

THE QUANTITY THEORY OF MONEY:
TWO CONTRASTING APPROACHES

by

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I. INTRODUCTION

As in any empirical science, progress in economics comes about through continual interaction of observation, proceeding from the casual to the systematic, and reasoning, proceeding from the incidental to the more general and formal.¹ Thus, sciences start at a "common - sense" level and build: (a) downwards their foundations, and (b) upwards their structure of laws.² With respect to (a), common - sense notions must be made precise to assure a logically firm and secure basis for the superstructure. No matter how rigorous a system is, it can still be naive and irrelevant, thus yielding misleading conclusions, if there is no truth to begin with.³ With respect to (b), unless rigor follows along to consolidate the gains in realism, it will not be known which conclusions or recommendations depend on which postulates and which postulates depend for their validity on which verifications of their implications by accumulated experience.⁴

¹Tjalling C. Koopmans, Three Essays on The State of Economic Science (New York: McGraw-Hill, Inc., 1967), pp. 130-131.

²T. W. Hutchinson, The Significance and Basic Postulates of Economic Theory (London: Macmillan and Co. Ltd., 1938), p. 16.

³William J. Baumol, Economic Models and Mathematics, Essay 6 in The Structure of Economic Science, ed. by S. R. Krupp (16 essays; Englewood Cliffs: Prentice-Hall, Inc., 1966), p. 94.

⁴Koopmans, The State of Economic Science, p. 143.

The following paper makes a methodological comparison of the classical and Milton Friedman's quantity theories of money. Hopefully, it will be shown that the development of econometrics together with improvements in data have made more effective tests of hypotheses feasible, and has contributed to more fruitful model building.

II. CLASSICAL METHODOLOGY AND THE QUANTITY THEORY OF MONEY

The term classical generally is used to describe the doctrines formulated by the men who founded English political economy and by their immediate followers, the foremost writers being Adam Smith, Thomas Malthus, and David Ricardo.⁵ Many of the concepts now attributed to this school of thought were later added and should not be considered as classical theories. Even though this makes it historically inaccurate to talk about the macroeconomic theories of the classical economists, it is still analytically useful to do so.⁶ Thus, concepts in this section will be tied to this school of thought.

The methodology of classical economists, particularly as exemplified by David Ricardo, was one of isolating abstraction.⁷ Even though he was well acquainted with the facts of business and economic life, Ricardo was a deductive thinker.⁸ Had Ricardo been a "purely" deductive reasoner, there are two possible approaches he could have taken in obtaining the chief

⁵Arthur D. Gayer, Philip C. Newman, Milton H. Spencer, eds., Source Readings in Economic Thought (New York: W. W. Norton & Company, Inc., 1954), p. 117.

⁶Gardner Ackley, Macroeconomic Theory (New York: The Macmillan Company, 1961), p. 109.

⁷Gayer, Newman, and Spencer, eds., Source Readings in Economic Thought, p. 118.

⁸Jacob Oser, The Evolution of Economic Thought (New York: Harcourt, Brace and World, Inc., 1963), p. 63.

postulates from which he made his deductions. The first approach, as exemplified by Lionel Robbins, would have been to assume that there are certain propositions that involve in some way facts of experience that are simple and indisputable.⁹ These postulates would be so self-evident, that they would be on a higher level than historio - relative or empirically observed subsidiary postulates.¹⁰ Another approach which a "purely" deductive thinker could take would be that method used by Rene Descartes. Descartes believed that he could intellectually doubt everything which possibly could be doubted, and from the indubitable minimum which remained, the remainder of his propositions could be deduced.¹¹ Since Ricardo often times changed his postulates,¹² the purely deductive approaches of Robbins and Descartes do not adequately explain his method. Ricardo was somewhat more flexible than Descartes in that the minimum from which he deduced was not indubitable. Ricardo was influenced by existential factors which caused him to make changes in his value judgments with respect to what he could deduce from.

⁹Lionel Robbins, An Essay on the Nature and Significance of Economic Science (London: Macmillan and Co., Ltd., 1937), pp. 70-77.

¹⁰Ibid., pp. 77-79.

¹¹F. S. C. Northrup, The Logic of the Sciences and the Humanities (New York: The Macmillan Company, 1947), p. 9.

¹²Oser, The Evolution of Economic Thought, p. 63.

For the classical economists, "Say's Law" and the quantity theory of money represented relations which made precise the longstanding belief that money served only as a "medium of exchange" which obviated the direct exchanges of "real" goods for each other. For example, the Greeks, while seeing no reason why the "progeny" of a borrowed mare or cow should not be returned at least in part to the owner along with the "principal," boggled at the notion that a loan of current coins could "breed money," by way of interest.¹³ Money that was not spent was useless.¹⁴ Since any logically valid chain of reasoning starts explicitly or implicitly from a certain premise,¹⁵ it seems reasonable to assert that Say's Law and the quantity theory of money were generalizations from the notion that the real and the monetary sectors of an economy are unrelated. Say's Law, which was formulated for a barter economy, said that production occurs only for the purpose of creating purchasing power in order to facilitate the acquisition of other commodities. Producers, seeking to sell all that they produce, will accept any price change. A flexible price structure insured that there would be no surplus of goods or unemployment. Thus, the structure of prices was determined by "real" factors

¹³John L. Myres, The Political Ideas of the Greeks (New York: Greenwood Press, 1968), p. 329.

¹⁴The Republic of Plato, ed. by Ernest Rhys (10 books; New York: E. P. Dutton & Co., 1911), 1, 8.

¹⁵Koopmans, The State of Economic Science, p. 132.

in the economy. Determination of the price level was, on the other hand, a monetary phenomenon as exemplified by the quantity theory of money.

