

INFORMEDNESS OF ECONOMIC AGENTS AND THE QUANTITY THEORY OF MONEY

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ABSTRACT

Historically, informedness of economic agents via price stability has been a rationale for the money supply rule derived from the Quantity Theory of Money. The monetarists maintain that changes in the price level are attributable to the level of the money supply; hence, a money supply rule is adopted as the means to curb inflation. Given the adopted monetary policy, agents are informed of expected price level changes. From a *relativist* perspective, in the absence of monetary dislocation or revaluation, this paper maintains that changes in the general price level are attributable to the net effect of the realignment of relative prices. If as posited that changes in the general level of prices are not a function of changes in the supply of money but of changes in the composition of aggregate demand and supply, then the money supply rule for monetary policy would be ineffective at best and disruptive at worst. Apart from adverse financial impacts on business, the ‘quantity theory’ inflation-designed short term interest rate policy has induced several significant negative effects on the capital markets in 1987 and in 2006. Apparently, economic agents are better informed under the *relativist* approach than under the *monetarist* approach.

INTRODUCTION

Greenspan [2000] maintains that “inflation is at root a monetary phenomenon” and by definition it is a fall in the value of money relative to the value of goods and services. Since our financial system is continuously being revolutionize by technology, identifying particular claims as money, near money, or a store of future value has become exceedingly difficult. It is correct to conclude that the fundamental source of inflation is an excess of money relative to output; however, what constitutes money has eluded our analysis. To cope with this uncertainty, we ensure that growth in the money supply, as reasonably defined, does not exceed the limits of perceived prudence. Given the difficulty that exists in precisely defining those limits, significant scope for discretion in setting policy remains within any such

prescribed limits. As per Meyer [1998], the principal determinant of inflation in the long run is monetary policy. Consequently, this proposition immediately makes price stability the direct, unequivocal, and singular long-term objective of monetary policy. Like most central banks, monetary policy is implemented in the U.S. through the control of (short term) interest rates. It is sometimes said that forward-looking policy is to be pre-emptive. Accordingly, in response to rising utilization rates, a movement in interest rates would be a pre-emptive move against inflation. In the drive to head off inflation, from July 2004 up to March 2006, the discount rate has risen from 2% to 4% [Federal Reserve Bank of Minneapolis].

SOME EVIDENCE ON REACTIONS TO MONETARY POLICY

Since the Federal Reserve Board (FRB) had pushed a key interest rate up for a 16th consecutive time in May 2006, many economists had been hoping that would take a pause at its upcoming meeting of June 28-29. Instead, however, many analysts believe that the FRB might decide to keep pushing rates higher at the August meeting as well. This sentiment is due to the fact that Bernanke, who having succeeded FRB legend Greenspan on February 1, 2006, wishes to prove his inflation-fighting determination in a similar fashion as did his forerunner. At his first meeting upon taking office in August 1987, Greenspan had pushed through a half-point increase in rates, which was blamed for contributing to the unease that triggered the Black Monday stock market crash in October of 1987.

Inadvertently, in testimony before the Joint Economic Committee on April 27, Bernanke got off to a rocky start by raising the possibility that there might be a pause in rates hikes to assess the impact of earlier increases on the economy. On the belief that Bernanke was signaling not simply a pause but a halt to the two-year rate campaign, the capital markets rallied strongly. However, at a Washington dinner, the new FRB chairman complained to a reporter that his statement (May 1, 2006) had been misinterpreted. Two days later, when those comments were reported, the markets plunged. Analysts predict that interest rates will

keep rising as long as Bernanke continues to be worried that the central bank is lagging behind on fighting inflation [Crutsinger May 6, 2006].

On June 5, 2006, investors worried that Federal Reserve Chairman Bernanke's tough talk on inflation meant that interest rates would continue to be raised and U.S. stocks fell driving the Dow industrial average to its lowest close in three months. Also, that sell-off pushed the Nasdaq index down by more than 2 percent - its biggest one-day percentage decline since January 20 - and put it back into the "loss" column for the year. The Dow Jones industrial average lost 199.15 points (1.77%) to end at 11,048.72. The Standard & Poor's 500 Index fell by 22.93 points (1.78%) and finished at 1,265.29. The Nasdaq Composite Index dropped 49.79 points (2.24%) to close at 2,169.62. Partly due to concerns about rising crude oil prices, the market had been sharply lower before Bernanke's comments to a group of bankers in Washington. After having said that Fed policy makers will be vigilant to make sure inflation stays under control even as the economy starts to grow at a slower pace, the losses on stocks sharply extended [Valetkevitch June 5, 2006].

To make matters worse, on Tuesday June 6, 2006 stocks dropped for the second straight session. For the first time since March, the Dow Jones industrial average fell below 11,000. Before narrowing its loss later in the session, in midday trading the Dow lost more than 110 points. Bernanke's communication stumbles lead investors to fear that short term interest rates will be raised by an over-vigilant FRB, which could push the economy to the point of a recession [Simon 2006].

GROWTH IN THE MONEY SUPPLY AND THE QUANTITY THEORY OF MONEY

Given the foregoing statements, it is important to note that in the 1980s the monetarist model crashed--*reductions in the general level of prices became associated with more rapid growth of the money supply*. From 1975 to 1982, growth in the money supply (M1) averaged slightly over 7 percent per year, while the GNP implicit price deflator rose on average at a rate of 9 percent [Boschen 1990:84]. However, since 1982 the average annual growth of M1

has accelerated to 9.5 percent, while growth in the general price level has averaged just 3.5 percent [Walsh 1990:8-9,186] and the velocity of money has declined [Fisher 1989:156-158]. Given the problem with M1, it was hoped that M2 could have filled the gap; however, it suffers the same fate since its elasticity is much too large to permit it to function as an adequate target except in well defined circumstances [Kohn 1990:3-4]. In view of those problems, the Federal Reserve abandoned the dominant role for monetary aggregates in monetary policy--a zero weight is assigned to monetary aggregates [Blinder 1998:29]. Measures of *performance of the domestic economy* is the focus of attention [Melton and Roley 1990:78]. Furthermore, in the wake of the booming activities in the financial markets, there is much concern as to what weight should be placed on asset prices [Greenspan 1999].

