Real Money Balances: A Misleading Indicator of Monetary Actions

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THROUGHOUT most of 1973, many analysts were concerned about the prospects for what they called a "growth recession" – a prolonged period where total output continues to rise, but only at a fairly slow rate. Indeed, the rate of growth of total product in the economy has slowed substantially since early last year. Now these fears have been compounded by reports of widespread difficulty in securing production materials and, more recently, sudden public awareness of the nation's energy problem. The situation has shifted to one of fear of an imminent decline in economic activity. While a great deal of attention is directed toward the prospects for production and employment, much concern is also being expressed about the accelerated rise in prices in 1973. There is some fear that actions to stimulate production might further aggravate the inflation problem.

Recently, however, some analysts have claimed that monetary actions threaten to restrict the expansion of aggregate demand to an extent which would aggravate any impending production and employment problems. In part, this point of view is based on the observation that the accelerated pace of inflation last year exceeded the growth in the money stock, resulting in a decline in "real money balances" – money divided by an index of prices.[1]

The argument is apparently based on the contention that the effect of changes in the money stock on economic activity is transmitted through the public's demand for these "real money balances". The conclusion is reached that, since the accelerated rate of inflation last year has contributed to a reduction in these real money balances, individuals have been restricting their spending, and will continue to do so in an attempt to rebuild the amount of "real" money they hold. Some have suggested that this view implies that monetary policy should be directed toward increasing the rate of growth of the money stock above that of the rate of inflation, thus restoring real money balances to their former level.

In this context, the ratio of the money stock to some current price index is alleged to be an *indicator* of the thrust of monetary policy. As an indicator, the decline in this ratio in 1973 has been offered by some observers as evidence that monetary actions in 1973 were restrictive and, unless real balances are restored by accelerated money growth, will lead to a reduction in output and employment. This article shows that such an interpretation of this ratio is misleading, at best, in that a decline in real balances can be indicative of either monetary restraint or stimulus. It is also shown that attempts to control the stock of real balances are extremely dangerous. The effort has been made in other countries on other occasions, and in many instances, has led to an ever accelerating rate of inflation and eventual economic collapse.