The quantity theory of money is generally believed to have been "discovered" by Jean Bodin in 1566, although John Briscoe (1694) was the first to write an equation of exchange in the unsatisfactory form: stock of money equals price times real income.¹⁶ Richard Cantillon was the first to state in so many words that an increase in the velocity of money is equivalent to an increase in its quantity.¹⁷ The classical quantity theory could be represented as $MV = PY$, where M represents the quantity of money, V its income velocity, P the average price level, and Y the level of real output, or "real income." The classical exposition of the quantity theory was based on the assumption that output (Y) would normally be at full employment levels, and hence fairly stable. Money had no other function or significance except that of serving as a "medium of exchange" which obviated "barter" or direct exchanges of different "real" goods for each other.¹⁸ Given that both Y and V were stable, the quantity theory showed that prices must

¹⁶Joseph A. Schumpeter, History of Economic Analysis (New York: Oxford University Press, 1954), p. 314.

¹⁷Ibid., p. 317.

¹⁸Overton H. Taylor, A History of Economic Thought (New York: McGraw-Hill Company, Inc., 1960), p. 127.

vary proportionately with the quantity of money. The classicals also noted the effects of demand factors on the price level. If the price level were high, the demand for cash would be greater than the supply for cash. People would therefore hold on to money rather than purchase goods and services which pushed the price level down to equilibrium. Conversely, if prices were relatively low, the demand for money would be less than the supply. People would spend more, and prices would be forced upward. Thus, the classicals believed that the price level was determined by the money supply - demand relationship.¹⁹

The methodology of the classicals can be shown in a framework presented by Henry Margenau in his explanation of what a theory is (see figure 1).²⁰ Margenau defines theory as a complex of circles together with the double lines which connect them with the P - domain.²¹ The P - domain or the field of protocol is said to contain acts and results of elements such as seeing, hearing, sadness, approval, disapproval, wishing, willing, and other such sensory events.²² The C - field, or the domain of constructs, contains rational elements or concepts,

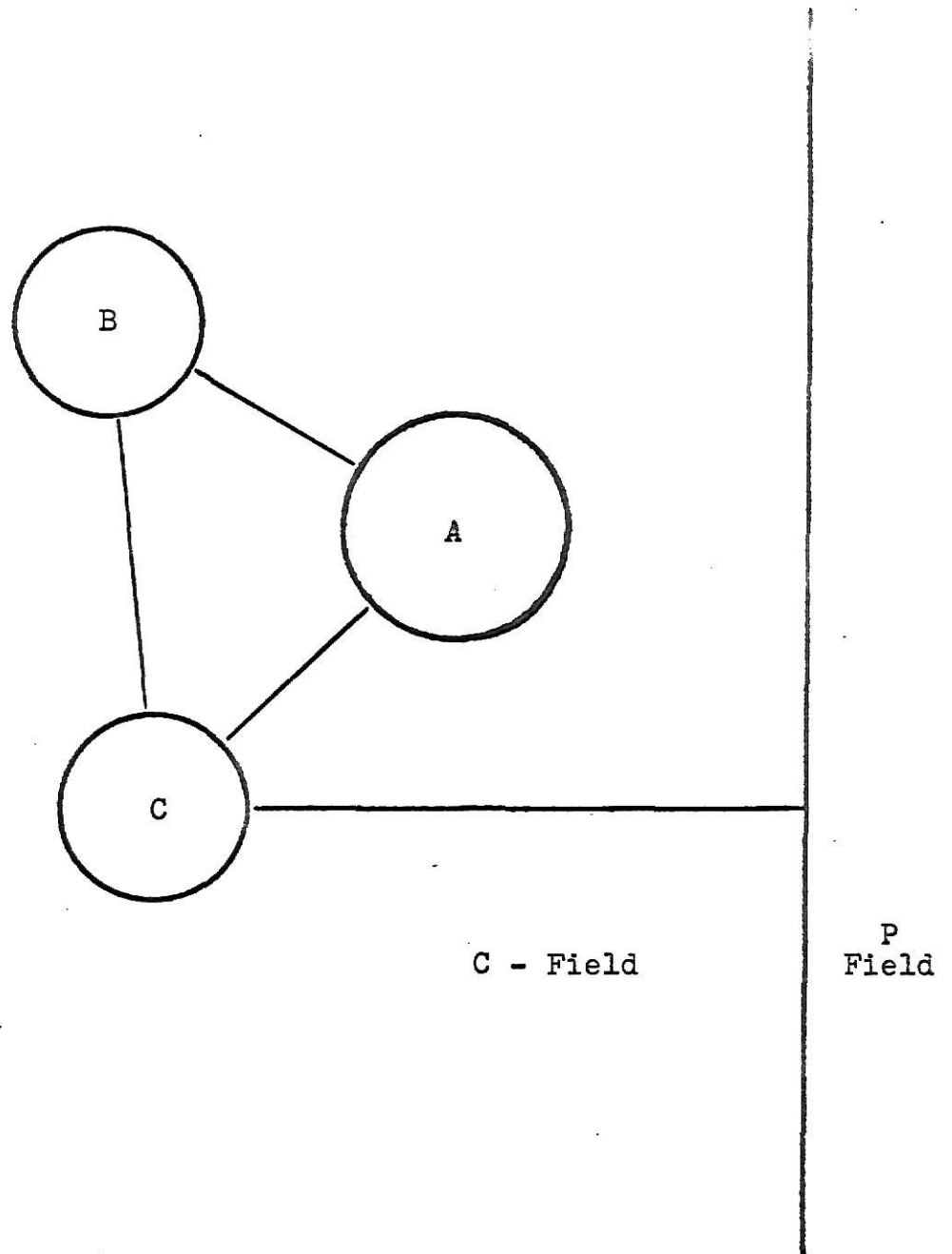
¹⁹William J. Baumol, Theory and Operations Analysis (Englewood Cliffs: Prentice-Hall, 1965), p. 345.

²⁰See Henry Margenau's essay What is a Theory (The Structure of Economic Science ed. by Sherman Roy Krupp [Englewood Cliffs: Prentice-Hall, Inc., 1966]).

²¹Ibid., p. 29.

²²Ibid., p. 27.

