

# Monetary Policy And Not Monetary Control: A Rethinking

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## Abstract

*The view that prediction is the only important concern when policy is to be developed has led to the strict adherence to a money supply rule via the Quantity Theory of Money with its debilitating consequences. The monetarists place the emphasis on the level of the money supply in the determination of price level changes and monetary control is exercised. Along with this line of thinking, statistical elegance transcends empirical reality. Thus, the ensuing consequences of monetary control are not surprising. There are continuous increases in the general level of prices and increasing problems of unemployment, which fuel the flames of business downsizing. In this paper, an alternative to the monetarist explanation of the determination of the price level is advanced. The alternative explanation does not rely on changes in the supply of money but on changes in the composition of aggregate demand and supply. Absent monetary dislocation or revaluation of the currency, change in the general price level is attributed to the net effect of the realignment of relative prices. It is argued that a rethinking of the situation would result in monetary policy that is compatible with the economic setting and not monetary control which crowds out fiscal policy.*

## Introduction

**R**asche and Johannes (1987, p. 187), in their empirical work using simple time series forecasting procedure, concluded that the money stock in the U.S. appears to be controllable. However, notwithstanding the ability to accurately forecast the money multipliers, they raise a significant question: Should monetary control be a serious policy objective? The question emerges because of the endogenous nature of money there is a very heavy cost to society in terms of unemployment for controlling the money supply. Poole (1990, p.38) also raised

a similar question. If money is endogenous to the system, then policymakers have to consider rather seriously whether monetary control is desirable. It is argued in this paper that policymakers should focus on monetary policy consistent with the institutions and functioning of the economy and not on monetary control. For example, monetary policy should be concerned with the effect of the ability of business firms to accommodate price increases by extending the length of the repayment of credit. The current problem lies with the fact that monetary control (as advocated by the monetarists) reflects a concern for the ability to use statistical goodness of

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fit for prediction--predictive ability--rather than epistemological relevance for explanation.

The foregoing concern has not escaped attention. For example, Rogerson (1997, p. 86), while discussing the related issue of the natural rate of unemployment, maintains: "There is apparently a great deal of confusion between getting more precise specifications of one particular ad hoc rule for monetary policy and getting a better understanding of what constitutes good monetary policy. I do not see how the issue of understanding what constitutes good monetary policy is related to getting smaller standard errors on the estimated coefficients of a regression of changes in inflation on unemployment." In great part this problem is due to the continued adherence to instrumentalism (See Appendix).

This paper advocates a rethinking and offers some insights into general price level changes. This research follows the thinking of Galbraith (1997, p. 106), who stated in unequivocal terms that: ". . . the measure of scientific maturity lies in a willingness to match theory with evidence, to discuss anomalies with an open mind, and to move on when it is appropriate to do so. Occasionally, this may mean reconstructing one's thinking from the ground up."

### *The Monetarist Dilemma*

The monetarist model crashed in the 1980s, when small increases in the general level of prices became associated with more rapid growth of the money supply. Growth in the money supply (M1), from 1975 to 1982, averaged slightly over 7 percent per year, while the GNP implicit price deflator rose on average at a rate of 9 percent (Boschen, 1990, p. 84). Since 1982, however, while growth in the general price level has averaged just 3.5 percent, the average annual growth of M1 has accelerated to 9.5 percent (Walsh, 1990, pp. 8-9,186) and the velocity of money has declined (Fisher, 1989, pp. 156-158).<sup>1</sup> Nominal money prices are signals informing agents of changes in the relative exchanges among commodities, and monetary policy should facilitate the execution of transac-

tions. Instead, the money supply rule, via the Quantity Theory, confounds the signaling 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.* Changes in the price level are not a monetary phenomenon. Given price level changes as inherent in the price system, then there are two ways to eliminate changes in the general level of prices, and neither one is beneficial to a healthy exchange economy. One of the two ways to eliminate changes in the price level is to resort to customary prices; but then the price system would be ineffective in signaling changes in the environment. The other way is to use monetary policy to reduce the level of employment which will have a drastic effect on demand, and hence on prices. If, as argued in this paper, that changes in the general level of prices is not induced by money but is a function of the price system, then no amount of control of the money supply can eliminate it without producing serious distortions of the functioning of the economic system (e.g., unemployment and business downsizing). Simply put in analogous terms, if there is no air in a tire, then air cannot be removed from the tire!