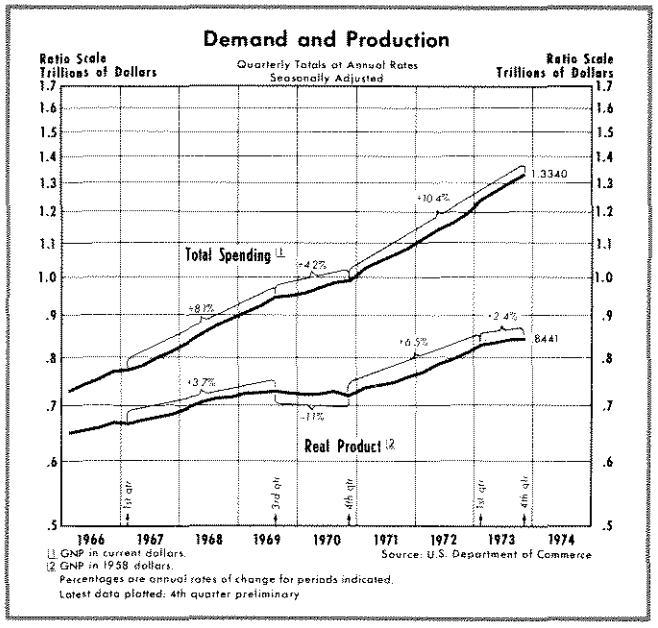
REVIEW OF ECONOMIC SITUATION

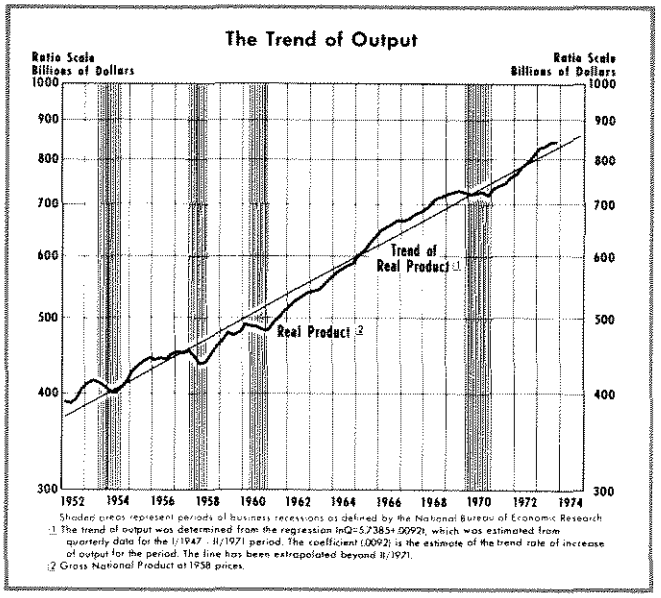
Aggregate demand has increased steadily over the past three years. Total spending in the economy rose 11.2 percent over the year ended in the fourth quarter of 1973, compared to a 10 percent annual rate of increase experienced in the previous two years. Over most of the period since 1970, rapid expansion of aggregate demand served to induce growth in production from the depressed level of the 1969-70 recession. It now appears, however, that the economy is close to its short-term potential rate of production, with rapid expansion of demand eliciting smaller gains in output.[2]

[1]An ironic development is that this argument is being advanced by economists who hold vastly different views on the role of monetary actions in economic activity. For example, First National City Bank of New York, which has usually been identified with the monetarist position that monetary actions are a dominant force in the economy, has taken this position. See "Energy: looking past the panic at the problem," *Monthly Economic Letter,* First National City Bank of New York (December 1973), pp. 6-7. At the same time, Professor Walter Heller, who has little sympathy for monetarist precepts, has offered a similar analysis. See, for example, his column, "Oil and the 1974 Economic Outlook," *Wall Street Journal,* 8 January 1974.

On January 31, 1974, the Board of Governors of the Federal Reserve System released a revised series for the money stock. The revision was based on a benchmark adjustment for nonmember banks and revised seasonal adjustment factors. The revised data show a faster rate of money growth in the first half of 1973 than did the original data. As a consequence, the level of real money balances did not decline as much as had been thought earlier.

[2]One element in the growth of aggregate demand last year was a shift in the composition of demand. For example, consumer preference has shifted toward smaller automobiles, reflecting public doubt about future gasoline prices and availability. The decline in spending for autos reflects, in part,





The rate of increase in production over the 1971-72 period exceeded the estimated rate of growth of the economy's productive capacity – the combination of such factors as increases in productivity, technology, labor force, and productive facilities. Thus the rapid expansion of demand served to induce more intensive use of productive resources, encouraging new employment while allowing resources idled during the 1969-70 recession to be re-employed. One aspect of this expansion was reflected in the reported rate of unemployment, which declined from 6 percent of the civilian labor force in 1971 to an average of 4.7 percent in the fourth quarter of last year.[3]

Total production in the economy increased at a 1.3 percent annual rate in the fourth quarter of last year, according to preliminary estimates. The rate of output growth began to slow early last year and production increased at only a 2.4 percent rate from the first to the fourth quarters in 1973. This is markedly slower than the rate achieved over the prior two years, when the average rate of increase of total production was in excess of 6 percent.