Figure 1.



and are shown as circles in Margenau's analysis.²³ The double lines connecting the P - field and C - field are rules for passing from a given P to its counterpart in C.²⁴ These rules are simply inductive - deductive procedures which organize events in some systematic manner. Classical analysis started in the C - field with the premise that the real sector and the monetary sector of an economy are unrelated. From this construct A, Say's Law and the quantity theory of money were deduced. As shown in figure 1, the quantity theory (construct B) and Say's Law (construct C) are logically connected. Say's Law guarantees that the level of real output (Y) is a stable factor in the quantity theory. Over short periods, changes in the quantity of money can affect Say's Law. Since commodity and factor prices change at differing speeds, changes in the stock of money will distort the distribution and allocation functions of the market mechanism. This may cause the level of employment to be lower than would otherwise be the case had the stock of money not been altered. In the long run, after commodity and factor prices have had time to change, changes in the stock of money will alter only the price level. Notice in figure 1 that only Say's Law is related to the P - field or the "real" world. This is because Say's Law deals with "real" factors, whereas money exchange merely facilitates and disguises

²³Ibid., p. 27.

²⁴Ibid., p. 29.

the direct exchange of different "real" goods for each other. Note that the boundary of the P - field is flat. This is due to the fact that no statistical work with respect to probability need be undertaken. Deduction is a chain argument. If the initial proposition is granted, one is forced to accept the others, simply because they are all implicit in the first.²⁵

²⁵Kenneth Parsons, "The Logical Foundations of Economic Research," Journal of Farm Economics, (Vol. 31, Nov. 1949), p. 668.

III. MILTON FRIEDMAN'S METHODOLOGY AND THE QUANTITY THEORY OF MONEY

Before considering Milton Friedman's methodology, consider the difference between a factual social theory and a normative social theory. Theories in social science which are answers to problems of fact involve construction of hypothetically designed, indirectly verified scientific theories, after the manner of those in the natural sciences.²⁶ Characteristic of the method appropriate for verifying such theories is that they designate any theory to be false if one fact is out of accord with any deduced consequence of the theory.²⁷ Normative social theories, on the other hand, are introduced to change the de facto situation at least in part, rather than conform to it.²⁸ Scientific methods may differ for problems of fact and for problems of value. That is, the two possible roles that economic theory can play, that of prediction and that of explanation, are not always compatible. If a theory explains a certain phenomenon, that is, it contains all possible variables and the correct relationships between these variables, it might be so operationally cumbersome that, quite likely, one

²⁶Northrup, The Logic of the Sciences and the Humanities, p. 20.

²⁷Ibid., p. 20.

²⁸Ibid., p. 21.

could never get a prediction from it. Take, for example, the homogeneity hypothesis. The homogeneity hypothesis says that if the independent variables of a function are increased by some proportion, the dependent variable will increase by a constant proportion. In the case of a demand for a certain product, if every possible independent variable were considered, one might find himself making an endless list of prices and preferences for all possible substitute and complementary products. Because of this, a theory must be to some extent, descriptively false in order to be operational.²⁹ With this in mind, consider Milton Friedman's methodology.

Friedman concerned himself with observed fluctuations in economic activity. Empirically, economic fluctuations have been associated with inflation and periods of less than full - employment.³⁰ Combining this with the 1946 Full Employment Act, which is a social value judgment regarding the desirability of stable prices and full employment, yields a problematic situation. Thus, one could say that fluctuation in economic activity is the problem which gave rise to Friedman's inquiry. To understand how Friedman might have arrived at solutions for changing the de facto situation, consider his methodology in a framework offered by F. S. C. Northrup as a portrayal of a

²⁹Milton Friedman, Essays in Positive Economics (Chicago: The University of Chicago Press, 1953), p. 32.

³⁰Full employment does not mean zero unemployment, but rather refers to some socially acceptable level of unemployment.

method used by Galilei in solving a problem left by Aristotelean physics. Galilei's procedure, which resulted in a new definition of force, was divided into the following explicit stages: (1) the projection by analysis of the hypothetical root of the problem; (2) the selection of relevant phenomena exhibiting factors involved in the difficulty; (3) the inductive observation of these relevant factors; (4) the development of the relevant hypotheses suggested by these relevant facts; (5) the deduction of logical consequences from each hypothesis thereby permitting them to be put to an empirical test; (6) the clarification of the initial problem in the light of the verified hypothesis; and (7) the generalization of solutions by means of a pursuit of the logical implications of the new concepts and theory with respect to applications and with respect to other concepts.³¹ Although the order of nature and the order of logical dependence are not the same as the order of our discoveries,³² Friedman's method will be analyzed in this distinct framework so that the passage between the domain of construction (the pure theories with their pure constructs) and the domain of recorded data can be more clearly understood.

³¹See F. S. C. Northrup's chapter on "The Analysis of the Problem" The Logic of the Sciences and the Humanities (New York: Harcourt, Brace and World, Inc., 1947).

³²Morris R. Cohen and Ernest Nagel, An Introduction to Logic and Scientific Method (New York: Harcourt, Brace and World, Inc., 1934), p. 278.

Friedman first projected the basic hypothetical root of the problem. The hypothesis which guided Friedman in his search for order among facts was that any interpretation of short-term movements in economic activity is likely to be seriously at fault if it neglects monetary changes and repercussions and if it leaves unexplained why people are willing to hold the particular nominal quantity of money in existence.³³ This hypothesis is based on empirical evidence that between 1870 and 1954, every time there was a significant monetary disturbance, it was accompanied by a severe economic fluctuation.³⁴ Because monetary disturbances have had an independent origin in many cases and because there has been nothing in the nature of economic fluctuation to make monetary disturbances inevitable, perhaps monetary disturbances should be considered as contributory causes rather than incidental effects of economic fluctuations.³⁵

Next, Friedman selected the stock of money³⁶ and income as being relevant phenomena exhibiting factors involved in the

³³Milton Friedman, "The Quantity Theory of Money - A Restatement," in Monetary Theory and Policy, ed. by Richard S. Thorn (New York: Random House, 1966), p. 69.

³⁴Milton Friedman, "The Demand for Money: Some Theoretical and Empirical Results," National Bureau of Economic Research, No. 65-70, No. 68 (1959), pp. 22-23.