While nominal money prices are signals informing agents of changes in the relative exchanges among commodities, the money supply rule (via the Quantity Theory or any variation) *which should enable agents to be informed about expected changes in the price level confounds the signalling process* that is inherent or at least is the function of the price system. It is most unfortunate that in the inflation debate, *paper money is considered the villain for a problem which is inherent in the price system*. While efficiency can be achieved through the price system, it is indifferent to the individual's position; consequently, it does not prescribe a just distribution of income in any form or fashion [Arrow 1974:20-22].

The Quantity Theory of Money was developed in times of commodity money.¹ The continued adherence to it when nominal (fiat) money is in use imposes a heavy and unfair burden on fiat money. Specifically, the policy implications for society are quite problematic. The alternative (relativist) view, offered in this paper, maintains that *it is the net effect of changes in relative prices which causes changes in the general price level*. That is, *changes in the general price level occur as a result of a net realignment of prices of individual commodities--some go up, others go down, while others stay the same*. Therefore, except for those instances of monetary dislocation--collapse of the monetary system--or a direct devaluation of the money by the issuing authority, inflation is not a monetary phenomenon.

The relativist view differs significantly from that of the monetarist. If inflation is not a monetary phenomenon, then monetary policy consistent with the Quantity Theory can aggravate an inflationary situation. The policy issue is not trivial. Stability in the rate of change in the general level of prices can be and have been accompanied by price instability; that is while wide changes in individual commodity prices have been observed over time, the rates of change in the general level of prices have been relatively stable [Benjamin Friedman 1990:71]. The implication for the monetary authority would be the elimination of the reactionary approach to monetary policy--the avoidance of an interest rate policy which wreaks havoc in the short run (interferes with price signalling) and complicates matters in the long run (crowds out fiscal policy).

The Quantity Theory: An Overview

To Wicksell [1935;1936], it is the difference between the natural rate of interest and the market rate of interest which causes the money supply to be out of alignment with the demand for money, and the impact of such misalignment is on commodities prices. A special proportionality relation is held to exist between the quantity of money and commodity prices [Wicksell 1935:136,141]. Thus, it is possible to control the price-level by controlling the money supply. Hence the money growth rule emerges and the interest rate would be the means to alter the money supply .

Tooke [1844] using statistical data on interest rates and prices with an appropriate theory of economic behavior negated the validity of the Quantity Theory. However, Wicksell [1935:185,207-208] concluded that if one were to reverse Tooke's interpretation of his findings, then one would arrive at the correct interpretation which supports the Quantity Theory. Yet a multitude of past and current research continues to offer support for Tooke on the endogeneity of money. "[T]here appears to be no shortage of episodes that cast doubt on the existence of any simple correlations between money growth rates and inflation. [T]here is substantial evidence that the relationship between the rate of growth of the money supply

and the rate of inflation depends crucially on the way in which money is introduced into (removed from) an economy” [Smith 1985a:532].

This paper accepts the usefulness of the equation of exchange ($MV = PQ$). Given assumptions about M or V , investigations of the behavior of velocity and money supply can be undertaken [See Spindt 1985]. However, being a tautology, the equation of exchange can not provide any answers. Also, under some very restrictive assumptions about utility and production functions, the use of index numbers is accepted as valid and appropriate for some types of physical productivity measures.

An Alternative to the Quantity Theory

The thrust of this paper is on the endogeneity of money and the informedness of economic agents, who are relativists and not absolutists/monetarists in making decisions. Relativists focus on changes in relative prices, use nominal money prices as signals, and anticipate changes in those prices. They are guided by nominal interest rates--which reflect anticipated changes in the general level of prices, the rate of return on investment on nominal money, and the effect of changes in nominal money prices on their nominal money incomes.

Proposition: In the absence of monetary dislocation or devaluation by the issuing authority, price level changes occur according to the relativist view. The information identified with the relativist approach suggests that economic agents are well informed, while the information generated under the absolutist approach (a general price level index) can be misleading to the individual decision maker.

MONEY AND PRICE LEVEL CHANGES

According to Wicksell [1935:129], "the value of money and the price level are synonymous, or more correctly, correlative ideas." Therefore, by definition any change in the price level would constitute a change in the value of money. Similarly, Friedman [1980:254-255] maintains that inflation (wherever its presence happens to be observed) is a monetary phenomenon.² However, a monetary cause of inflation would be true in an

economy in which paper money was replaced by precious metal as the medium of exchange; but even then, it has been shown that only in limited and in infrequent situations has this condition been fulfilled [Brenner 1971:74;Gould 1965:94-96,108,109]. Evidence for twenty countries for a period of about eight years contradicts Friedman's hypothesis [Fellner, et al., 1964:13]. Meltzer [1977:201-202] concluded that: "if maintained inflation is defined as the average rate of price change, the results deny that inflation has been entirely a response to growth in money." In addition, Laidler [1989:1157] states:

The data on the timing of cyclical turning points in various U.S. time series, which Friedman first drew to our attention in 1958 (reprinted 1969), are extremely suggestive, but the simple fact remains that a further 30 years of monetarists analysis has not been able to demonstrate the empirical existence of a structurally stable transmission mechanism between money and inflation to the satisfaction of its own practitioners, let alone its critics. ... Monetarists in search of support for the case that money is more a causing than a caused variable often turn to the analysis of extreme experiences.

