2/ MILTON FRIEDMAN

Factors Affecting the Level of Interest Rates

There is a problem in terminology that is worth commenting on at the outset. In all sorts of monetary discussions, there is a tendency to use the word "money" in three different senses. We speak of a man making money when we mean that he is earning income. We speak of a man borrowing money when we mean that he is engaging in a credit transaction. Similarly, we speak of the money market in the sense of a credit market. Finally, we talk about money when we mean those green pieces of paper we carry in our pocket or the deposits to our credit at banks.

CONFUSION OF CREDIT WITH MONEY

Much of the misunderstanding about the relationship between money and interest rates comes from a failure to keep those three senses of the term "money" distinct, in particular to keep "credit" distinct from "quantity of money." In discussing credit, it is natural and correct to say that the interest rate is the price of credit. General price theory tells us that the price of anything will be lowered by an increase in supply and will be raised by a reduction in supply. Therefore it is natural to say that an increase in credit will reduce the rate of interest. That is correct. A shift to the right of the supply curve of loanable funds—that is, an increase in the supply of loanable funds at each interest rate—will, other things being the same, tend to reduce the interest rate. A decrease in supply will tend to raise it.

The tendency to confuse credit with money leads to the further belief that an increase in the quantity of money will tend to reduce interest rates, and a reduction in the quantity of money will tend to increase interest rates.

Because of this confusion, there is also a tendency to regard the term "monetary ease" as unambiguous, as meaning either a more rapid increase in the quantity of money or lower interest rates and, similarly, monetary tightness as meaning either a reduction in the quantity of money or higher interest rates.

INTEREST RATE PRICE OF CREDIT, NOT MONEY

My main thesis is that this is wrong, that the relation between the quantity of money and the level and movement of interest is much more complicated than the relation that is suggested by the identification of money with credit. It is more complicated because the interest rate is not the price of money. The interest rate is the price of credit. The price level or the inverse of the price level is the price of money. What is to be expected from general price theory is what the quantity theory says, namely, that a rapid increase in the quantity of money means an increase in prices of goods and services, and that a decrease in the quantity of money means a decrease in the price of goods and services. Therefore, to see what effect changes in the quantity of money have on interest rates, it is necessary to look more deeply beneath the surface.

Before going into the detailed analysis, let me prepare the groundwork by discussing some facts. If you ask most economists, or most noneconomists for that matter, certainly if you ask most people at savings and loan institutions or in banks, whether an increased quantity of money will mean higher or lower interest rates, everybody will say lower interest rates; but looking at broad facts shows the reverse.

If I ask in what countries in the world are interest rates high, there will be widespread agreement that they are high in Brazil, Argentina and Chile. If I say, "Take it that in those countries there are very low rates of increase in the quantity of money and that interest rates are high because money has been tight," you will laugh at me. Those are countries which have had very rapid increase in the quantity of money and inflation.

If I ask in what countries of the world are interest rates low, you will tell me in countries like Switzerland. On the usual view, this would imply that they have been having rapid increases in the quantity of money. Yet
we all know that the situation is precisely the reverse. Switzerland is a country which has held down the quantity of money.

Let us turn to the United States. Suppose I said, “What is the period in the United States when interest rates fell most rapidly?” There is not the slightest doubt when that was. It was the period from about 1929 to the mid-1930s. Would you then say, “That must have been the period when the quantity of money was increasing.” Obviously not. We all know that it is the opposite. From 1929 to 1933, the quantity of money fell by one-third and, as I shall proceed later to say, therefore interest rates fell, although in terms of the usual presumptions that economists have and which are enshrined in our elementary textbooks, one would say precisely the opposite.

Similarly, interest rates are high now in the United States in nominal terms. Nominal interest rates are far higher than they were in the mid-30s, far higher than they were just after the war. Yet, in the past five or six years, the quantity of money has been increasing relatively rapidly.

The point of this crude and rough survey of experience is to bring home to us that the broad patterns of relating events runs precisely contrary to what most of us teach our students and what is accepted almost without question by the Federal Reserve System, by bankers, by the savings and loan business.