³⁵Ibid., p. 23.

³⁶"Money" is defined as including currency held by the public, adjusted demand deposits, and time deposits in commercial banks.

difficulty. Subdividing the stock of money into the real stock and the nominal stock of money, Friedman made several qualifying distinctions.

. . . distinction is sharpest and least ambiguous in a hypothetical society in which money consists exclusively of a purely fiduciary currency issued by a single money creating authority at its discretion. The nominal number of units of money is then whatever amount this authority creates. Holders cannot alter this amount directly. But they can make the real amount of money anything they want to. If they want to hold a relatively small real quantity of money, they will individually seek to reduce their nominal cash balances by increasing expenditures. This will not alter the nominal stock of money to be held - if some individuals succeed in reducing their nominal cash balances, it will only be by transferring them to others. But it will raise the flow of expenditures and hence money income prices and thereby reduce the real quantity of money to the desired level. Conversely, if they want to hold a relatively large real quantity of money, they will individually seek to increase their nominal cash balances. They cannot, in the aggregate, succeed in doing so. However, in the attempt, they will lower the nominal flow of expenditures, and hence money income and³⁷ prices, and so raise the real quantity of money.

Although the situation is more complicated for monetary arrangements that actually prevailed during the time of the study, Friedman considered it useful to regard the nominal quantity of money as determined primarily by conditions of supply, and the real quantity of money as determined primarily by conditions of demand.³⁸

³⁷Friedman, "The Demand for Money," pp. 4-5.

³⁸Ibid., pp. 5-6.

An inductive observation of these relevant factors was made by Friedman and Anna Schwartz in an extensive study of secular and cyclical behavior of income velocity in the United States. In this study it was found that changes in real per capita income were highly correlated with changes in the real stock of money per capita. For twenty cycles measured from trough to trough and covering the period from 1870 to 1954, a 1 per cent increase in real income per capita was associated with a 1.8 per cent increase in per capita real cash balances.³⁹ Allowing for secular trends, a 1 per cent change in real income during a cycle was found to be accompanied by a change in the real stock of money in the same direction of about one-fifth of 1 per cent.⁴⁰

Friedman noted that given the level of real income, the ratio of income to the stock of money, or income velocity, is uniquely determined by the real stock of money.⁴¹ Income velocity is therefore determined by the holders of money, or, it is a reflection of their decisions about the real quantity of money they desire to hold.⁴² To explain the observed behavior income velocity, Friedman therefore projected three relevant hypotheses. These were the three commonly distinguished

³⁹Ibid., pp. 2-3.

⁴⁰Ibid., p. 3.

⁴¹Ibid., p. 5.

⁴²Ibid., p. 5.

"motives" for holding money - the "transactions" motive, the "speculative" motive and the "assets" or "precautionary" motive. The transactions demand for money is a demand based on the need for cash for current transactions of personal and business exchanges.⁴³ The "speculative" demand for money is a demand which results from the desire to secure profits by outguessing the market with respect to future prices.⁴⁴ The "precautionary" motive arises because of uncertainty with respect to future receipts and expenditures. There is a desire for security as to the future cash equivalent of a certain proportion of total resources.⁴⁵

Friedman next deduced the logical consequences from each hypothesis, enabling them to be put to an empirical test. First, he noted that if the "transactions" motive were the dominant motive for holding money, changes in cash balances would be tied to the volume of transactions. Empirically, changes in cash balances over short periods were found to be less volatile than changes in the volume of transactions.⁴⁶ Improvements in transportation, communication and financial organization have, according to Friedman, reduced any mechanical requirements for

⁴³John M. Keynes, The General Theory of Employment, Interest, and Money (New York: Harcourt, Brace and World, Inc., 1935), p. 170.

⁴⁴Ibid., p. 170.

⁴⁵Ibid., p. 170.

⁴⁶Friedman, "The Demand for Money," p. 5.

cash balances per unit of transactions. Thus, it is doubtful that secular increases in the ratio of transactions to income explain the growth in the ratio of money balances to income.⁴⁷ Friedman next noted that a logical consequence of the "speculative" motive for holding money would be wide cyclical variations in desired cash balances. Since changes in real income during a cycle were found to be accompanied by changes in the real stock of money in the same direction possessing an amplitude about one-fifth as great,⁴⁸ Friedman discounted the importance of speculation in determining the demand for cash balances. Having rejected the transactions and the speculative demands for money, the asset demand for money remained to be explained in terms of the empirical behavior of real income and the demand for money. In order to fit the asset hypothesis to the data, Friedman regarded the statistical magnitude called "real income" as corresponding to a different theoretical construct in the cyclical than in the secular analysis.⁴⁹ Friedman distinguished between "measured" income, the figure recorded by statisticians, and "permanent" income, a longer-term concept to which individuals are regarded as adjusting their demand for cash balances. Even though income that people expect to receive over future time periods rises and falls with

⁴⁷Ibid., p. 22.

⁴⁸Ibid., p. 3.

⁴⁹Ibid., p. 6.

expansions and contractions of the business cycle, it can be regarded as a more stable function than measured income. Thus, measured income presumably exceeds permanent income at cyclical peaks and falls short of permanent income at cyclical troughs.⁵⁰ If the demand for cash balances is based on permanent income, increases in measured income will exceed increases in the demand for cash balances. Conversely, declines in measured income will exceed decreases in the demand for cash balances. This conforms to the empirical evidence of velocity being positively related to cyclical changes in real income. To explain the secular behavior of income velocity, Friedman first noted that the income figure used was an average value over a cycle making it a closer approximation to permanent income than an annual value.⁵¹ Friedman then offered two possible explanations for the observed secular decrease in income velocity.

. . . . our results can be interpreted in either of two ways. One is that the relevant asset motive is equivalent to a consumption or income motive. As permanent income, which is to say, total wealth, rises, consumer units expand their expenditures on some items disproportionately

.
The other interpretation is more nearly an asset motive proper. It is that the holdings of cash are linked not to total wealth but primarily to non-human wealth and that, as permanent income rises, the total value of non-human wealth rises more rapidly than permanent income
.