The persistence of changes in the general level of prices despite many years of monetary control has produced a clear indication that inflation (sustained change in the general level of prices) is not a monetary phenomenon. The fact that changes in the general level of prices cannot be eliminated by monetary control has become evident to monetary authorities, who have reluctantly accepted what is called underlying or core inflation. Today one finds that zero inflation is not considered feasible; a few percent changes in the general level of prices is considered as normal, because it simply cannot be eliminated. The component of inflation, which is accepted as normal, is termed core inflation or underlying inflation (Quah and Vahey, 1995, p. 1130; Pavalone, 1995, p. 31).<sup>2</sup>

*Collapse of the Money Demand Function*

In light of the collapse of the assumed stability of the demand-for-money function, more attention has to be directed to the vast amount of empirical evidence which "supports the hypothesis that long-term as well as short-term financial assets are substitutes for money." This development has prompted Hamburger (1977, 1966): (1) to add the yield on equities to the explanatory variables of the demand-for-money function, and (2) to introduce the dividend-price ratio of common stocks and to substitute a 20-year government bond rate for the three months Treasury Bill rate in the demand-for-money equation. It is argued by Hamburger that the dividend-price ratio represents an indicator of the yield on all physical assets; thus, it is an appropriate alternative opportunity cost of holding money. Hamburger's recommendation, according to Grivoyannis (1991, p. 101), suggests that "there is more certainty . . . of observing shifts between money and bonds or between money and equities when the yield on financial assets and equities change than there is in observing shifts between money and savings deposits or between money and Treasury Bills when short-term interest rates change".

Marshall (1992, pp. 1318) maintains that: "[T]he difference between inflation-asset return [negative] correlation and money growth-asset return [positive] correlation is inconsistent with the view that inflation is a purely monetary phenomenon." Also, Marshall (1992, p. 1339) provided evidence "that substantial negative correlations between real asset returns and inflation do not constitute evidence of money illusion or market inefficiency . . ." Thus, if inflation is not a monetary phenomenon, then control of the money supply 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; 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, p.

71). The implication for the monetary authority is the need to eliminate the reactionary approach to monetary policy--the current ad hoc interest rate policy in the short run interferes with price signaling and in the long run crowds out fiscal policy.

**The Quantity Theory: An Overview**

Wicksell (1935; 1936) maintained that 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. It is held that a special proportionality relation exists between the quantity of money and commodity prices (Wicksell, 1935, pp. 136, 141). This condition makes it possible to control the price-level by controlling the money supply. As a result of this line of reason, 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 in conjunction with an appropriate theory of economic behavior, negated the validity of the Quantity Theory. Wicksell (1935, pp. 185, 207-208) concluded that the reversal of Tooke's interpretation of his findings would lead one to the correct interpretation, which supports the Quantity Theory. However, a multitude of past and current research continues to provide 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, p. 532)."

*Money and Price Level Changes*

To Wicksell (1935, p. 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, pp. 254-255) maintains that inflation (wherever its presence happens to be observed) is a monetary phenomenon.<sup>3</sup> 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, p. 74; Gould, 1965, pp. 94-96, 108, 109). Evidence for twenty countries for a period of about eight years contradicts Friedman's hypothesis (Fellner, et al., 1964, p.13). Meltzer (1977, pp. 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, p.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, pp. 69, 77; Goodhart, 1975, pp. 199, 216, 217; Hansen, 1951; Harrod, 1973, p. 82; Hawtrey, 1950, Chap.1; Holtfreich, 1986). Inflation is attributable to non-monetary factors (Dow and Saville, 1988, p. 240); it is to be found in a barter economy (Fuller, 1980, pp. 6-7). 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, pp. 532-

533, 535, 542-543; 1985b, pp. 1193-1196). Such evidence may account for the fact that Friedman and Schwartz (1982, pp. 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, pp. 70-71)."

In a very sanguine assessment of Friedman's work, Clower (1971/1984, p. 118) 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."

#### *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 those assumptions is that any change in the supply of money is offset by a change in the general level of prices to restore the general equilibrium between markets.<sup>4</sup> The neutrality assumption precludes the accumulation of money in its own right. However, money is not neutral<sup>5</sup> and it is not a commodity with the usual com-

modity effect.<sup>6</sup>

In the presence of thriftminded individuals, a change in the money supply will not, of itself, produce a change in the price level. Of empirical significance is the evidence on savings in light of an increase in the money supply. During the late 1980s, the Chinese government (central bank) issued credits of approximately 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, pp. 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, pp. 8-9, 186 and Fisher, 1989, pp. 156-158). Except for a few rare instances, the two aforementioned conditions do not materialize.