While an increase in the money supply can accentuate a rise in the price level, a change in the '*general price level*' is not a monetary phenomenon [Ball 1964:69,77; Goodhart 1975:199,216-217; Hansen 1951; Harrod 1973:82; Hawtrey 1950:Chap.1; Holtfrerich 1986]. Inflation is attributable to non-monetary factors [Dow and Saville 1988:240]. It is to be found in a barter economy [Fuller 1980:6-7], in which case the entire set of exchange ratios are realigned, thus, redistributing exchange (purchasing) power among the members of that society.

As stated by Shenfield [1976,70], the general price level is a holistic fiction. Relative prices are what mostly matters and the general price level does not masks the course of relative prices. Invariably individuals may be aware of both the general price level and the relative prices. Since there is no such thing as a general value of money, the general price level is a fiction. Money, as a human tool, has never been used or could ever be used to buy the general price level index. While national income is a reality arrived at by aggregating the

incomes of a group of individuals, the general price level index derived from aggregating the transactions wherein money has been exchanged for goods [and services] cannot be a reality. Also, according to Tobin [1978:246]: "It is not in fact possible to invest in the GNP Deflator or to hoard the basket of goods, services, and taxes valued by the Consumer Price Index."

NATURE AND ROLE OF INDEX NUMBERS

Basically, the price level index is a *derived measure* that maps empirical observations of real numbers and satisfies economically relevant conditions. The information, to be derived from this mathematical creation, determines the form of those conditions. The index, derived from *financial flows*, provides answers to specific questions of a *physical flow* nature.

A money economic system is characterized by financial flows, which are induced by the prices of the physical quantities of goods and services consumed in each period. The interrelationship of all prices in the money economic system gives rise to a price system. In this setting, economic growth is defined as the increase in the physical output in the current period over that of the prior period. Out of practical necessity, the physical output of all heterogeneous goods and services produced by the economic system is measured in money terms--nominal money expenditures and accounting transfers. Conversion of these money valued output by a price level index permits the measurement of changes in output over time. In this fashion, *physical output, the basis of economic growth* of the system, is measured.

Output indices are developed exclusively using money and implied money terms [Dahlberg 1956,7; Greenberg 1961,149]. Clearly, indices are defined and applied because it is practically impossible to assess or compare complex or extensive systems of data [Eichhorn 1978,38-39]. Accordingly, price level indices enable the construction of physical production indices in the absence of statistics on physical quantities. With these mathematical creations, one can assess physical output efficiency and physical input efficiency of the entire system.

For the purpose of physical output comparison with prior periods, the price level index would be used to deflate the current period's output value [Rajan and Zingales 1998:569], then a productivity index would be established by dividing the output value of the current period by the output value of the base period. However, it must be recognized that physical productivity measures do not reveal consumer preferences, and it is the rate of return on nominal money which provides a clear indication of the efficiency of the financial flow system [Salvay 1993:165-169]. To the financier, who has invested \$x, it is irrelevant what physical quantities (one million tables or ten thousand lamps) were involved in the generation of the desired rate of return. Output decisions in a money economy are conditioned by the rate of return on nominal money invested and not by physical factor productivity. The rate of return over cost (and its variant - the marginal rate of return over cost) is a factor which influences the rate of interest [Fisher 1930:176]. From the standpoint of financial efficiency, only the attainment of the desired risk adjusted rate of return is relevant. Indubitably, the rate of return on nominal money invested (an index in its own right) is a valid index, which serves a significant function.

Due cognizance must be given to the fact that the price level index (a mental construct) maps one set of empirical observations into the set of real numbers satisfying a system of economically relevant conditions. This index is a derived measure for the transformation of observed prices into fictitious 'constant price values' [Menges 1978:52]. Specifically, the price level index is a mapping from a financial flow system into a physical flow system. This mapping is undertaken to compare the physical outputs of two different time periods. Productivity indices are developed to answer questions pertaining to physical output, labor productivity, plant utilization, technological efficiency, and an estimation of the level of technology employed on an inter-period and inter-country basis.

While financial flows reflect consumers' behavior, consumer taste is not some physical constant which is invariant over time. Consumer behavior is influenced by psychological factors and not physical quantities. Consequently, in a money economic system, the

investment decision is indifferent to the physical quantities, but highly sensitive to the rate of return on nominal money invested. While the two systems (the physical and the financial) are linked, they are not interchangeable. That is, a mapping from the financial flow system to the physical flow system does not permit the same interpretation. *The numerical relational system enables a mapping of observations from the empirical world, but it is not linked to the empirical world.* Hence, it is necessary to understand the difference between mathematical creations (mental constructs) and the specific social phenomena for which the mental constructs assist in providing certain clearly defined insights

INFLATION: NECESSARY CONDITIONS VS SIMPLIFYING ASSUMPTIONS

Clower [1971/1984:118], with a very sanguine assessment of Friedman's work, maintains that: "Since the monetarist school has not provided an explicit formal account of the dynamics of monetary adjustment, . . . the bulk of monetarist literature . . . [is] so much sound and fury, signifying little more than the personal charm, dialectical skill and encyclopedic factual knowledge of its chief apostle, Milton Friedman. The monetarist literature is important--and highly so--for the questions it forces us to ask about observed patterns of behaviour; but it is worth almost nothing as far as the answers to these questions, or guidance in seeking answers, is concerned."

Substantial empirical evidence casts doubts on the relationship between the growth rate of the money supply and rate of change of the price level [Smith 1985a:532-533,535,542-543;1985b:1193-1196]. Such evidence may account for the fact that Friedman and Schwartz [1982:5,218,238] expressly leave the door open, that the direction of causation can be from nominal income (Y) to nominal money (M). "The simple correlation between money growth and inflation . . . calculated in the form often recommended by Milton Friedman, although statistically significant, is now significantly negative. One can only wonder what, other than a tautology, is left of the notion that inflation is 'always and everywhere a monetary phenomenon'" [Benjamin Friedman 1990:70-71].