⁵⁰Ibid., p. 7.

⁵¹Ibid., p. 7.

On either interpretation, however, our results suggest that motivations and variables linked with assets are the most fruitful category to explore - that the most fruitful approach is to regard money as one of a sequence of assets, on a par with bonds, equities, houses, consumer durable goods, and the like.⁵²

In the light of this information, Friedman could now clarify the problem which initiated the research. That is, to the ultimate wealth - owning units in the economy, money is one kind of asset. Therefore, the demand for money depends on three major sets of factors: (a) the total wealth to be held in various forms; (b) the price of and return on this form of wealth and alternative forms; and (c) the tastes and preferences of the wealth - owning units.⁵³ Friedman noted that since total wealth includes all sources of "income" or consumable services, "the" rate of interest expresses the relation between the stock which is wealth and the flow which is income.⁵⁴ Friedman expected the amount of cash balances held to be highly sensitive to "a" rate of interest for some range of rates of interest.⁵⁵ This would mean that real cash balances and the ratio of income to the real stock of money would be highly variable both cyclically and secularly, since small movements in interest rates would be accompanied by large movements in desired cash

⁵²Ibid., pp. 22-23.

⁵³Friedman, "The Quantity Theory of Money," p. 69.

⁵⁴Ibid., p. 69.

⁵⁵Friedman, "The Demand for Money," p. 23.

holdings.⁵⁶ Empirically, the secular behavior of velocity was found to be stable.⁵⁷ Thus, it is claimed that the demand for money has been highly stable - more stable than functions such as the consumption function that are offered as alternative key relations.⁵⁸

With the clarification of the initial problem, Friedman was ready to generalize by pursuing the logical implications of the verified hypothesis with respect to applications and with respect to other concepts. Consider first a generalization with respect to other concepts. One never deduces a consequence from a theory alone. Rather, deductions take place after postulated relationships are combined with an assumption of some change or an observation of some event.⁵⁹ Thus, given the asset hypothesis, Friedman sought a construct that would be consistent with the evidence of a stable demand for money. His choice among all alternative hypotheses was the quantity theory of money. To understand how Friedman justified such a conceptual simplification, one must consider an interpretation of the role of theory which Friedman seems to support.

⁵⁶Ibid., p. 23.

⁵⁷Milton Friedman and Anna Jacobson Schwartz, A Monetary History of the United States: 1867-1960 (Princeton: Princeton University Press, 1963), pp. 678-679.

⁵⁸Friedman, "The Quantity Theory of Money," p. 80.

⁵⁹Fritz Machlup, "Professor Samuelson on Theory and Realism," American Economic Review, (Vol. 54, September 1964), p. 733.

When constructing a theory, "scientific judgments" must be made pertaining to the variables that will be considered. These judgments are based on two factors. The first factor is the subject matter.⁶⁰ Since an investigation is usually initiated because an event contradicts an existing explanation or prediction of a phenomenon in question, and since the subject matter is defined by this contradiction,⁶¹ there will be a cultural bias associated with the subject matter. The second factor considered in making "scientific judgments" is information pertaining to the subject matter that has been gathered in the past, or background information.⁶² The gathering of information is a human learning process which arises in certain subcultures in human society.⁶³ Since a subculture is a group of people defined by acceptance of certain common values or an ethic, background information cannot be divorced from cultural considerations.⁶⁴ Thus, variables chosen in the construction of a theory are based on culturally biased data, making the theory culturally biased. This makes economic relationships "true" only for a certain cultural framework. Since

⁶⁰Parsons, "The Logical Foundations of Economic Research," p. 661.

⁶¹Cohen and Nagel, An Introduction to Logic, p. 199.

⁶²Parsons, "The Logical Foundations of Economic Research," p. 661.

⁶³Kenneth E. Boulding, "Economics as a Moral Science," American Economic Review, (Vol. 59, March 1969), p. 2.

⁶⁴Ibid., p. 2.

socio - cultural changes, change all the data, concepts, and problems of economic life,⁶⁵ and since there is nothing indicating stability in this milieu, perhaps one should be concerned with solving economic problems first, and with explaining economic phenomena second. Milton Friedman contends that a theory should be, above all, predictively accurate.⁶⁶ A theory should be rejected if its predictions are contradicted by empirical observations. Conversely, if its predictions are consistent with observations of the class of phenomena for which it is intended to explain, then a theory should be accepted. In cases where a more realistic theory yields better predictions, but only at a greater cost, the gains from greater accuracy must be balanced against the cost of achieving it.⁶⁷ Based on these criteria, Friedman chose the quantity theory of money as the most appropriate construct in his analysis.

Having arrived at the quantity theory of money, Friedman could then generalize solutions to problems by pursuing the logical implications of the theory with respect to its practical applications. First, Friedman noted that velocity changes have been about as important as changes in the stock of money in accounting, in an arithmetic sense, for the movements in

⁶⁵F. H. Knight, "Methodology in Economics," The Southern Economic Journal (Vol. XXVII, Jan., 1961), p. 185.

⁶⁶Friedman, Essays in Positive Economics, p. 17.

⁶⁷Ibid., p. 17.

money income.⁶⁸ Thus, in light of the finding that most of the velocity movement is somewhat "spurious," the view that changes in the stock of money cannot be the prime mover, or even of major independent importance in cyclical change needs re-examination.⁶⁹ Given a stable demand function for money, measured income should be highly sensitive in short periods to changes in the nominal stock of money. This has several implications with respect to monetary policy and reform. First, since the effects of monetary policy may be expected to operate rather more than would otherwise be supposed through the direct effects of changes in the stock of money on spending, and rather less through indirect effects on rates of interest, then in investment, and then on income, perhaps more attention should be paid to changing the stock of money than to altering interest rates.⁷⁰ Relatively small changes in the stock of money, properly timed and correct in magnitude, may be adequate to offset other changes making for instability.⁷¹ On the other hand, relatively small changes in the stock of money, random in timing and size, may equally be an important source of instability.⁷² This proposition when combined with the

⁶⁸Friedman, "The Demand for Money," pp. 23-24.