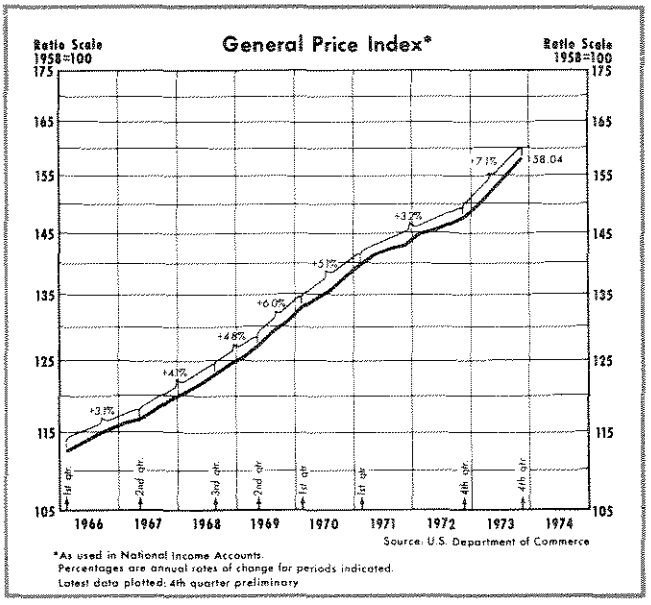
As output growth slowed last year in the face of steadily rising aggregate demand, the result was a renewed acceleration in the rate of inflation.[4] The average level of prices in the economy, as measured by the deflator for gross national product, rose at a 7.9 percent annual rate in the fourth quarter and was 7.1 percent higher than a year earlier. The rate of increase in prices during 1973 was more than double the average 3.5 percent rate of increase reported over the previous two years.

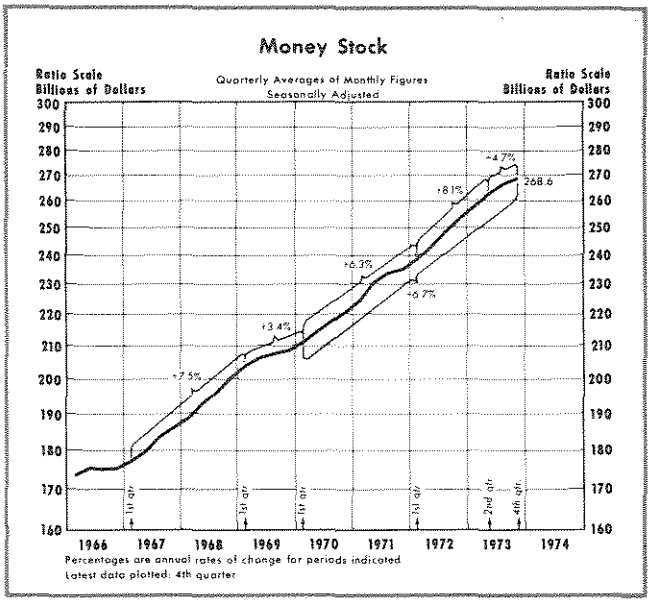
The general situation at the end of 1973 was that output growth had slowed considerably and inflation had accelerated anew. These are not two separate problems, however. They are the joint result of the rapid expansion of aggregate demand since 1970. Sharp increases in aggregate demand throughout the 1971-73 period strained the ability of the productive sector to keep pace. The imposition of price-wage controls and the numerous shifts in control policy served to further constrain the ability of the economy to expand production to meet growing demands. The recent embargo on oil shipments from the Middle-

a decrease in demand for new cars. An additional factor has been the inability of auto manufacturers to shift production quickly from standard size cars to smaller cars. Inventory stocks of large cars have increased substantially, while stocks of smaller cars have been drawn down. The result has been a sharp decline in production of automobiles and increased unemployment in the industry. In this type of situation it is difficult to determine how much of the decline in production is due to an absolute *decline* in consumer demand for cars and how much is due to the inability to shift production to meet a *shift* in consumer demand.

[3]The rate of unemployment rose to 5.2 percent of the labor force in January 1974, reflecting cutbacks in employment in automobile production, transportation, and service industries which rely heavily on travel volume. It is too early to attribute such a rise in unemployment to a general weakening of economic activity, however, since much of the rise reflects the shift in consumer preference away from energy-using activities.