So far I have mentioned one set of broad facts, namely, the relation between the level of interest rates and the rate of change in the quantity of money. When the quantity of money has been increasing very rapidly, there is a tendency to have high interest rates when it has been decreasing very rapidly or increasing slowly, there is a tendency to have low interest rates.

GIBSON PARADOX: PRICES, INTEREST RATES MOVE TOGETHER

Another empirical regularity, which was pointed out many years ago, exists not between money and interest rates but between prices and interest rates. The Gibson paradox is the observed empirical tendency for prices and interest rates to move together. When prices are rising, interest rates tend to be rising; when prices are falling, interest rates tend to be falling.

This was regarded as a paradox because of the orthodox view I have been questioning. Ordinarily, prices would be expected to be rising because the quantity of money is increasing. If the quantity of money is increasing, the orthodox view is that interest rates should be falling. Yet we find that when prices are rising, interest rates are rising, and when prices are falling, interest rates are falling.

ANALYSIS OF CHANGES IN MONEY, INTEREST RATES

That is another piece of empirical evidence which needs to be interpreted by any theory which tries to explain the relationship between the changes in the quantity of money on the one hand and the level or direction of movement in interest rates on the other hand.

Let me turn from this background to a theoretical analysis of the relationship between money and interest rates. This analysis is one which has been developed over the past few years, and in that period three different empirical pieces of work have been done which I am going to summarize for you. To the best of my knowledge, none is yet published.

The first is some work that Anna Schwartz and I have done in studying the relationships between longer term movements in the quantity of money and in interest rates. The second is some work that Philip Cagan has done at the National Bureau on shorter term movements in interest rates within the cycle. Anna's and my work uses as the basic unit a half-cycle, so it has to do with the inter-cycle movement. Phil Cagan’s work has to do with the intra-cycle movement.

The third is a doctoral dissertation just recently completed at the University of Chicago by William Gibson, who is now at the University of California in Los Angeles, which also deals with the shorter period relationships between money and interest rates.

The new work in this area is an interesting phenomenon because it reflects a very long cycle. Irving Fisher worked on this problem back in the '20s and '30s. What the three of us have done is to redo Fisher and find that he was right after all. While there has been considerable work done in these past three years, it owes a great deal to the much earlier work done by Fisher. This is particularly true of the analysis of the Gibson paradox.

ANALYSIS OF CHANGES IN MONEY, INTEREST RATES

I should like to present to you what seems to me now to be the correct theoretical analysis of the relationship between changes in the quantity of money and interest rates. I shall argue that there are three sets of effects which have to be distinguished. The first is the liquidity effect. The second is what I shall call the income effect. The third is the price expectations effect. I shall argue that, of these three effects, the first one works in the direction which has been generally expected, but the second and the third work in the opposite direction. If the effect of monetary change on interest rates is to be understood, all three have to be taken into account.

The liquidity effect in its simplest form is the usual textbook relationship between the quantity of money and the interest rate which says that the larger the quantity of money, the lower the interest rate will have to
be to induce people to hold it. I have drawn it in that form in Figure 1, but no one who is careful writes it in that form and this is one of the slips in the analysis. What really should be measured on the horizontal axis is not $M$, the nominal quantity of money, but $\frac{M}{P}$, the real quantity of money.

Part of the story of tracing the effect of a change in money is going from a change in the nominal quantity of money to what happens to the real quantity of money. For the moment, however, let us waive that. We shall come back to it because it is in the second set of effects—the income effect or income-and-price effect. Let us stay here for the moment with the liquidity effect.

Consider now Figure 2, in which time is measured on the horizontal axis. Let us suppose that up to some moment of time, $t_0$, there has been a constant rate of increase in the quantity of money, say 3% per year. At a certain time it suddenly starts increasing at 5% a year. Let us suppose that interest rates prior to $t_0$ have been 4%, as shown on Figure 2. What should we expect to be the pattern of behavior of interest rates as a result of this one-shot change in monetary growth as it works itself out through time? That is the central theoretical problem.

The first tendency of any economist, in terms of our present literature, is to stress the fact that in order to get people to hold the large quantity of money, interest rates will have to go down. As shown in Figure 1, people were willing to hold $M_0$ at a rate of interest of 4%. To get them to hold more, there will have to be a movement along the curve to lower interest rates. There is an implicit assumption in that analysis that needs to be brought to the surface. The implicit assumption is that prices are not in the first instance affected by the change in the quantity of money.