⁶⁹Ibid., p. 24.

⁷⁰Ibid., p. 25.

⁷¹Ibid., p. 25.

⁷²Ibid., p. 25.

observation of inadequacies with respect to forecasting suggests that it would be quite difficult, if not impossible, to select the proper time and the appropriate magnitude for a change in the stock of money. Thus, perhaps an instrument which will prevent monetary arrangements themselves from becoming a primary source of instability should be constructed.⁷³ This suggests two changes which should be made in current monetary instruments. First, since changing the discount rate, which is the primary control of rediscounting, causes speculation which introduces unnecessary instability into the economy, and since the discount rate must be continually changed to maintain a status quo in economic activity,⁷⁴ perhaps rediscounting by the Federal Reserve System should be eliminated.⁷⁵ Second, since the variable fractional reserve system: (a) involves extensive governmental intervention into lending and investing activities, which causes the money supply to behave more irregularly than it needs to, and (b) causes a reaction by banks which is highly speculative,⁷⁶ perhaps the reserve requirements should be made uniformly stable for all categories of deposits.⁷⁷

⁷³Milton Friedman, A Program for Monetary Stability (New York: Fordham University Press, 1959), p. 23.

⁷⁴Ibid., pp. 39-40.

⁷⁵Ibid., p. 44.

⁷⁶Ibid., p. 66.

⁷⁷Ibid., pp. 68-69.

Along with the suggested monetary reforms, there is a policy implication which arises from an observed inability to forecast. The inferred policy is that of increasing the supply of money at a known and constant rate which approximates, proportionately, increases in productivity. Increasing the money stock at a known and constant rate decreases uncertainty with respect to receipts and expenditures, meaning increased economic stability because of more long range planning. Increases in the stock of money proportionately equal to increases in output, decreases possible inflationary and dampening effects of monetary policy on economic activity. Money increases that are proportionately less than output increases tend to dampen economic activity. John Stuart Mill, who may have been the first to recognize this, noted that there would be a general inclination to sell with as little delay as possible, accompanied with a general inclination to defer all purchases as long as possible in the presence of an excess demand for money.⁷⁸ Money increases that are greater than increases in productivity could lead to inflation because, in the presence of an excess supply of money, there will be an increase in expenditures which will increase prices and measured income, therefore decreasing the real stock of money to the desired level. Thus, increasing the money supply at a known and constant rate which approximates increases in productivity

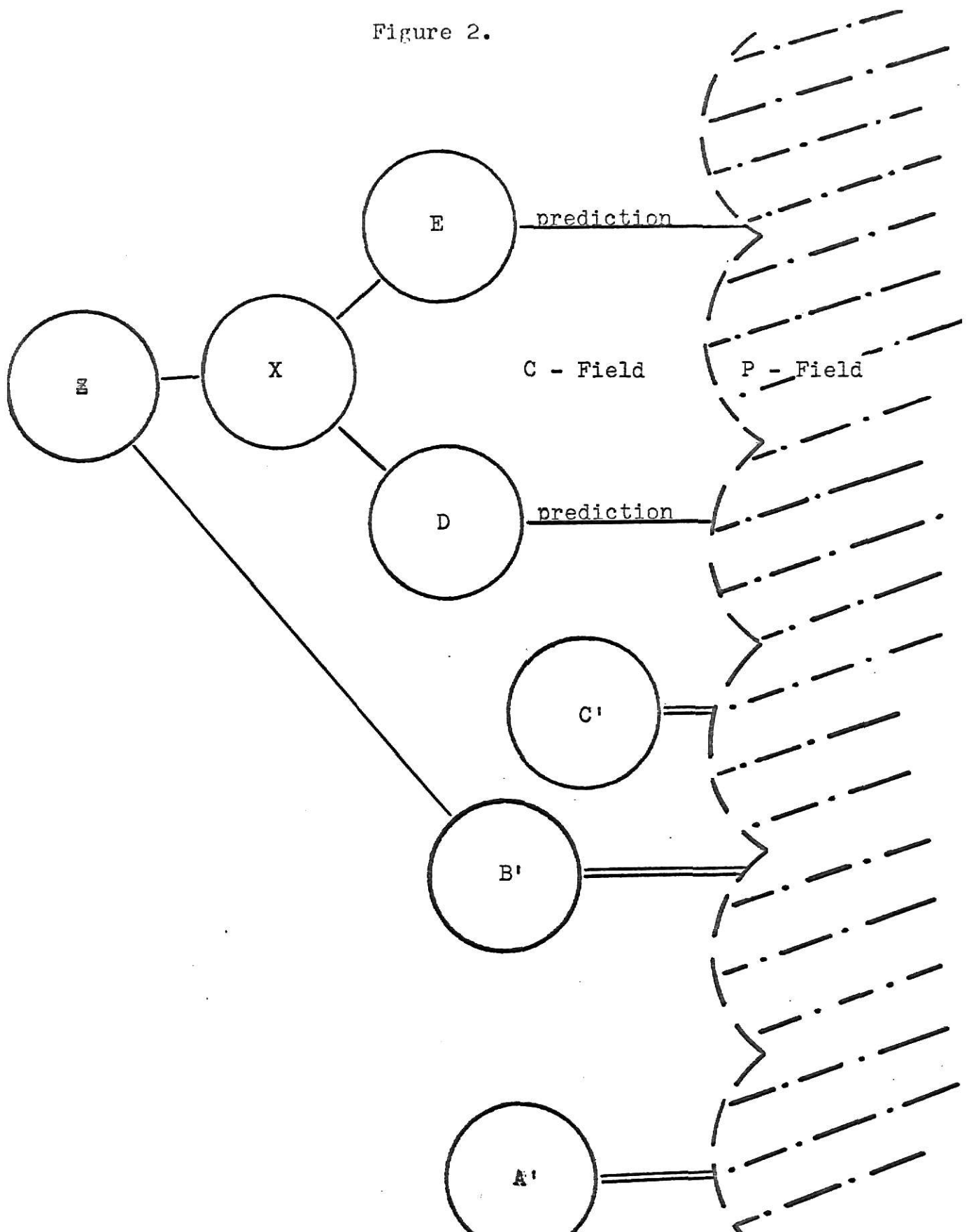
⁷⁸Mark Blaug, Economic Theory in Retrospect (Homewood: Richard D. Irwin, Inc., 1968), p. 153.

promotes economic stability because it: (a) decreases uncertainty, and (b) decreases possible inflationary and dampening effects of monetary policy on economic activity.