The monetarists' position, that only changes in  $M$  produce changes in the price level, 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, p. 1219). The monetarists argue for causation from  $M \rightarrow Y$ . However, Samuelson (1965, p. 103) has pointed out that "[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."

*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.* However, this 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. Consequently, given the explained sustainability of an increase in the general level of prices, for inflation to be truly 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.

Historically, in all the major inflationary situations, neither one of the two situations above accounts for the loss in value of money (Bresciani-Turroni, 1937, chap. IV). The monetarist view obtains only when there is a loss of confidence which brings about a repudiation of paper money. The loss of confidence, a "crisis of doubt" (Bresciani-Turroni, 1937, p. 172), 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 U.S. dollar is the preferred means of saving (Vasiliev, 1994, p. 134).

The usefulness of the equation of exchange ( $MV = PQ$ ) is not being questioned. However, since it is a tautology, the equation of exchange can not provide any answers. Furthermore, the use of index numbers is accepted as valid and appropriate for some types of physical productivity measures, under some very restrictive assumptions about utility and production

functions. Also, the use of real (constant) dollar measurement 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.

### **The Relativist View: An Alternative To The Monetarist View**

The economic system is plagued by the staunch adherence to a theory, which was developed in times of commodity money and does not accord with the facts. An alternative (relativist) view to the Quantity Theory of Money (monetarist view) is offered in this paper. The relativist view 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* (Salvary, 1996a, 1996b). This view is consistent with the fact that change in the general level of prices (a rise or fall in the average of all prices) is inherent in the price system. Changes in nominal money prices constitute an efficient signaling of the effect of changes (taste, technology, and income) taking place in the economic system. Commodity prices are affected by changes in taste, technology, income, and population growth; and with changing conditions, the entire set of exchange ratios are realigned producing an increase or decrease in the average of all prices. This condition entails redistributing exchange (purchasing) power among the members of that society. Therefore, absent 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.

While Y exists in the absence of M (Arrow, 1981 p. 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, causa-

tion 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. From the perspective of the relativists, M is a separate and distinct factor in the production process and the rate of return on nominal money invested influences output. The relativists' position that M is endogenous is supported by empirical evidence which 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, pp. 1001-1005, 1013). Hendry and Ericsson (1991, p. 32) further reinforce this point.

The relativists, who are guided by: (1) nominal interest rates (which reflect anticipated changes in the general level of prices), (2) the rate of return on investment on nominal money, and (3) the effect of changes in nominal money prices on their nominal money incomes, view changes in the general level of prices as bits of information which they process when making decisions. The information (which incorporates rigid prices and wages) generated by the price system is effectively used by the relativists. However, current monetary policy (the use of high interest rate to combat a rising general price level) interferes with the signaling function of the economic system

### **The Functioning Of Money And The Money Economic System**

Money enables the transfer of purchasing power over time (Davidson, 1972, p. 62) and is a cost efficient means of transacting (Brunner and Meltzer, 1989, p. 250). While paper money has a demand and supply function, the cost for its use as an agent is not to be confused with its nominal value. Such a cost is expressed as a rate (viz. interest rate). Money is priced in terms of itself (i.e., \$1.00 = 100 cents), and its use is compensated for in terms of itself (compensation is in nominal money terms). The liquidity cost of money, and the expected change in and the

carrying cost of its nominal value are all zero. Nominal money flow is the critical dimension in a money economy because nominal money is the medium of exchange and units of uncertain purchasing power are held in the form of nominal money (Keynes, 1930 pp. 55-56).

Paper money is not a commodity; but its use--credit--is a commodity and the price of which is the interest rate. Thus, an increase in the supply of credit will result in a decline of its price 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, in international trade, paper money is akin to representative money or bills of exchange. In its domestic economy, money is an unchanging standard against which all readily reproducible capital goods and titles to capital goods and debt contracts can be measured (Davidson, 1972, pp. 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. This condition explains why financial institutions adjust their lending rates to incorporate anticipated changes in the general level of prices.