Necessary Conditions for Monetarist View

According to the monetarist view, the general price level changes due to the fact that: (1) the money supply increases while the quantity of goods and services remains unaltered, or (2) the money supply increases at a higher rate than that of the quantity of goods and services. Situation #1 simply reflects the monetarists' fundamental assumptions of the neutrality of money and general economic equilibrium. The implication of the assumptions is that any change in the money supply is offset by a change in the general level of prices to restore the general equilibrium between markets.³ The neutrality assumption precludes the accumulation of money in its own right. However, money is not neutral⁴ and it is not a commodity with the usual commodity effect.⁵ Given thrift-minded individuals, a change in the money supply will not, of itself, produce a change in the price level. Of empirical significance is evidence on savings in light of an increase in the money supply. During the late 1980s, the Chinese government (central bank) issued credits of about 6% of GNP to the banking system. Price increases in China could not be attributed to the increase in money supply, simply because Chinese households substantially increased their savings in the form of money balances. In the 1990s this trend continues with savings increasing from 30% to 40% of GNP [Sachs and Woo 1994:128-129]. In situation #2, a change in the velocity of money is more likely to occur than a change in the price level [See: Walsh 1990:8-9,186; Fisher 1989:156-158]. Except for a few rare instances, the aforementioned conditions (1) and (2) do not materialize.

For inflation to be a monetary phenomenon, the prices of all goods and services must rise simultaneously in some lagged fashion with each increase in the level of the money supply. The available empirical evidence does not support this position in a strict cause and effect relationship. For all prices to rise simultaneously due to an increase in the supply of money, it would be necessary for aggregate demand at prevailing prices to increase with no increase in aggregate real supply owing to the economy operating at its practical full capacity. Nevertheless, there is no denying that *an extensive sustained increase in consumer*

credit over time will result in a sustained increase in the general price level. Still this latter condition does not negate the fact that technological advances and economies of scale not only have prevented some prices (e.g., calculators, microwave ovens, etc.) from moving upwards but instead have forced them downwards.

Given past experience, in all major inflationary situations, the loss in value of money cannot be attributed to any one of the two situations described above [Bresciani-Turroni 1937:Chap.IV]. The only instance in which the monetarist view obtains is when there is a loss of confidence which brings about a repudiation of paper money. The loss of confidence is a "crisis of doubt" [Bresciani-Turroni 1937:172] which leads to an increase in the velocity of circulation of paper money. When full repudiation is reached, the economic system is reduced to a barter system. It was the use of foreign currency which prevented Germany in 1923 from being completely transformed into a barter economy. In recent times, the "crisis of doubt" resulting in the dislocation of the domestic currency has been experienced in Russia, where the preferred means of saving is the U.S. dollar [Vasiliev 1994:134].

ABSOLUTIST AND RELATIVIST VIEWS OF PRICE LEVEL CHANGES

The fundamental difference between the absolutists/monetarists and the relativists is the manner in which they perceive the change in the general level of prices occurs.

The Absolutist/Monetarist View

The monetarists hold that: M is exogenous, and only changes in M produce changes in the price level. This position is grounded tautologically in the quantity theory which holds that "the nominal money supply at time t is the nominal value of all assets". This view of money, as the value counterpart of assets, permits the calculation of constant real balances; it establishes "perfect proportionality between money and the price level" [Sargent and Wallace 1982:1219].

Monetarists argue for causation from $M \rightarrow Y$. Yet, as per Samuelson [1965:103]: "[h]istorically, M has lagged behind Y at turning points [in the business cycle]. Crude cause

and effect would then lead to the inference that Y is the cause and M effect. But those who want to reverse the direction of causation can always take foolish comfort in the fact that the rate of growth of M, dM/dt , will for a quasi-sinusoidal fluctuation turn down one-quarter cycle before M itself--and thus the causal sequence $dM/dt \rightarrow Y$ may help save the appearances."

The Relativist View

From the perspective of the relativists, M extends the production process and the rate of return on nominal money invested influences output. The relativists maintain that M is endogenous. Empirical evidence suggests that when an attempt is made to treat money as exogenous by policy, financial innovations on the part of business firms takeover and restore the endogenous nature of money in the economy [Judd and Scadding 1982:1001-1005,1013]. Hendry and Ericsson [1991:32] further reinforces this point.

While Y exists in the absence of M [Arrow 1981:140], the higher the degree of monetization of an economy, the greater is the interdependence of Y and M. Thus, in a money economy, it would be startling if M was not positively correlated with Y. However, causation would run in the direction of Y to M rather than the reverse, because Y is exogenous while M reflects the extent to which goods are exchanged for money rather than goods for goods.

THEORETICAL FRAMEWORK

Money (M), which is "a vehicle for transferring purchasing power over time" [Davidson 1972:62], was introduced by society as a cost efficient means of transacting [Brunner and Meltzer 1989:250]. Nominal (paper) money has a demand and supply function. However, the cost for the use of money as an agent is not to be confused with the nominal value of money. Money is priced in terms of itself (i.e., \$1.00 = 100 cents). Its *use* is compensated for in terms of itself, and such a cost is expressed as a rate (viz: interest rate). The liquidity cost of money is zero; the same is true for the expected change in its nominal value and its carrying cost. In a money economy, nominal money is the medium of

exchange, units of *uncertain* purchasing power are held in the form of nominal money [Keynes 1930:55-56], and nominal money flow is the critical dimension.