[4]While rapid expansion of aggregate demand served as the catalyst for increases in the *average* level of prices last year, several developments worked to intensify pressure on specific prices in the economy. These developments, including increased foreign demand for U.S. farm products, worked to intensify changes in *relative* prices in the economy. There is no doubt, for example, that the huge purchase of grain by the Soviet Union last year contributed to the rise in food prices; but such a transaction, unless accommodated by monetary expansion, does not necessarily raise the *average* level of prices in the economy.





East was but one more element limiting the short-term productive capacity of the economy.

THE ROLE OF MONEY AND REAL BALANCES

The amount of money that individuals and businesses want to hold is a result of a decision about the form in which wealth is held. Various types of assets – money, bonds, equities, savings deposits, real assets, and so forth – serve as a store of value, a means of holding purchasing power.[5] They do not perform this service equally well, however. In some situations real assets serve better as a store of value than do monetary assets, such as bonds and money. In other situations, it is relatively more advantageous to hold monetary assets.[6] The proportion of wealth held in these various assets reflects the attempt by individuals to command maximum purchasing power, weighing such factors as relative risk of default, expected changes in *relative* prices, and expectations about the average *level* of prices.

Besides serving as a store of value, money holdings provide a convenience in that they are readily accepted in exchange for goods and services. Even in periods when other assets serve better than money in protecting purchasing power, money balances are still desired as a means for reducing the cost of transactions.

Individual and Aggregate Demand for Money

The demand for money, as both a store of value and a means for facilitating transactions, is tempered by the advantages which accrue to holders of other forms of assets.[7] By holding money balances, an individual sacrifices the services of other assets. Other financial assets, for example, yield an explicit interest income, which money balances do not. The higher the rate of interest, the greater is the interest income sacrificed by holding money. In addition, if prices of goods and services are expected to rise in the future, this interest income helps to offset some of the decline in the purchasing power of monetary assets. Rising

[5]For a concise, but fairly complete, presentation of the elements which enter into the demand for money, see Milton Friedman, "The Quantity Theory of Money – a Restatement," *Studies in the Quantity Theory of Money*, ed. Milton Friedman (Chicago: University of Chicago Press, 1956), pp. 4-15.

[6]Monetary assets are more reliable as a store of value than real assets during periods of unexpected changes in the relative prices of real assets. Consider, for example, the case in late 1973 when the price of many equities fell and the price of petroleum rose. Wealth held in the form of equities declined while wealth held in the form of crude oil stocks rose. Ignoring all other forms in which they each held their wealth, equity holders suffered a wealth loss and oil holders enjoyed a wealth gain. Holders of money balances did not enjoy the wealth increase which accrued to oil holders, but neither did they suffer the loss absorbed by holders of equities. Thus money served as a hedge against such relative price movements. If the choice was between holding money or oil, oil was obviously a better store of value, and if the increase in the price of oil had been foreseen by an individual, the result would have been an increase in his demand for a real asset (oil) relative to his demand for a monetary asset (money). For a review of the effects of commodity inflation on various forms of wealth see Albert E. Burger, "The Effects of Inflation (1960-68)," this *Review* (November 1969), pp. 25-36.

[7]The demand for money *to hold* must not be confused with the desire to borrow funds *to spend*. The former refers to the average level of money balances that individuals and businesses want to hold over some period of time. The demand to borrow is the demand for credit, where the price of borrowed funds is reflected in the rate of interest.

interest rates would tend to decrease the quantity of money balances an individual desires to hold relative to other financial assets.

One individual in the economy has very little influence on average prices and interest rates. Being only one among many in most markets, an individual essentially buys and sells at quoted prices. An individual's desire to hold various assets, including money, reflects attempts to adjust asset holdings to the prices currently prevailing as well as those expected in the future.

What is true for an individual, however, is generally not true for the economy as a whole. While an individual is able to dispose of what he considers to be excess money balances, such decisions do not substantially change total money in the economy. The amount of money in the economy is effectively determined by the actions of the monetary authorities, and one individual's reduction in money balances creates excess balances in someone else's portfolio.[8] The second person, in turn, attempts to exchange these balances for other assets, and so on through the economy.