In a money economic system, which is driven by *Money-Capital, Earnings and Profit* interacting through the price mechanism, relative prices (expressed in nominal money terms) function as signals: information flow and feedback. Money prices reflect changing conditions; in so doing, the signaling function of money is fulfilled. This condition holds, except in the special case of 'fully informed agents', who do not need a price mechanism to inform them about changing conditions. Prices in the case of fully informed agents are redundant, since they merely reflect what these agents already know (Leijonhufvud, 1981, p. 149). In this economic setting, there is only nominal money-- nominal dollars are received by economic agents and nominal dollars are advanced by and returned to financiers.

*Real money is a function of nominal*

*money* and the effect of changing prices on the nominal budget of the individual financier/consumer is knowable only by the individual. 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, p. 94).

### **Control Of The Money Supply And Behavior Of Economic Agents**

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. The fixed output assumption under monetarism 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, pp. 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, p. 53).

For example, how is it that the general price level changes in the short run with no increase in the money supply? The monetarist answer may be implied in Hartman (1991, p. 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: (1) relative prices, expressed in nominal money terms, mobilizes a money economy by effecting allocation decisions, (2) changes in the price level ( $\Delta P$ ) reflect the net effect of the realignment among *relative*

prices, (3) the direction of causation is not from M to Y but from Y to M. All the economic system account for the exogeneity of Y.

Consequently, contradictions of reality emerge when conclusions are deduced from the monetarist's model, Equation (1).

$$\Delta P = f(\Delta M) \quad (1)$$

Given the endogeneity of P and the exogeneity of M in the model, it is maintained that: "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, p. 1012). This response is derived from the monetarists' implicit assumption 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 the 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; in the latter case, the price elasticity of demand is inoperative.

Given the analysis which preceded this section, the monetarists' position on *monetary control* results in the malfunctioning of the economy and should be replaced by *monetary policy* which is consistent with the functioning of the economic system and the nature of money. For instance the impact of the accommodation of the banks to price increases is clearly demonstrated in the case of the extension of the repayment periods for automobile and mobile home loans. "Seventy-nine percent of all new-auto loans booked by respondents in 1994 had maturities

exceeding 48 months . . . One method by which banks appear to be competing with finance companies is to offer longer maturities and, other things being equal, lower monthly payments. During 1994, 15 percent of banks' new-auto loans were over 60 months, a significantly higher portion than the three percent reported by finance companies. These longer maturities on new car loans by banks may reflect their effort to compete with the low monthly payments on auto leases offered by the finance companies." The statistics (Table 1) for those loans are quite revealing and the effect (no correlation between the change in the prime rate of interest and the change in consumer loans) indicates that monetary control is thwarted.

#### *Decision-Making and Use of Information*

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, p. 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, p. 61). On this basis, the money supply rule is ineffective. Furthermore, since it influences the nominal interest rate, it can have an adverse impact on the Fisher hypothesis.

Another concern is the effect of monetarism on the generation of financial accounting information. Under the definition of inflation as the sustained increase in the general level of prices, it is held that the unit of measurement--money--is not stable; thus, it is necessary to hold the money unit constant in order to measure. 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. The difference between the unadjusted and adjusted (real terms) measurements would constitute the impact of inflation.



**Table 1**  
**Consumer Loans Outstanding, Repayment Periods, And Interest Rate**

Year	Consumer Loans Outstanding (\$Billions)				Repaid (#mos.)		Annual Average Prime Interest Rate
	Total	Auto- Mobile	Mobile Home		Automobile New	Used	
1978	308.3	98.7	16.9				9.06
1979	347.5	112.4	18.2				12.67
1980	349.4	111.9	18.6	45.0	34.8		15.27
1981	366.6	118.9	20.3	45.4	35.8		18.87
1982	381.1	124.2	22.8	46.0	34.0		14.86
1983	430.4	143.7	23.7	45.9	37.9		10.79
1984	442.6	173.6	25.7	48.3	39.7		12.04
1985	517.7	210.2	26.8	51.5	41.4		9.93
1986	572.0	247.8	26.8	50.0	82.6		8.33
1987	608.7	266.3	25.9	53.5	45.2		8.20
1988	663.0	285.5	25.3	56.2	46.7		9.32
1989	724.4	292.5	22.5	54.2	46.6		10.87
1990	734.9	283.1	21.0	54.6	46.0		10.01
1991	728.4	259.6	19.1	55.1	47.2		8.46
1992	731.1	257.7		54.0	47.9		6.25
1993	794.3	282.0		54.5	48.8		6.00
1994	911.3	324.5		54.0	50.2		7.15
Correlation with change in prime rate of interest							
Correlation coefficient:		Δ Total (n=16)				0.047361	
		Δ Autos (n=16)				0.032387	
		Δ Mobile Homes (n=13)				-0.043900	

Sources: *Statistics Abstract of the United States*, 1970-1996.