Let us suppose that prior to this time, prices were stable. Let us suppose for a moment that 3% corresponds to the rate of output increase in the economy and that velocity is constant, just to keep matters simple. None of these assumptions really affects the essence of what I am saying. If, when the quantity of money started increasing at 5% per year instead of 3%, prices suddenly started increasing at 2% per year, you would stay exactly in the same place on the curve in Figure 1 (if the horizontal axis is interpreted as $M/P$), and there would be no tendency for interest rates to go down. The implicit assumption that, in the first instance, the effect is not likely to be on prices, is consistent with much empirical evidence. I should qualify this statement. The implicit assumption seems correct if this jump from 3% to 5% is an unanticipated jump. If it were announced that the jump was going to occur, it would be more plausible that it would have an immediate effect on prices.

**Liquidity Effect: Price of Securities Up, Interest Rate Down**

If this is an unanticipated jump in the rate of monetary increase, it is reasonable to suppose that its first impact will be that people will find the composition of their portfolios disturbed. Holders of cash will find that they have more cash than they planned to have. Their first impulse will be to attempt to readjust the portfolios by replacing cash with other securities. This will bid up the price of other securities and lower the rate of interest. This would be the liquidity effect.

This is the effect which explains why academic economists in general will say offhand that an increase in the quantity of money will lower in-
Interest rates. In economic terminology, we would call this an effect through stocks. The financial economist or Federal Reserve economist will argue a little differently. He would expect an immediate effect through flows. He would say, “How is the rate of increase in the quantity of money stepped up?” He would say that in our kind of financial system ordinarily it will be stepped up by an increased rate of purchase of securities by the central banks, which in turn will add to the reserves of commercial banks which will expand by making additional loans. He would say that the very process of stepping up the quantity of money in our kind of financial system operates to raise the supply of loanable funds. That is entirely true for our kind of financial system.

It is interesting to note that discussions of the problem in earlier literature, for example, in John Stuart Mill’s *Principles of Political Economy*, written over a century ago, very clearly stated that the first-round effect which was to be expected from a change in the quantity of money would be different as it occurred through the credit market or as it occurred through a change in gold production. It was argued that if it occurred through gold production, its first-order effect would be not on interest rates but on the wages of gold miners and the prices of commodities they bought and that it would spread from there. On the other hand, if the increase in the quantity of money occurred through the credit market, its first-round effect would be on interest rates.

These two factors—the effect on stocks and the effect through flows—would work in the same direction. However, the title “liquidity effect” under which I have included both is not an entirely descriptive term. Both factors tend to make for an initial decline in the rate of interest—the stock effect because of a movement along the liquidity curve and the flow effect because of a movement to the right in the supply of loanable funds. There is a difference. The flow effect would produce a decline in the interest rate which might be expected to happen immediately. As long as prices do not react, the effect through stocks will exert a continuing downward pressure on the interest rate. So it is not clear whether the liquidity effect would produce simply a sudden drop to a new level, or a period during which interest rates fall, as I have shown it on Figure 2. That is the first effect—a liquidity effect.

**INCOME-AND-PRICE LEVEL EFFECT**

The next effect is the income-and-price level effect. As cash balances are built up, people’s attempts to acquire other assets raise the prices of assets and drive down the interest rate. That will tend to produce an increase in spending. Along standard income and expenditure lines, it will tend to increase business investment. Alternatively, to look at it more broadly, the prices of sources of services will be raised relative to the prices of the service flows themselves. This leads to an increase in spending on the service flow, and therefore to an increase in current income. In addition, it leads to an increase in spending on producing sources of services in response to the higher price which can now be obtained for them.

The existence and character of this effect does not depend on any doctrinal position about the way in which monetary forces affect the economy. Whether monetary forces are considered as affecting the economy through the interest rate and thence through investment spending or whether, as I believe, reported interest rates are only a few of a large set of rates of interest and the effect of monetary change is exerted much more broadly, in either case the effect of the more rapid rate of monetary growth will tend to be a rise in nominal income.

