Consumption Function, Princeton University Press, Princeton, NJ.
- 1959 A Program for Monetary Stability, Fordham University Press, New York.
- 1962 a Capitalism and Freedom, University of Chicago Press, Chicago, Ill.
b Price Theory: A Provisional Text, Aldine Publishing Co., Chicago, Ill.
- 1963 (with A. J. Schwartz) A Monetary History of the United States, 1867-1960, Princeton University Press for NBER, Princeton, NJ.
- 1967 (with R. V. Roosa) The Balance of Payments: Free versus Floating Exchange Rates, American Enterprise Institute, Washington D.C.
- 1968 Dollars and Deficits: Inflation, Monetary Policy and the Balance of Payments, Prentice-Hall, Englewood Cliffs, NJ.
- 1969 The Optimum Quantity of Money and Other Essays, Aldine Publishing Co., Chicago, Ill.
- 1970 (with A. J. Schwartz) Monetary Statistics of the United States, Columbia University Press for NBER, New York.
- 1973 Money and Economic Development, Horowitz Lectures of 1972, Praeger, New York.
- 1976 Price Theory (Revised and Enlarged Version of the 1962 edition), Aldine Publishing Co., Chicago, Ill.
- 1980 (with R. Friedman) Freedom to Choose, Harcourt, Brace, Jovanovich, New York.
- 1982 (with A. J. Schwartz) Monetary Trends in the United States and the United Kingdom, University of Chicago Press for the NBER, Chicago, Ill.
- 1984 (with R. Friedman) Tyranny of the Status Quo, Harcourt, Brace, Jovanovich, New York.

1.4.2 ARTICLES

- 1948 (with L.J. Savage). "The Utility Analysis of Choices Involving Risk," JPE, Vol. 56, Aug.
- 1949 "The Marshallian Demand Curve," JPE, Vol. 57, Dec.

22 The Nobel Laureates and their Legacies: A Survey of Contributions to Economic Thought

- 1952 (with L. J. Savage) "The Expected Utility Hypothesis and the Measurability of Utility," JPE, Vol.60, Dec.
- 1963 (With D. Meiselman), "The Relative Stability of Monetary Velocity and the Investment Multiplier in the United States, 1897-1959," in Stabilization Policies, Commission on Money and Credit, Prentice-Hall, Englewood Cliffs, NJ.
- 1968 "The Role of Monetary Policy," Presidential Address, American Economic Association, AER, Vol.58, Mar.
- 1977 "Inflation and Unemployment," Nobel Lecture, JPE, Vol.85, No.3.
- 2004 Friedman's Essay in Lives of the Laureates: Eighteen Nobel Economists, (Eds. W. Breit and B.T. Hirsch) Fourth Edition, The MIT Press, Cambridge, MA.

1.5 WORKS OF OTHERS

- Brunner, K and A. H. Meltzer (1972) "Friedman's Monetary Theory," JPE, Vol. 80, Sept/Oct.
- Davidson, P. (1972), "A Keynesian View of Friedman's Theoretical Framework for Monetary Analysis," JPE, Vol. 80, Sept/Oct.
- Gordon, R.J.(1974), Milton Friedman's Monetary Framework: A Debate with his Critics, Edited and with an Introduction by R. J. Gordon, University of Chicago Press, Chicago, Ill.
- Hahn, F. (1971), "Professor Friedman's Views on Money," Economica, New Series, Vol. 38, Feb.
- Johnson, H (1971), "The Keynesian Revolution and the Monetarist Counter Revolution," AER, Vol. 61, May.
- Patinkin, D (1972), "Friedman on the Quantity Theory and Keynesian Economics," JPE, Vol.80, Sep/Oct.
- Thygesen, N. (1977), "The Scientific Contributions of Milton Friedman," ScandJE, Vol.79, No.1.
- Tobin, J. (1965), "The Monetary Interpretation of History," AER, Vol. 55, June.
- Tobin, J. (1972), "Friedman's Theoretical Framework," JPE, Vol.80, Sept/Oct.
- Walters, A. A. (1965), "Professor Friedman on the Demand for Money," JPE, Vol. 63, Oct.
- Walters, A. A. (1987) "Milton Friedman," The New Palgrave: A Dictionary of Economics, Macmillan, London.