Given this information, agents are supposedly informed on their ability to consume.

The maintenance of physical capital emerges as the critical concern.<sup>7</sup> However, alteration of financial data to reflect physical volume data introduces a problem of misinformation into the system. This condition obtains because any adjustment of the money value assigned in an exchange transaction may alter the signal generated by the system. Such information alteration could reduce the informedness of agents.

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. Given the information generated by nominal money prices, it is argued that: (1) agents are not as ill-informed as the monetarists maintain, and (2) the contradiction of the Fisher effect can

be explained as an effect of information generated by monetary control.

*Contradiction of the Fisher Effect*

Fisher (1930) believed that the real and monetary sectors are causally independent. According to the Fisher hypothesis, expected nominal rates of return on assets should move on a one-to-one basis with changes in the general level of prices. However, quite frequently, 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. An attempt has been made by Boudoukh, et al. (1994) to explain the contradiction and show that the Fisher effect holds in the long run. Evans and Lewis (1995) maintain that when anticipated shifts in the inflation process are incorporated by people into their expectations, an apparent permanent component in ex post real interest rates surfaces. It is this factor they contend that creates the anomaly. Accommodating the anticipated shifts in a Markov switching model of inflation, Evans and Lewis (1995) maintain that the Fisher hypothesis holds in the long run. However, Salvary (1996a) argues that the anticipated shifts in the inflation process are due to the signals generated by current monetary policy, which adheres to the monetarist school of thought.

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. 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). Since financiers do adjust their rate of discount, if firms' earnings are adjusted by a price index then the adjusted earnings information could result in distorted market prices for securities--the claims against firms' future earn-

ings.

The foregoing proposition can be explored using the following variables:  $R_n$  - nominal interest rate;  $R_m$  - expected rate of return on money market fund;  $R_d$  - expected rate of return on bond;  $R_s$  - expected rate of return on stock;  $\phi$  - risk premium on stock; and  $\tau$  risk premium on bonds;  $r$  - real interest rate;  $\pi$  - expected rate of change in the general price level; and  $\xi$  - an error term;  $F$  - money market value;  $D$  - bond value;  $S$  - stock value;  $C_{Fm}$  - expected cash flow from money market instrument;  $C_{Dm}$  - expected cash flow from bond;  $C_{Sm}$  - expected cash flow from stock (Salvary, 1996a). In this setting, the following relationships hold:

$$\begin{aligned}
 R_{nt} &= \pi_t + r_t + \xi_t & (2) \\
 R_{mt} &= R_{nt} & (3) \\
 R_{st} &= R_{nt} + \phi_t & (4) \\
 R_{dt} &= R_{nt} + \tau_t & (5) \\
 F_t &= C_{Fm}(R_{nt})-1 & (6) \\
 D_t &= C_{Dm}(R_{dt})-1 & (7) \\
 S_t &= C_{Sm}(R_{st})-1 & (8)
 \end{aligned}$$

When  $\phi_t$  and  $\tau_t$  are held constant, if  $R_{nt+1} > R_{nt}$ , then  $R_{dt+1} > R_{dt}$  and  $R_{st+1} > R_{st}$ . In addition, if  $C_D$  and  $C_S$  are held constant, then  $D_{t+1} < D_t$  and  $S_{t+1} < S_t$ . The latter would obtain also, if the rate of growth in  $C_S$  is less than the rate of expected change in the general level of prices. Therefore, as the rate of the general level of prices increases, the value of  $D$  and  $S$  decreases. However, the cash flow from  $S$  in a growing economy increases while the cash flows from  $D$  is constant. While this condition makes  $S$  a good hedge against inflation, 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 which would be in line with the Fisher effect (Salvary, 1996a).