For the moment, let us hold prices constant and suppose that the rise in nominal income is entirely a result of rising output. What effect will that have? It will raise the demand curve for loanable funds. A business expansion is in process and the increasing level of income will raise the demand for loanable funds. This will exert a force tending to raise interest rates, or at least to counteract the downward pressure from the increasing stock of money. In addition, the rising incomes will tend to shift to the right the liquidity preference curve of Figure 1, since the higher the income, the larger the quantity of money demanded at each interest rate. (Strictly speaking, under our assumptions that the initial position was one of a 3% per year rate of growth in real income, the effect will be a still more rapid shift of the liquidity preference curve. Alternatively, we can interpret Figure 1 as representing a trend-corrected curve.)

Suppose the expansion in income takes the form in part of rising prices. This will not alter the tendency for the demand for loanable funds, expressed in nominal terms, to rise. But, if we measure the real quantity of money \( M/P \) on the horizontal axis of Figure 1, this tendency will affect that figure. Suppose prices go up as rapidly as the increased rate of monetary growth, in our assumed case, 2%. The real quantity of money will remain constant. If prices go up more rapidly than that, you will tend to move back along the curve. As income rises, whether or not prices rise, interest rates will turn around and go up, as a result of the rising demand for loanable funds, the shift of the liquidity preference curve and the possible movement along it.

There are many reasons to believe that this rise in interest rates will go too far. It will overshoot. I cannot cover this point in full here but let me suggest some reasons to expect even this short-run effect to overshoot.

In the first place, we started out by saying that prices will be slow to react and that the initial effect is the disturbance of portfolios. That
means that there is some catching up to do. We can see what is involved most readily by looking at the ultimate long-run position.

If the rate of monetary growth stayed at 5%, the long-run equilibrium position would involve nominal income rising at 2% per year more than it did prior to the increase in the monetary growth rate. In Figure 3, Line C is a continuation of the original trend of rising income, let us say, at 3% a year. Line B shows a trend linked to the initial trend but with a rate of rise of 5%. If at first income proceeds along C but ultimately has to proceed along B, then for some period income will have risen more rapidly in order to catch up. That is one reason for a tendency to overshoot.

![Figure 3.](image)

A second reason is a little more complicated. The true long-run equilibrium position of income will not be Line B but a higher line, say Line A. It will be a higher line because the amount of real balances that people want to hold will be smaller when prices are rising at 2% per year than when they are stable.

**PRICE ANTICIPATION EFFECT**

This brings us to our third effect, the price anticipation effect. When prices are rising at 2% a year and people come to anticipate that they will continue to, this raises the cost of holding cash. Consequently, they will want to hold smaller balances relative to income. This is clearly the case and has been well-documented for hyper-inflation and substantial inflation. Phil Cagan's study on hyper-inflation, which is by now a classic, documents very clearly that in such episodes, the higher the rate of change of prices, the higher is monetary velocity or the lower are real balances.

**DISTINGUISH BETWEEN NOMINAL, REAL RATE OF INTEREST**

As long as there is some tendency for part of the increase in the rate of growth of the quantity of money to end up in a higher rate of price rise, sooner or later people will come to anticipate it. As people come to anticipate it, we introduce a distinction that I have so far kept out of the pic-
t 1 e, namely, the distinction between the nominal rate of interest and the real rate of interest.

We are all very much aware of the distinction right now. It is also a distinction that goes back in our literature, at least to Irving Fisher who analyzed it most exhaustively. If the nominal interest rate is 4% per year and if prices over any period rise at the rate of 2% per year, then the realized real yield will be 2%, not 4%.

However, what matters for the market is not the expected yield which is realized after the event but what people anticipate in advance. People today are buying bonds or other securities or making loans for the long-term future on the basis of what they anticipate will happen.

Let us designate the nominal interest rate by \( R_B \) (the \( B \) for bonds) and the real rate by \( R_E \) (\( E \) for equity). Now \( \frac{1}{P} \frac{dP}{dt} \) is the percentage rate at which prices are changing at time \( t \). Let an asterisk attached to it stand for an anticipated rate, so \( \left( \frac{1}{P} \frac{dP}{dt} \right)^* \) is the anticipated rate of change in prices. Then, the relation Fisher developed is \( R_B = R_E + \left( \frac{1}{P} \frac{dP}{dt} \right)^* \). In other words, the nominal rate of interest on the market will be equal to the real rate of interest plus the anticipated rate of price change. Therefore, if \( R_E \) stays the same but the anticipated rate of price change goes up, the nominal interest rate will also go up. That is the third effect.