It is argued that money in its domestic economy is an "unchanging standard against which all other . . . readily reproducible capital goods . . . and titles to capital goods and debt contracts can be measured" [Davidson 1972:62-64]. Given the basis of this *unchanging standard*, then change in the general level of prices would be the primary measure of change in factor cost for financial institutions. Thus, financial institutions adjust their lending rates to incorporate anticipated changes in the general level of prices.

It may be argued that paper money is a commodity; but, it is its use--credit--which is the commodity. In this case, the *price of credit is the interest rate*. Thus, if there is an increase in the supply of credit, then its price will fall and more goods and services will be provided. On the international scene, paper money is construed to be a commodity because it is traded. However, that view is at best only partially correct because it is the goods and services and the prevailing relative prices (price level) of the domestic economy that determines the rate of exchange of that economy's paper money vis-a-vis every other economy's money. In international trade, paper money is akin to representative money or bills of exchange.

The Dynamics of a Money Economy

A money economy is characterized by the monetization of the economy and the socio-economic adaptations. Monetization (the interconnection of all parts of the economic system through the flow of nominal paper money) enables the storing of services and permits an investment in the process of production, which gives rise to the concepts of: *money-capital*, *finance*, *earnings*, and *profit*. *Money-Capital*--money savings available for investment purposes--is the inflow of money into the capital market. *Finance*--raising of money-capital for production in the commodity market--is the outflow of money-capital from the capital markets. The consumption and production decisions of the participants in the commodity market cause the gross monetary inflows and outflows to expand and contract. In that

market, the services of factors (agents) used in production are secured and stored giving rise to factor claims--*Earnings* (the returns to original and durable agents). A portion of *Earnings* is saved and fed into the capital market. The unsaved portion flows into the commodity market

Nominal money permits the *storing of uncertain purchasing power in nominal terms*. In a surplus-oriented money economy, adaptation to this socio-economic stimulus (storing) results in the production process being motivated by monetary exchanges to accumulate money--the concept of profit/loss emerges. The firm (producer) is concerned with the accumulation of a stock of money [Boulding 1950:6,112; Georgescu-Roegen 1971:216].

Economic Behavior

The money economic system is driven by *Money-Capital, Earnings and Profit* interacting through the price mechanism. In this system, relative prices, expressed in nominal money terms, act as signals: information flow and feedback. Money prices reflect changing conditions; in so doing, money fulfills its signaling function. This condition holds, except in the special case of 'fully informed agents', who "have no need for a price mechanism to inform them about what is happening. Prices [in this case are redundant, since they] merely reflect what ... [fully informed agents] already know" [Leijonhufvud 1981:149]. It is quite clear that nominal dollars are received by economic agents and nominal dollars are advanced by and returned to financiers--no where in this economic setting is real money to be found. *Real money is a function of nominal money* and the effect of changing prices on the nominal budget of the individual financier/consumer--vis-à-vis his/her expectations of nominal returns (cash flows) from his/her earnings/ investment portfolio--is knowable only by the individual.

While the capital market prices the firm's cash flow plan (estimated future earnings to be generated in the commodity market), financial accounting measures actual current earnings (cash flows). It is well established that, in periods of changing price levels, each financier in his/her valuation model makes an adjustment to the rate of discount, by which the future cash

flows would be discounted, to compensate for any difference between what is perceived to be the 'real' rate of interest and the 'nominal' rate of interest. Thus, if firms' earnings are adjusted by a price index then the adjusted earnings information could result in distorted market prices for securities - claims against firms' future earnings. Despite the foregoing, monetarists maintain that individuals suffer from money illusion and make ill-informed decisions.

Money Illusion and Uninformed Decisions

The Wicksellian view, which persists, holds that agents are subject to money illusion [Wicksell 1935:85]. While Milton Friedman [1969] is the leading monetarist, Niehans [1978:127] adequately capsulizes the monetarists' position:

Provided consumption in a given period is never an inferior good, money illusion will distort present consumption upward at the expense of future consumption. Resources are used up that would have been necessary to maintain the capital required to provide for the hoped-for future consumption. . . . [F]or the accountant it appears in the form of a firm that determines its profit distributions in such a way that capital, in money terms, just remains intact. Such a firm will later find that its owners have actually dissaved consuming capital in the guise of profits.

In periods of rising prices, it is held that business profits are overstated and must be adjusted to prevent economic agents from making incorrect decisions. The issue to be addressed is whether agents are informed by the signals generated with nominal prices or by the information generated with recommended adjustments for the effect of inflation.

ANALYSIS

Inflation being defined as the sustained increase in the general price level, money is held to be unstable; thus, it must be held constant in order to measure. The difference between unadjusted and adjusted measurements would constitute the impact of inflation. Given this information, *agents are supposedly informed on their ability to consume.*

Maintenance of physical capital emerges as the critical concern. However, adherence to this concept in measuring business income is a misapplication of a social income concept.

Reasoning along the line developed by MacCormac [1976:129], the myth, that inflation impinges upon the profits of business firms, arises from the false attribution of reality (the increase in consumers' cost of living) to a tension-filled suggestive root-metaphor (business firms are unknowingly consuming their capital). The problem is one of perception.

Changes in commodity prices alter the physical relation underlying dollar values. This condition engenders a perceived need to preserve the physical quantity relationship and real terms calculation is advocated. However, to alter financial data to reflect physical volume data introduces a problem of misinformation into the system. This condition obtains because adjustment of the money value assigned in an exchange transaction alter the signals generated by the system. Such information alteration would reduce the informedness of agents.

The Consumption Model and Social Income

The preference for physical (real) capital stems from a carryover from the classical economists in the analysis of a subsistence economy. Corn, in their analysis, was both the capital and the consumable good. The only way for that society to survive is by ensuring that the *physical quantity* of corn at the beginning of the period is withdrawn at the end of the period from the current harvest. *After this withdrawal, what is left is social income--that which is available for consumption by (or is distributable to) the laborers in the subsistence economy* [Mill 1830:89]. In such an economy, if the physical quantity of corn is not preserved (physical capital is not maintained) at least (and increased at best), then the inhabitants would be faced with famine, and continued diminution of the physical capital would mean annihilation of that society [Mill 1844:242].