While each individual is adjusting money balances to prices and interest rates, the cumulative effect of many persons attempting the same adjustment is pressures on prices and interest rates. The pressure for price change will continue until individuals find that the cost of exchanging money for other assets exceeds the expected return at the new set of prices and interest rates. Thus individuals adjust money holdings to prices, but for the economy, prices adjust to the amount of money.

The ultimate effect of increases in the stock of money is a higher level of prices in the economy.[9] The relationship between the money stock and the price level is quite close over extended periods; that is, the trend rate of inflation is determined primarily by the trend rate of money growth in the economy. This effect is transmitted via the public's demand for money balances, resulting in changes in aggregate demand for goods and services. The price which adjusts is the average level of prices. Not all prices are affected equally and some change more than others.[10]

Real Balances as an Indicator

The role of "indicators" in the formulation of stabilization policy stems from the lack of complete information about the economy. Policymakers do not know with certainty the effect that their actions will have on production, employment, and prices. They require some readily available and reliable information about the effect of their policy actions.[11]

For an individual, a rise in the ratio of money to prices can occur in two ways. First, his money balances may suddenly rise faster than prices. For example, he might receive a wage increase, resulting in a larger paycheck. Secondly, the rate of change of prices may unexpectedly rise slower than the rate at which his money balances are growing. In either case, his ratio of money to the price of other assets rises and he attempts to adjust his portfolio.

We cannot generalize from individual behavior, however, and say that when the ratio of money to some price index in the economy rises, monetary policy is stimulating economic activity, or when this measure of real balances is falling, monetary policy is restrictive. The problem with using the ratio of money to an index of commodity prices, or financial asset prices for that matter, is that this ratio is deter-

[8]This is not to say that the monetary authorities can necessarily control the stock of money exactly on a daily, weekly, or even monthly basis. Over the course of a quarter, however, changes in the stock of money are closely related to monetary policy actions.

[9]This proposition has a long tradition in economic literature. An informative comparison of money and price movements over the past twenty years can be found in James M. O'Brien, "Inflation and a Role for Monetary Policy," *Business Review*, Federal Reserve Bank of Philadelphia (December 1973), pp. 3-11.

[10]Due to the diversity of tastes and preferences among economic units, an increase in aggregate demand is not manifested equally across all markets. In addition, differences in technology, expectations, and resource endowments in the various markets result in different supply responses. The combination of these factors results in larger increases in demand in some markets than in others and also larger increases in some prices than in others. In a smoothly functioning market economy resources move between markets in response to information about these changes in relative prices.

The movement of resources in response to the stimulus of price change is constrained by several non-economic factors, among which are legal institutions. The wage and price control program instituted in 1971, and pursued with varying intensity since, is one such legal constraint. The effect of these controls has been to distort the functioning of the price system as an allocative device. Markets where prices are controlled are unable to attract new resources to meet demand increases, and persistent "shortages" develop. In non-controlled markets, prices are bid higher in the short run than they otherwise would be, as demand, unsatisfied in controlled markets, shifts to markets where prices are not controlled by government edict. The controls result in changes in relative prices, but the average level of prices rises just the same. The speed of adjustment of average prices, however, might be altered.

[11]An indicator serves a purpose much like that of a thermometer which provides signals as to when more output is needed from a furnace in order to maintain some desired room temperature. For a discussion of the indicator problem in monetary policy, see Albert E. Burger, "The Implementation Problem of Monetary Policy," this *Review* (March 1971), pp. 20-30.

mined by the public and is ultimately beyond the control of the monetary authorities. *In the long run the ratio is essentially whatever the public wants it to be; monetary actions have only a temporary effect on real balances.*

The ambiguity of real money balances as an indicator can be seen most readily by considering a case where there are no adjustment costs in the economy. If economic units could fully and instantaneously adjust their portfolios to excess money holdings, prices and interest rates would change immediately to equate the aggregate amount of money demanded to the larger amount supplied. Commodity prices would rise instantly to the point where it is no longer advantageous to exchange money for goods and services. In such a world, measures of real money balances, money divided by an index of commodity prices, would always be equal to the amount of real money balances demanded in the economy. A fall in real balances would mean that the amount of money demanded relative to the commodity price level had declined and that aggregate demand for goods and services had been stimulated.