Consider Milton Friedman's method in the same Margenau framework presented earlier for the classical methodology. Steps one through four were accomplished by studying the subject matter and background information surrounding the subject matter. Steps one, two, and three took place in the P - field (see figure 2). An inductive - deductive procedure (step three), which are Margenau's rules of correspondence, took the analysis into the C - field. Since correlations form rudimentary scientific theories, slight humps appear in the P - boundary.⁷⁹ Step three culminated with the projection of three relevant hypotheses (step four) - the "speculative," the "asset," and the "transactions" demand for money (shown by constructs A', B', and C' respectively). Deducing the logical consequences from each hypothesis and testing these consequences empirically (step five), yielded construct B' as being the significant hypothesis and facilitated the clarification of the problem (step six). Friedman next generalized solutions by pursuing logical implications of the asset demand for money with respect to other concepts and with respect to applications. Noting that the demand for money has been secularly stable,

⁷⁹Margenau, What is a Theory, p. 35.

Figure 2.



Friedman arrived at the quantity theory of money as a theory of the demand for money (shown by construct Z in figure 2). From the quantity theory, Friedman reasoned that given a stable demand function for money, measured income would be sensitive in short periods to changes in the nominal stock of money (construct X). This proposition, when combined with the observation of an inability to forecast suggests that: (a) certain reforms should be made with respect to current monetary instruments, and (b) a particular monetary policy should be followed. The reforms which should be made are: (a) rediscounting by the Federal Reserve System should be eliminated; and (b) the reserve requirement should be made uniformly stable for all categories of deposits. Suggested reforms are shown by construct D in figure 2. The monetary policy which should be followed is that the supply of money be increased at a known and constant rate which approximates, proportionately, increases in productivity (shown by construct E). The prediction lines drawn from constructs D and E to the P - field, reflect an expectation that if the suggested monetary reform and policy is carried out, fluctuations in economic activity will be dampened.

IV. SUMMARY AND CONCLUSIONS

Classical economists started with the "common - sense" notion that the real and the monetary sectors of an economy are unrelated. Since classical observations were less systematic than Friedman's observations, because of a relative ignorance toward the subject matter and because of a lack of quantitative methods⁸⁰ which were available to Friedman, they relied more on the non-scientific methods of tenacity, authority, and intuition to verify the use of this premise. The method of tenacity means that could have believed this proposition simply because it had been believed in the past.⁸¹ Contradiction, in this case, can be avoided by closing one's mind to all conflicting evidence.⁸² If anyone questions the superior virtues of those offering such a proposition, the belief can be repeated as an act of loyalty.⁸³ With respect to the method of authority, an appeal is made to some highly respected source to substantiate any views held.⁸⁴

⁸⁰Econometrics, which can be defined as the application of statistical methods in the field of economic science in order to verify economic theorems, was not available until the early 1940's.

⁸¹Cohen and Nagel, An Introduction to Logic, p. 193.

⁸²Ibid., p. 193.

⁸³Ibid., p. 193.

⁸⁴Ibid., p. 193.

Although this method seems reasonable if it is used to make up for a lack of time or training, if the results are said to be infallible and final, then its use is questionable.⁸⁵ The method of intuition refers to a procedure where propositions are derived through an inner dialectic. Two of the more notable propositions derived by this method which have been shown to be false are: (a) the world is flat; and (b) the earth is the center of the universe.⁸⁶

There are several limitations associated with the methods mentioned above. First, the results of these methods are certain.⁸⁷ Given the major premise, one is forced to accept the resulting propositions simply because they are all implicit in the first. Second, they are not progressive, since new information which may arise cannot be incorporated.⁸⁸ Economists cannot build onto, and advance their predecessors' or their own work.⁸⁹ They will merely be "influenced" by such work, having to start again from the beginning of the same problems with a completely new system.⁹⁰ Consider, for example, David Ricardo.

⁸⁵Ibid., p. 194.

⁸⁶Ibid., p. 195.

⁸⁷Ibid., p. 195.

⁸⁸Ibid., p. 195.

⁸⁹Huchinson, The Significance of Economic Theory, p. 6.

⁹⁰Ibid., p. 7.

In the third edition of On the Principles of Economy and Taxation, he inserted a new chapter called "On Machinery."⁹¹

This was an interesting addition because it represented a complete change of mind on Ricardo's part, to the consternation of his followers and friends. By raising the possibility of technological unemployment, Ricardo further accentuated the conflict of interests between workers and capitalists.

Ricardo claimed that he had erred when he had previously supported the view that the introduction of machinery would help all three major classes. Their money incomes, he once thought, would remain the same while their real incomes would rise, because with machinery, goods could be produced more cheaply. Even labor would gain because the same labor would be demanded as before mechanization occurred, and therefore money wages would not fall

Having revised his thinking, Ricardo stated that the sudden introduction of machinery would benefit the landlord and the capitalist as he had believed in the past, but it frequently would be very injurious to labor. If more capital were invested in machinery, less would be available to pay wages.⁹²

A third limitation of non-scientific methods is that the selection of postulates is somewhat arbitrary, since it is based on subjective criterion such as intuition.

Milton Friedman's analysis started with the "common - sense" notion that money matters in an economy. From this premise he built downwards his foundations (steps one through six of his analysis), and upwards his structure of "laws" (step seven of his analysis). The foundation of Friedman's

⁹¹Oser, The Evolution of Economic Thought, p. 69.