Seemingly, Hicks' [1939] consumption definition of income is derived from the corn analysis. Upon recognizing that uses of his income definition have resulted in many fruitless debates, Hicks [1942:133] cautioned about its limitations. Hicks' caution is not surprising, since his definition can be traced to John Stuart Mill's [1830:89] and James Mill's [1844:75-84] definitions of social income which established the purpose of maintaining physical

capital as a nation. So, while some theorists may be preoccupied with the maintenance of physical capital,⁶ it is inapplicable to firms' decision-making and performance measurement.

Decision-Making and Performance Measurement

The fact that prices have risen does not signify that the measurement unit is defective. A rise in factor prices signals that more money-capital is required to operate at a former physical level. Given the allocative mechanism at work, the physical level of operations for any given period is determined by consumer demand and the availability of money-capital. As long as consumers are willing to pay, the financing to maintain or increase the former physical level of output will be secured from the capital market.

Based upon the budgetary process, since producers incorporate anticipated changes into their budgets, any change from nominal money to real (constant) dollar accounting for the purpose of income determination will involve double counting [Bierman 1971:696]. It has been demonstrated "that the adjustment of book values for changes in the price level biases estimates of the expected overall and period rates of return. The magnitude and direction of these biases are dependent . . . on the precise changes in the index of prices used for such adjustment."

The use of real (*constant*) dollar accounting for the purpose of physical comparability is not being questioned. However, to be meaningful in a decision making context, it has to be applied on an individual specific basis. Its relevance depends on the goods and services that enter into the specific budget of the individual. Since each production plan is expressed in nominal money terms, the return on finance should be measured in current nominal dollars. Then, this nominal return should be adjusted on an individual basis by the specific change in the individual's cost of living, and compared to the nominal interest rate.

In a *nominal dollar(cash) flow system*, it is difficult to envision how a constant dollar measure of a firm's cash commitments and activities can serve the firm's needs far less the individual shareholder given the fact that signals are in nominal money terms. It may be for this

very important reason that Patinkin (1961) maintained: "[A]n essential condition for monetary control of the price level is that the central bank practice 'money illusion' with regard to the supply of the relevant monetary aggregate. That is, although the demand for the monetary aggregate is in real terms, the central bank must focus on establishing and maintaining its policy in terms of the nominal supply of the monetary aggregate" [Boschen 1990:94].

The Relevance of Nominal Money Prices

One aspect of Rational Expectations (RE) holds that the formation of expectations is specifically dependent on the structure of the relevant system which describes the economy. Relative prices, expressed in nominal money terms, mobilizes a money economy by effecting allocation decisions. An illustration involving pure exchange (which could be extended to include production and distribution) follows:

Assumptions:

1. There are three commodities: wheat (W), corn (C), and rice (R).
2. The established ratios of exchange (in bushels) are as follows:
 $1W = 2/3C$ or $1C = 1\frac{1}{2}W$; $1R = 3W$ or $1W = 1/3R$; and $1C = 1/2R$ or $1R = 2C$.
3. The system is monetized and the commodities are quoted in money terms (price):
(a) 1W exchanges for \$2; (b) 1C exchanges for \$3; and (c) 1R exchanges for \$6.
4. Quantities produced for final consumption and sold in a competitive market are:
12W, 8C, and 4R; a total of 24 bushels of mixed output.
5. The money supply (M) is \$36.
6. The velocity of money (V) is 2 times.

Given the above, national income (Y) equals \$72 ($12W \times \$2 + 8C \times \$3 + 4R \times \$6 = \$24 + \$24 + \24). The price level (P) is Y/Q ; where $Y/Q = \$72/24$ bushels, and P is a weighted average price of \$3. Now assume that there is an increase in the money supply of \$12 ($\Delta M = \12) - M is now \$48. This condition, according to the monetarists, would cause the price level to rise from \$3 to \$4. Since Q and V are unchanged, this price level change comes about by inserting the values of the variables into Equation 1:

$$P = (MV)/Q = (\$48 \times 2)/24 = \$4 \quad (1)$$

The general price level has increased. While all absolute (nominal money) prices have increased, the relative prices have remained intact. Now, it takes \$4 to buy what \$3 bought in the preceding periods; and the monetarists maintain that the dollar has lost value. Given the mathematics outlined above the conclusion is true. However, for the conclusion arrived at above to hold in the real world, two conditions are required:

1. The increase in money must be held proportionally by the various consumers.
2. Consumers, having more money, will spend - buy more things, even more of the same things - rather than save.

The necessary conditions are due to the assumption of the neutrality of money which reduces money to a veil under which transactions are executed. The implications of the neutrality assumption are:

1. In the long run, if not in the short run, the exchange value for all three commodities would be \$96, regardless of how the change in money supply (ΔM) was divided among all consumers.
2. Consumers will not save any extra money received but will simply spend all of it.

However, money is not a veil [Newlyn 1962:92], and consumers' actions will drive prices up if, and only if, the economy is operating at full capacity: (1) plants are operating to the maximum; (2) all able-bodied individuals and marginal workers are fully employed; and (3) inventories are depleted. In this setting, there can be no change in output only a pure rise in prices. The fixed output assumption is valid in the special case of crop failure, in which case only price is affected. In the general case, output is variable and not fixed; hence, the transmission process is from Y to M. As the model becomes more general, the more numerous are the Y sources of causality [Horwich 1964:448-449]. Thus, "the quantity theory, once released from the assumption that output is fixed offers no theory of the extent of the effect of changes in M on prices and real output" [Chick 1973:53].