However, prices do not adjust instantaneously, and observed movements in the ratio of money to commodity prices can also reflect the temporary effect of the adjustment process. Individuals hold a wide variety of expectations, and are bound by a variety of contractual agreements. It takes time for the adjustment of prices to take place, and the observed ratio of money to prices cannot, by itself, reveal anything about the state of that adjustment. Since prices do not fully adjust immediately (nor do people's expectations about future prices), an increase in the stock of money, above that demanded by the public, results in a temporary increase in the ratio of money holdings to commodity prices.

Empirical evidence suggests that, on average, output is much more responsive in the short run to unexpected changes in aggregate demand than is the average level of prices. The initial effect of a change in aggregate demand stemming from the excess supply of money balances will tend to be manifested in attempts to increase output to meet the new demand. Thus the rise in "real balances" will tend to be associated with a temporary rise in output. As the rate of resource utilization rises, however, these increases in output become increasingly more costly to maintain. When businesses begin to suspect the increase in demand to be longlasting, they will cease attempts to meet it solely by increased utilization of labor and capital and begin to increase price, in line with their

HOW REAL BALAN

The level of "real money balances" depends on three factors. The ultimate determinant is the amount of real balances that the public wants to hold, as determined by the public's comparison of the relative subjective value of the services of money and nonmoney assets and their respective prices. If economic activity adjusted instantaneously to all shocks, the public's demand would be the sole determinant and "real balances" would always be as desired by the public. Since adjustments in economic activity typically take time, there are two additional factors which do affect the level of real money balances. These are changes in the amount of money resulting from actions of monetary authorities, and the mechanism by which the public adjusts to discrepancies between the amount of money they actually hold and the amount they want to hold at current prices. The example below is intended to illustrate the interaction of these three factors in determining the level of "real money balances."[1]

The model used to generate these results assumes that the public is willing to hold a one percent larger stock of money only if prices rise by one percent. In other words, the quantity of money demanded is proportionate to the price level.[2] It is also assumed that there are costs of adjustment in the economy which prevent instantaneous adjustment to changes in the amount of money outstanding. Specifically, when individuals decide that at current prices their money balances are larger than they desire and thus attempt to exchange money for other assets, the price level does not *begin* to adjust to this increased spending until the next period. In addition, the price adjustment in that period is only half of what is required to induce the public to hold the larger stock of money.

In the example the money stock is increased by 10 units in the first period, from 100 to 110. This change follows an extended period where prices were constant (at an index of 100) and the amount of money demanded at those prices was also 100 units. Thus in the first period the amount of money in the economy (110) exceeds the amount demanded (100) by ten units, and the demand for other assets is stimulated. Prices are unaffected in the first period, however, resulting in a rise in real money balances from 1.00 to 1.10. If the money stock then remained at 110 units, prices would have to rise from 100 to 110 before the

[1]The example is not intended as a model of actual behavior in the economy. It is an expository device which can be helpful in understanding the issue – in particular, the misleading information which can be obtained from using real money balances as an indicator of the effect of monetary actions.

[2]For the sake of simplicity only the current prices of goods and services are considered in the demand for money. Interest rates, other prices, and price expectations are ignored. This omission does not affect the analysis.