Returning to Figure 2, we see that if the whole of this 2% higher rate of monetary growth goes into prices, and if the initial equilibrium interest rate was 4%, then the new long-run equilibrium rate will be 6%. The interest rate pattern then will be something like that shown in Figure 2 and will ultimately get up to 6%.

WHAT THEORETICAL ANALYSIS DETERMINES

That is the whole of the theoretical analysis that leads to tracing out a path of reaction in interest rates. I have exaggerated somewhat what can be traced out from the theoretical analysis alone since the fluctuations I have put in are not well determined. What is really determined by the theoretical analysis is an initial decline, a subsequent rise and an ultimate attainment of a level about 2% higher than the initial one.

Let me give this theoretical analysis some empirical content. How long are these periods? What is their duration? Of the three studies that I have described, the one that Anna and I have done traces out the time pattern at the end, while Cagan's and Gibson's studies trace out the time pattern at the beginning. So far we have a missing link in between. The empirical work all three of us have done is entirely consistent with the pattern traced out in Figure 2. Empirically, there is a tendency for a rapid rate of monetary growth to be followed by a decline in interest rates and, after a lag, by a rise and then a final ultimate movement to a level higher than the starting point. The major patterns are recorded in the empirical evidence and do come out very clearly.

I have been talking about an increase in the rate of monetary expansion. Obviously, everything is reversed for a decrease, and our empirical studies, of course, cover both increases and decreases.

It turns out that the initial decline in interest rates after an acceleration of monetary growth lasts about six months. Clearly, there is variation but the average period is about six months. The time it takes to get back to the initial level is something like 18 months.

LONG PERIOD TO FINAL EQUILIBRIUM LEVEL

The period it takes to get to the final equilibrium level is very long. Fisher came out with a period of something like 20 years. He did a number of different studies which gave him estimates of 20 or 30 years. Our own estimates are about the same. They make a distinction which Fisher's did not. They suggest that the period is different for short rates than it is for long rates. Fisher did his studies for long rates and did not make that distinction.

As a purely theoretical matter, one would expect that it would take longer for long rates than for short rates. When you are buying a security with a short life, you are really interested in extrapolating price movements over a shorter future period of time than when you are buying a very long-term security. It seems not unreasonable that if you are extrapolating for a short period, you will look back for a shorter period than when you are extrapolating for a longer period.

I regard it as very strong empirical confirmation of this interpretation of the evidence that it does turn out that the period it takes to get full adjustment tends to be much longer for long rates than it does for short rates.

In Figure 2, the time it takes to get to the final equilibrium level depends on how long it takes for a change in the rate of monetary change to produce general anticipation of further price rises. That implicitly means that it depends on how far back people look in forming their anticipations. The mean period of price anticipation turns out to be something like 10 years for short rates and 20 years for long rates. Since these are the aver-
age periods, they imply that people take an even longer period of past history into account. These results are wholly consistent with Fisher’s.

One more interesting point—and here I am much more tentative—such evidence as I have seen suggests what is to be expected, namely, that the period it takes is much longer in a country which has experienced mild price movements than in a country which has experienced rapid price movements. In one of the South American countries where prices have moved much more rapidly, the period it takes appears to be much shorter. That is what is to be expected in a more variable world where anticipations would be formed over a briefer period of time.

RELATIONSHIP BETWEEN ANALYSIS AND GIBSON PARADOX

Let me tie this in to the Gibson paradox and show how this analysis is related to that. The explanation that Fisher offered for the Gibson paradox was the same as what I have called the third-effect, but it hinges very much on how long it takes for people to form their anticipations. If price change were perfectly anticipated, if people instantaneously anticipated what was actually going to happen, high interest rates would be associated with rapid rates of price rise, and low interest rates would be associated with low rates of price rise and with price declines, but there would be no reason to expect a connection between rising prices and rising interest rates.