In the scenario above, savings is ruled out--the marginal propensity to consume is 1.⁷ “If the disturbance takes the form of an unexpected change in the quantity of money, the transactions cost hypothesis presumably would argue that money holders would passively accept much of the portfolio disequilibrium in the short run and only gradually work it off over time by adjusting their spending” [Judd and Scadding 1982:1012].

Contradictions of reality emerge when conclusions are deduced from the analytic model, Equation (2).

$$\Delta P = f(\Delta M) \tag{2}$$

where P is endogenous and M is exogenous. It is implied in the monetarists' position that the satisfaction derived by an individual from a particular commodity in year 1 is identical to the satisfaction derived from the same commodity in year 2; thus, the price of that particular commodity in year 2 ought to be no different from the price in year 1. If taste is a physical constant, then change in relative prices cannot be a function of changes in demand and supply conditions. Hence, no change in P can occur as a result of: (1) advances in technology (e.g., the effect of technology on the price of calculators) or change in institutional setting (e.g., unions' demand for higher salaries), and (2) changes in consumer taste; the price elasticity of demand is inoperative. Given the foregoing, the monetarist position is untenable.

An Analogy with Time

Relativists see money as a device for expressing in an uniform manner the purchasing power relationships of the many commodities that are available for exchange. Just as time puts events into perspective [Reichenbach 1963:144], money--the unit of account--puts events into perspective [Montague 1925:129,255]. An individual today can do much more in one year than an individual who lived one hundred years ago. Due to technological advances (e.g., computers, airplanes, etc.), the difference in accomplishments is staggering. Does it mean that the time measure is defective, and there is need for a real time/nominal time dichotomy? Not really! Time is a relative reference frame: a coordinative definition

supplied by the equations of mechanics [Reichenbach 1963:147]. Likewise, money is a relative reference frame.

INFORMATION UNDER MONETARISM

The remaining aspects of RE are (1) information is scarce and it is not wasted by the economic system, and (2) the operation of the economic system will not be substantially affected by a public prediction, unless such prediction is based on inside information [Muth 1961:316]. "Rational expectations implies that agents understand the connection between money and the price level and that they correctly anticipate the systematic components of government monetary policy" [Hoover 1984:61]. On this basis, the money supply rule is ineffective. Also, since it influences the nominal interest rate, it can have an adverse impact on the Fisher hypothesis. Then, how useful is the information generated under monetarism?

Based upon the earlier illustration, Table 1 below provides information on changes in output and the resulting effect on the price level. Three new assumptions are added: (7) A change in taste has occurred and some consumption has shifted from W to C. (8) Excess capacity exists. (9) There are changes in prices of the factors of production for W and C. Assumption (9) was made for ease of analysis. However, had a price change been assumed also for R, the amounts in question would differ but the results of the analysis would not be affected. Assumptions 1, 2, 5, and 6 in the original model are retained, while 3 and 4 are modified. Assumption 6 reflects the long run, while assumption 5 is needed in the short run. Modified Assumptions: (3) Prices respond to change in consumer taste: W - \$3.25; C - \$2.50; and R - \$6.00. (4) Quantities produced for final consumption and sold are: 8W, 12C, and 4R; a total of 24 bushels of mixed output.

In Table 1, both indices (Laspeyeres and Paasche) reflect an increase in the general price level which was caused by a realignment of prices due to the change in consumer taste. Given a monetarist approach, a sustained change in the general price level would warrant a monetary policy reaction to prevent further increases in the price level. However, assuming

no change in monetary policy to adjust for the change in the general level of prices, the results that would obtain in the short run would be a change in velocity given that M (\$36) is fixed in the short run. Thus, the dynamic adjustment of the model is a change in V.

TABLE 1
Impact of Change in Output Mix and Relative Prices on Velocity

	<u>Commodity</u>			
	<u>W</u>	<u>C</u>	<u>R</u>	<u>Total</u>
Price	\$ 3.25	\$ 2.50	\$ 6.00	-
Units (bushels)	8	12	4	24
Exchange Value	\$26.00	\$30.00	\$24.00	\$80.00

$$\underline{\mathbf{P = MV/Q = \$80/24 = \$3.33}}$$

	<u>Short Run</u>	<u>Long Run</u>
Total Value of Output	\$80.00	\$80.00
Money Supply	\$36.00	\$40.00
Velocity	2.22	2.00
Average Price Level	\$ 3.33	\$ 3.33
Price Level Index: <i>Laspeyres</i>	1.153	
<i>Paasche</i>	1.053	

Since MV equals \$80 and M equals \$36, then V is 2.22. In the long run, given the endogeneity of money, M will adjust (until it equals or approximates \$40) to satisfy the demand for money. After this adjustment, assuming that a velocity of 2 is the effective level for the system, the behavior pattern in the average velocity (which would be about 2) would be reestablished.⁸

How is it that the general price level has changed from \$3.00 to \$3.33 in the short run with no increase in the money supply? The monetarist answer may be implied in Hartman [1991:202]; that is: "relative price variability, inflation, unanticipated inflation, and the change in the inflation rate are jointly determined endogenous variables which depend on the

same underlying random disturbances." This answer does not dispel the relativist argument that the change in the price level (ΔP) reflects the net effect of the realignment among relative prices, and the direction of causation is not from M to Y but from Y to M.

Assume that W, C, and R represent different bundles of goods that are reflected in the budgets of different individuals. The *next question to be answered is*: how can a producer or a consumer of W, C, or R--use the average purchasing power or the general price level as a guide? It reflects nothing about W, C or R. It is an average of a heterogeneous grouping, which can change as a result of a change: (1) in the output mix (due to a change in taste), or (2) in the exchange relationships among the commodities (change in technology). Given information on the general basket which is produced and disseminated under the monetarists' approach, it is argued that agents are not as informed as they should be. This situation may explain the contradiction of the Fisher effect.