⁹²Ibid., p. 69.

analysis was laid in an empirical domain. In steps one through four of his analysis, Friedman, in his search for order among facts, was guided by the premise that money matters. The relevant hypotheses suggested by the relevant facts were inferred from observations given this general rule. Thus, they were conclusions that were probably on evidence that was presumed to be relevant.⁹³ Since these hypotheses were inductive generalizations, making them statements of expectations that events in the past would also be found in future observations of the same class of events, the "transactions" motive, the "speculative" motive, and the "assets" motive for holding money are hypotheses that were subjected to empirical verification. Econometrics can be an important tool in this verification process. Theorems can be reduced into forms where the function of parameters of the model can be tested.⁹⁴

When Friedman pursued the logical implications of the asset demand for money (step seven of his analysis), he moved

⁹³Cohen and Nagel, An Introduction to Logic, p. 200.

⁹⁴For example, a logical consequence of the "transactions" motive for holding money is that changes in cash balances are tied to the volume of transactions. An appropriate model could be $C = ATv^b$, where C is cash balances and Tv is the volume of transactions. Increasing Tv by a , one would expect C to increase by the same proportion.

$$\begin{aligned}
 C &= ATv^b \\
 C' &= A(aTv)^b \\
 C' &= Aa^bTv^b \\
 C' &= a^bC \\
 C' &= aC \text{ if and only if } a^b = a \\
 \text{so } H_0: b &= 1 \\
 H_1: b &\neq 1
 \end{aligned}$$

from an empirical system to a theoretical system. Such a movement is desirable because: (a) the degree of exactness of empirical concepts depends upon the technical possibilities provided by the state of the arts; and (b) impurities and inaccuracies inherent in most sensory observations and recorded data destroy logical links between different concepts.⁹⁵

Friedman's movement from the empirical to the theoretical domain, was not an objective movement. First, Friedman made a value judgment when deciding that a theory should be predictively accurate rather than explanatory. Second, Friedman made a value judgment when deciding what apparatus would be suitable for answering particular questions. If there is one hypothesis consistent with the available evidence, there are always an infinite number that are.⁹⁶ Thus, the quantity theory of money was a choice among alternative hypotheses that was somewhat arbitrary.⁹⁷ However, it was not arbitrary in the same sense of the classical quantity theory. Friedman demonstrated the relationship between the entities of his system and the empirical world. Thus, even though the quantity theory is based on the hypothesis that the demand for money is highly stable:

⁹⁵Machlup, Operationalism and Pure Theory in Economics, Essay 4 in The Structure of Economic Science, ed. by S. R. Krupp (16 essays; Englewood Cliffs: Prentice-Hall, Inc., 1966), p. 57.

⁹⁶Friedman, Essays in Positive Economics, p. 9.

⁹⁷Friedman, "The Quantity Theory of Money," p. 68.

. . . hypothesis needs to be hedged the quantity theorist need not, and generally does not, mean that the real quantity of money, is to be regarded as numerically constant over time; he does not, for example, regard it as a contradiction to the stability of the demand for money that the velocity of circulation of money rises drastically during hyperinflations. For the stability he expects is in the functional relation between the quantity of money demanded and the variables that determine it, and the sharp rise in the velocity of circulation of money during hyperinflations is entirely consistent with a stable functional relation.⁹⁸

Friedman's methodology when compared to classical methodology, reflects observations which are more systematic. Classical conclusions, which were deduced from a set of hypothetical propositions containing only pure constructs, follow the major premise by logical necessity. Such conclusions may or may not be applicable to concrete situations in need of explanatory or predictive judgments.⁹⁹ Milton Friedman's conclusions, on the other hand, were based on inductive generalizations about observed events. Thus, his conclusions possess some more or less definite probabilistic value. Although empirical evidence plays an important role in the construction of theory for Friedman, once a movement is made from the empirical to the theoretical domain, rejection of the theory will occur only if predictions are not consistent with

⁹⁸Ibid., p. 80.

⁹⁹Machlup, Operationatism and Pure Theory Theory in Economics, p. 58.

the class of phenomena for which the theory is meant to refer. That is, the theory can be rejected only if its predictions fail to provide solutions to the problem which initiated the inquiry.

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THE QUANTITY THEORY OF MONEY:
TWO CONTRASTING APPROACHES

by

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AN ABSTRACT OF A MASTER'S REPORT

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The methodology of classical economists, particularly as exemplified by David Ricardo, was one of isolating abstraction. Even though he was well acquainted with the facts of business and economics, Ricardo was a deductive thinker. For the classical economists, "Say's Law" and the quantity theory of money represented relations which made precise the belief that money served as a "medium of exchange" which obviated the direct exchanges of "real" goods for each other.

Milton Friedman's quantity theory of money was derived in a manner which is very similar to a method used by Galilei in solving a problem left by Aristotelean physics. In his analysis, Friedman: (1) projected by analysis the hypothetical root of the problem; (2) selected the relevant phenomena exhibiting factors involved in the difficulty; (3) made an inductive observation of these relevant factors; (4) developed the relevant hypotheses suggested by these relevant facts; (5) deduced the logical consequences from each hypothesis thereby permitting them to be put to an empirical test; (6) clarified the initial problem in the light of the verified hypothesis; and (7) generalized solutions by means of a pursuit of the logical implications of the new concepts and theory.

Classical analysis started with the "common - sense" notion that the real and the monetary sectors of an economy are unrelated. The classicals could have used the methods of tenacity, authority, or intuition to justify the use of this

premise. Using such methods results in conclusions that are certain, non-progressive and arbitrary. Conclusions such as these may or may not be applicable to concrete situations in need of explanatory or predictive judgements.

Milton Friedman's analysis started with the "common - sense" notion that money matters in economic activity. From this premise he built downwards his foundations and upwards his structure of laws. Friedman's methodology when compared to classical methodology, reflects observations which are more systematic. Although empirical evidence plays an important role in the construction of theory for Friedman, once a movement is made from the empirical to the theoretical domain, rejection of the theory will occur only if predictions are not consistent with the class of phenomena for which the theory is meant to refer.