Let me see if I can make this clear. Suppose that the historical record of prices was like that plotted in Figure 4, where the ordinate is the logarithm of the price, so that straight lines correspond to constant rates of price increase or decrease. If people fully anticipated this, the result would be that for periods a and c the interest rate would be high, for periods b and d the interest rate would be low—as shown by the dashed steps. There is no reason why rising prices should be associated with rising interest rates. Rising prices would be associated with high interest rates; falling prices with low interest rates. Yet the Gibson paradox is that rising prices are associated with rising interest rates and falling prices with falling interest rates.

In order to explain the Gibson paradox on this basis, Fisher says that if prices start to rise, people do not really believe it. It takes a long time before they accept the idea that prices are rising. Therefore, if we plot on Figure 4 not what the actual rate of change of prices is but what the anticipated rate of change of prices is, we find that it behaves like the wavy dotted line; the anticipated rate of change of prices starts being low, and only gradually rises, and keeps on rising for a time after actual prices start declining. Only after a lag, will it start to decline and then it will decline only gradually.

So, said Fisher, let prices start to rise when those prices have been stable. As prices rise, people gradually come to anticipate the rise. Only after prices have been rising for a long time will people take full account of the actual rate of rise.

PRICE SAVINGS AND ANTICIPATION TIME

In order for this delayed formation of anticipations to explain Gibson’s paradox empirically, it is clear that there has to be a particular relation between the length of the period that it takes for people to form their anticipations and the actual long swings in prices. If people formed their anticipations very rapidly—much more rapidly than the length of a price rise or fall—then interest rates would rise for only a short period along with prices and soon would be high but constant. When prices started declining, interest rates would be low but constant. They would look more like the steps in Figure 4 than like the wavy dotted line. In order to have a close correlation between rising prices and rising interest rates, there must be a particular relation among the periods. It must be that the period of the long swings in prices is roughly comparable to the period of time which it takes for people to form anticipations.

That is what Fisher found. Indeed, that is the way in which he estimates the period it takes to form anticipation and it is the way we have done it as well.
Fisher’s conclusions as he presented them in the 1920s tended to be disregarded by almost all economists. Very few people paid any attention to him. The explanation is simple. People said, “That’s a silly theory, why should it take people 20 to 30 years to form anticipations about price changes? Surely, a theory which requires such a long period must be wrong.”

What Anna Schwartz and I did was to recalculate the correlations for an additional 40 years or so beyond the period for which Fisher had data. The correlations are just as good for the additional 40 years as they were for the period before. This is a rare event in applied economics. All of us have problems with spurious results. We try a dozen different correlations and finally get one that is satisfactory. How do we know it will hold for the future? It usually does not. But in this case, it so happens that Fisher studied this up through the ‘20s and we have about 40 more years of experience. Nobody since has paid any attention to this particular aspect of the data. Yet they show exactly the same thing for the period since then that they showed before, namely, a high correlation between the rate of change of prices and the rate of change of interest rates. The correlation is higher than the correlation between the level of interest rates and the rate of change of prices. That is to say, it is not the step relation in Figure 4 that dominates but the wavy one.

It is interesting to ask the question, “Why is it that it should take people so long to form anticipations?” I think another feature of the work that Anna and I did gives a very important clue to the answer and has importance beyond this particular problem. You will recall that I mentioned the repeated failure in former work to find a relationship between the rate of price change and velocity in the United States. In the study we made, we found it for the first time. The reason we did, I believe, is that we used as our unit of analysis the half-cycle. Ordinarily, in most such work when we introduce lags we tend to introduce constant chronological lags—one year, two years, three years.

When we started to work on this problem, we found ourselves introducing variable lags without intending to do so because if economic series are averaged over half-cycles, some half-cycles are short, some are long. Consequently, when we related velocity today to price change in a prior cycle phase, we implicitly had a lag that was long when the cycle phases were long and short when the cycle phases were short.

DISTINCTION BETWEEN PSYCHOLOGICAL, CHRONOLOGICAL TIME

What led me to continue along this line was the work that Maurice Allais described in his “A Restatement of the Quantity Theory of Money,” re-cently published in the American Economic Review and in which he made a very basic and important distinction between psychological time and chronological time.