It is argued that given the endogenous nature of money, the money supply rule, which is an optimal search strategy (Caplin and Leahy, 1996,p.699) is ineffective; and by being incorporated into individuals' decisions, it produces anomalous behavior and helps to explain the anomalous empirical finding. The empirical evi-

dence which contradicts the Fisher hypothesis is consistent with financial theory. That is, nominal cash flows are generated by real assets, and the discount rate of these nominal cash flows are influenced by the extent to which anticipated changes in the general level of prices are reflected in the nominal interest rates.


### **Conclusion**

Nominal money prices, specific price changes, and rates of return on nominal money guide the output decisions for the 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 control based upon the quantity theory of money is likely to confound the signaling ability of nominal money prices leaving anomalies in its wake. A proper functioning of the economy requires sound monetary policy, one that would limit the extension of credit and repayment periods for consumer loans. Such a monetary policy, by removing the upward push on consumer goods, would be compatible with fiscal policy and enable an amelioration of the chronic unemployment situation, which is accompanied with business downsizing.

### **Suggestions For Future Research**

The money and capital markets have experienced significant changes over the last twenty years; growth in money market funds and mutual

funds has been phenomenal, and a new set of financial instruments (called derivatives) has emerged. Also, while the volume of trade on the stock exchanges has increased significantly, the increase in trading activities comes primarily from institutions. With these changes, the liquidity of the capital market has been altered and the accessibility to ready cash has been increased. The impact of these variables on the economy should be investigated to determine how an awareness of these variables could improve the development of monetary policy. 

### **Endnotes**

1. Some empirical evidence on the adjustment in velocity to compensate for an excess in the money supply is provided by Poole (1988, pp. 73, 74, 78, 97).
2. According to Pavalone (1995, p. 31), the CPI for all items less food and energy is often referred to as the core index or underlying rate of inflation; in 1994 this index increased by 2.6 percent. Quah and Vahey (1995, p. 1131) maintain that : "Although our method [for measuring inflation] is reconcilable with a monetary view of inflation, we do not impose this in our measurement procedure. We prefer to be agnostic on the exact determination of underlying inflation."
3. For an in depth view of this position, see Friedman (1958; 1969).
4. Hayek (1932, p. 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."
5. "...[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, p. 161).
6. According to Hayek (1932, p. 44), if money is a commodity, it is unlike all others because it is incapable of satisfying final demand.
7. 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, p. 89).

### Appendix: Instrumentalism

David Hilbert maintained that mathematics is a meaningless game, which is played with meaningless marks on paper (Bell, 1951,p.38). Hilbert introduced formalism as a methodology in which assumptions, axioms and postulates are considered as interchangeable. Ever since, most modern mathematicians hold the view that mathematics is concerned with playing a game according to a given set of rules. Given this view, it is imperative that that non-mathematicians inquire into the 'truth of mathematical propositions' (Bell, 1951, p. 23). While the relational terrain of mathematics is well defined for the purposes of mathematical investigations, in scientific investigations the deployment of mathematics as an effective tool relies on an intellectual effort which is external to mathematics for critical specification (Schwartz, 1962, pp. 356-357).

Hilbert can justifiably be identified as the source of Friedman's Positivism (1953). Friedman (1953, p. 14) maintained that: "... the relation between the significance of a theory and the 'realism' of its assumptions is almost the opposite. ... Truly important and significant hypotheses will be found to have 'assumptions' that are wildly inaccurate descriptive representations of reality, and, in general, the more significant the theory, the more unrealistic the assumptions ... ."

Boland (1978) defends Friedman on the

grounds that Friedman is adhering to an instrumentalist epistemology; that is, prediction, and not explanation, is all that is needed for policy prescription. The impropriety of such a position has been recognized in early debates on this issue. For instance, the mathematical astronomy of Ptolemy had been set aside as of no relevance, although it had proven to be far more predictively successful than the astronomy of Aristotle. A better explanation of the working of the cosmos was provided by the physical astronomy of Aristotle, therefore it was considered superior to Ptolemy's astronomy (McMullin, 1967, p. 13).

The falsity of axioms does appear in the scientific literature, but this is in context with the fact that the axioms for entirely different systems (e.g. Euclidean versus non-Euclidean systems) are invariably false for each other (Pledge, 1966, p. 189; Flew, 1989, pp. 426-427). Friedman cannot be denied the right to take an opposite view to the perceived reality, but when the evidence based upon his own model design fails to support his theory it is difficult for policy makers to justify the continued adherence to that position--monetarism.

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