Contradiction of the Fisher Effect

Fisher [1930] held the view that the real and monetary sectors are causally independent. The Fisher hypothesis holds that expected nominal rates of return on assets should move on an one-to-one basis with changes in the general level of prices. Quite frequently however, empirical studies [Bodie 1976; Kaul 1987; Marshall 1992] have revealed that stock returns are negatively related to both expected and realized changes in the general level of prices. Boudoukh, et al. [1994] have attempted to explain the contradiction and show that the Fisher effect holds in the long run.

While the empirical evidence contradicts the Fisher hypothesis, it is consistent with financial theory. Real assets generate nominal cash flows, and the rate of discount of these nominal cash flows are affected by the extent that anticipated changes in the general level of prices are reflected in the nominal interest rates. This position is now explored. The important variables are: C - expected cash flow; F - money market value; D - bond value; S - stock value; r - real interest rate; R_n - nominal interest rate; π - expected rate of change in

the general price level; R_S - expected return on stock; R_M - expected rate of return on money market fund; R_D - expected rate of return on bonds; ϕ - risk premium on stock; and τ - risk premium on bonds; and ξ - an error term. The following relationships hold:

$$R_{nt} = \pi_t + r_t + \xi_t; \quad (3)$$

$$R_{mt} = R_{nt}; \quad (4)$$

$$R_{st} = R_{nt} + \phi_t; \quad (5)$$

$$R_{dt} = R_{nt} + \tau_t; \quad (6)$$

$$F_t = CF_{tn}(R_{nt})^{-1}; \quad (7)$$

$$D_t = CD_{tn}(R_{dt})^{-1}; \quad (8)$$

and

$$S_t = CS_{tn}(R_{st})^{-1}. \quad (9)$$

Holding ϕ_t and τ_t constant, if $R_{nt+1} > R_{nt}$, then $R_{dt+1} > R_{dt}$ and $R_{st+1} > R_{st}$. In addition, holding CD and CS constant, then $D_{t+1} < D_t$ and $S_{t+1} < S_t$. This latter condition would hold also if the rate of growth in CS is less than the rate of expected change in the general level of prices. Thus, as the rate of the general level of prices increases, the value of D and S decreases. However, while the cash flows from D is constant, the cash flow from S in a growing economy increases, making S a good hedge against inflation. Also, even in the absence of any growth in cash flow from S , the increase in the demand for stock as a hedge against inflation can produce results that would be in line with the Fisher effect.

Evans and Lewis [1995] contend that when people incorporate anticipated shifts in the inflation process into their expectations, an apparent permanent component in ex post real interest rates surfaces. It is this factor they contend that creates the anomaly. Using a Markov switching model of inflation, in which the anticipated shifts are accommodated, Evans and Lewis [1995] maintain that the Fisher hypothesis holds in the long run. However,

this paper suggests that empirical finding on the anomaly holds and the shifts are due to the signals generated by monetary policy.

CONCLUSION

Nominal money prices, specific price changes, and rates of return on nominal money guide output decisions for physical quantities. These variables constitute the reality facing economic actors, and they respond to these factors. In any given period, all prices do not rise simultaneously; but rather some prices rise, some fall, and others remain unchanged. The net effect of this realignment of prices is a change in the general price level.

With price level changes, the money supply adjusts itself to accommodate the change in demand for money. Also, given an ad hoc interest-rate policy of banks, firms adjust their credit policies to accommodate their customers. Thus interest rates can be high yet produce no lowering effect on the general level of prices. The preponderance of empirical evidence supports the view that money is an endogenous variable. If inflation is not induced by fiat money, then monetary policy based upon the quantity theory of money is likely to confound the signalling ability of nominal money prices.

ENDNOTES

- 1 Jean Bodin (1568) posed the first opposition to the *theory* in the work entitled: "Reponse aux Paradoxes de M. de Malestroit touchant L'Encherissement de toutes Choses et des Monnayas." [Greidanus 1950:10]. The English translation [Moulton 1958:4] is "Reply to the Paradoxes of Malestroit Concerning the Dearness of All Things and the Remedy Therefor." According to Burdekin and Weidenmeir [2001:1621], the preponderance of research do not support the contention that "the drastic change in the quantity of money led to an equally drastic change in the price level" of the Confederate economy in 1864.
- 2 For an in depth view of this position, see Friedman [1958;1969].
- 3 Hayek [1932:106] maintains that: "The assertion that changes in the *general* level of prices must always originate on the monetary side, ... obviously depends on circular reasoning. It starts from the postulate that the amount of money must be adjusted to changes in the volume of trade in such a way that the price-level shall remain unchanged. *If it is not, and the volume of money remains unaltered, then, according to this remarkable argument, the latter becomes the cause (!) of changes in the price level.*"

- 4 "... [T]he Quantity theory is valid as a long-term equilibrium condition; but in the short period, while the supply of money is increasing, the increase can be a real stimulus [to economic activity]." [Hicks 1967:161].
- 5 According to Hayek [1932:44], if money is a commodity, it is unlike all others because it is incapable of satisfying final demand.
- 6 As a derivative of the *consumption model*, the concept of distributable operating flow was developed by Revsine [1973]. This concept was refined as a distributable income concept by Vancil and Weil [1976]. However, the *consumption model*, which applies to society as a whole, serves as the rationale for the espousal of *real terms calculation*.
- 7 According to Myrdal [1939:22]: "savings is excluded ex hypothesi."
- 8 Some empirical evidence on the adjustment in velocity to compensate for an excess in the money supply is provided by Poole [1988:73,74,78,97]

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