Let me translate this idea without going into Allais’ particular way of putting it—though I believe his paper is one of the most important and original that has been written for a long time, not particularly because of its treatment of the demand for money but for its consideration of the problem of the formation of expectations.

People who are trying to form anticipations have some understanding of the nature of the society. They know that the economy goes in cycles and has its ups and downs. Suppose you are trying to form an anticipation about what is going to happen to prices. You will say, “I had better average out over these cycles. I had better look back to what was happening in a corresponding phase of the last cycle.” If you are examining past history with the idea that there is some kind of cyclical pattern, it is perfectly reasonable for you to go back a roughly fixed number of cycles, not years.

That is exactly what our results suggested. Better results were obtained by taking as a unit of measurement the cycle and not the year. Let us apply this idea to the present problem. Let us say that you are going to buy a 40- or 50-year bond. You want to make a prediction for a long period on the basis of the past. It is reasonable for you to form your anticipation not on the basis of short-period data of the last few years but of a period that will encompass, as it were, full economic episodes.

Because of limitations of time, I am proceeding very dogmatically and sketchily, but this establishes a theoretical reason why it is not surprising to find that the period over which the anticipation is formed bears a relationship to the observed period of long swings in prices.

CORRELATION BETWEEN ANTICIPATION PERIOD, FLUCTUATIONS

You might say that Fisher’s result is a pure coincidence. His result depends on the periods of formation of anticipations being roughly as long as the periods of sustained price movements. Why should they be? If people are intelligently forming anticipations about the future on the basis of an analysis of the past, it is not a foolish thing for them to behave that way. That is why I believe that you will find that this period of anticipation is shorter in those countries which have sharper and more rapid fluctuations than in those which have slower and longer fluctuations.

I was very much struck with this point the other day when I was in New York acting as a representative of many of you at a College Retirement Equity Fund lunch. Some financial people started talking about the difference between the behavior of young people today and of their own be-
behavior with respect to borrowing on credit. These people’s behavior today was being very much influenced by what had happened in the 1930s. This was over a 30-year lag in their behavior.

Now of course the actual lag for the society is an average over all age classes and this is the longest lag, but once you start to look at it in that way, it does not seem to me too surprising that the lag should be so long.

Let me give you another empirical illustration. There is little doubt in my mind that the widespread expectation that prevailed in the United States after World War II that there would be a price fall involved using data going back roughly 150 years.

You ask yourself, “How shall I form an anticipation about what happens after a major war?” There is no use looking at what happened during peace time. It is better to look at what happened after earlier major wars. People who were forming these anticipations after World War II looked back at what happened after World War I, what happened after the Civil War, what happened after the War of 1812, and they found that in each of these cases, within about 10 or 15 years after the end of the war, prices were half what they had been at the end of the war. So it was not at all absurd for people to form their anticipations on the basis of a period stretching back over 100 years.

RECENT EXPERIENCE ILLUSTRATES ANALYSIS

Let me conclude simply by applying this analysis to recent experience because it applies beautifully. When I say this analysis, I really am talking mostly about the short period analysis, not Fisher’s long period analysis. Consider what happened in 1966 and 1967, because it was almost a perfect representation of the relationship I have shown in Figure 2.

There was a rapid rate of growth in money until April 1966. (The exact rate depends on whether you use a narrow or a broad definition of money but nothing I say will be affected by that, because the patterns of behavior of the different rates are the same although the quantitative rates of change are different.) From April 1966 to about December 1966 there was a brief but sharp decline in the rate of monetary change.

From December 1966 or January 1967 through most of 1967, to something like October or November of 1967, there was an even more rapid rate of increase than before April 1966. Since about November 1967, there has been a tapering off in the rate of growth.

DELAYED IMPACT OF EARLIER MONETARY GROWTH

What happened to interest rates during that period? Prior to April 1966 interest rates were rising. Why were they rising? This was the delayed impact of the earlier high rate of monetary growth.

Suddenly there was a tightening of money—a sharp decrease in the rate of growth of the quantity of money. What does our theory say? Turn Figure 2 upside down. It says a rapid increase in interest rates would be expected because the delayed effect of earlier monetary ease is reinforced by the impact effect of monetary tightness. That, of course, is what happened. There was a very sharp rise in interest rates culminating in the so-called credit crunch.

The interesting thing is when did that culminate? In September or October 1966, several months before the reversal in monetary growth. That is exactly what our analysis would lead you to expect—a turnaround about six months after the shift in monetary growth.

At this point the tight money was having a depressing effect on interest rates. The liquidity effect had shot its bolt, the income effect was beginning to take over. That income effect resulted in a slowdown in the economy in the first half of 1967 which reduced the demand for loanable funds and so interest rates fell.

Then what happened? After monetary growth accelerated in January 1967, the short-term effects of easy money reinforced the delayed effect of the tighter money and so interest rates continued to fall. But this time the short-term effect was abnormally short—less than six months. Interest rates turned around some time in March or April that year and started to go up. These delayed effects of easy money were then reinforced in November 1967 by the tapering off of monetary growth.

MANY FACTORS AFFECT INTEREST RATES

Obviously, I am not trying to say for a moment that monetary change is the only thing that affects interest rates. Do not misunderstand me. I am trying to isolate that part of the interest rate movement which is determined by monetary change. Many, many other things affect interest rates.

In particular, I have no reason to doubt that the sharp increase in the federal government’s deficit, which meant an increase in the demand for borrowing by the federal government was a factor which was raising interest rates through most of 1967. It may be that is why there was an
abnormally short delay before the initial impact of easy money was reversed.

I should have made this qualification about other factors earlier. Our squared correlations are perhaps on the order of about .5 which means they account for half of the fluctuations in nominal interest rates. I do not for a moment want to suggest that if you understand the effect of monetary change on interest rates, you therefore have a theory of interest rates. In the first place, there are other forces which will change real interest rates. In the second place, there are undoubtedly other forces changing nominal interest rates, but it so happens that the major movements of nominal interest rates in 1966 and 1967 seem to have been dominated by the monetary effects so they serve to bring out very clearly the relations I have described.

One more word about the longer term relations. If this analysis is right, our present interest rates of 6% or 6½% are still on the way up because they are still reflecting the building up of anticipations of price increases. Our present interest rates are extremely low—if you subtract the rate of price change, you have very low real interest rates. Therefore, if this analysis is right, the long-term trend of interest rates ought still to be up.

---

3/ DAVID I. FAND

Keynesian Monetary Theories, Stabilization Policy, and the Recent Inflation

THE DEMAND FOR MONEY AND LIQUIDITY PREFERENCE: REAL BALANCES AND INTEREST RATES

The quantity theory, in its post-Keynesian reformulation, is a theory of the demand for money and a theory of money income. As a theory of demand it is based on the hypothesis that the demand for real cash balances is highly stable, and that the factors affecting the demand for real balances are independent of those affecting the supply of nominal balances; as a theory of money income it differs from other aggregative income theories in its characterization of the demand function and in the variables that it stresses. 19,20

This reading is excerpted from the *Journal of Money, Credit and Banking*, Vol. 1 (August 1969), and is reprinted with the permission of the author and the publisher. David I. Fand is Professor of Economics at Wayne State University.

19Friedman, in his formulation of the modern quantity theory, points out that the statement concerning the stability of the demand for money needs both elaboration and qualification, as follows: “The quantity theorist must sharply limit, and be prepared to specify explicitly, the variables that it is empirically important to include in the function. For to expand the number of variables regarded as significant is to empty the hypothesis of its empirical content; there is indeed little if any difference between asserting that the demand for money is highly unstable and asserting that it is a perfectly stable function of an indefinitely large number of variables.

The quantity theorist not only regards the demand function for money as stable; he also regards it as playing a vital role in determining variables that he regards as of great importance for the analysis of the economy as a whole, such as the level of money income or of prices. It is this that leads him to put greater emphasis on the demand for money than on, let us say, the demand for pins, even though the latter might be as stable as the former. It is not easy to state this point precisely, and I cannot pretend to have done so.” See Friedman [30, 31], Cagan [14], Meltzer [65], Paasikivi [11], Allais [2] and Johnson [53, pp. 15-103].

20We shall not examine the historical evidence to determine whether quantity