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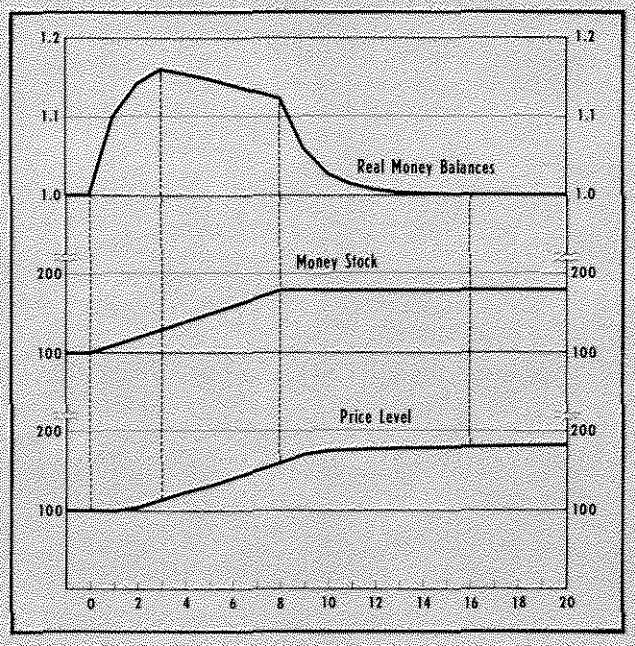


public would be willing to hold the larger money stock. Due to the adjustment process, prices rise to 105 in the second period in response to the increased demand for goods and services. At this price level the amount of money that the public wants to hold increases to 105 units. In the second period the money stock is increased another 10 units to 120. The amount supplied now exceeds the amount demanded by 15 units, and the demand for goods and services is further stimulated. Real money balances also rise again to 1.143, (120 ÷ 105).

The money stock continues to be increased by 10 units in each period until the ninth period when it ceases to rise and is held constant at 180 units. Real balances begin to fall in the fourth period, however, while the money stock is still increasing. The fall reflects the accelerated rate of price increase resulting from *prior* increases in the money stock. In the third period the money stock is 130 units and the price level is 112.5. Thus the amount of money supplied exceeds the amount demanded by 17.5 units, and the pressure on prices is to increase by 8.75 units in the next (fourth) period. This represents an increase of 7.78 percent over the price level in the third period, but the money stock increases by an additional 10 units in the fourth period, a 7.69 percent increase. Since the rate of price increase exceeds the rate of increase in the money stock, the level of real money balances declines. Although the money stock continues to increase by 10 units in each of the next four periods, the rate of price rise exceeds the rate of money growth in each period. As a result, the level of real balances falls. *The accelerated rate of price increase reflects prior monetary stimulus, and real money balances begin to fall while monetary actions are still stimulating demand for goods and services.*

When the monetary authorities cease to provide additional stimulus after the eighth period and hold the money stock constant at 180, the stimulative effect of their previous actions continues. Prices continue to rise since the amount of money in the economy in the eighth period (180 units) exceeds the amount demanded (160.1 units). Due to the adjustment procedure assumed in the model, it takes another eight periods before prices rise sufficiently to induce an increase in the amount of money demanded from 160.1 units to 180 units.[3] With the money stock constant, the rise in prices further decreases "real balances," which ultimately return to 1.0, the ratio desired by the public.

Looking just at the pattern of real balances above, they are seen to rise sharply for three periods after being constant for some time. Real balances begin to fall in the fourth period and then decrease at a faster pace from the ninth period onward, returning to their original level in about the sixteenth period. It would be incorrect to conclude, however, that on the basis of the movement of real balances, aggregate demand was stimulated in the first three periods, restricted somewhat over the next five periods, and then restricted even further. This pattern of "real money balances" was generated by monetary actions which stimulated aggregate demand over the *entire* interval from the first to the sixteenth periods. The decline in real money balances from the fourth period onward reflects only the adjustment in prices to excessive money holdings and does not necessarily indicate a fall of real balances below the desired level.

An attempt by the monetary authorities to maintain the ratio at any level above 1.0 by increasing the money stock results in a perpetual increase in the level of prices. For example, if the monetary authorities attempt to keep the ratio at 1.10, the level reached in the first period of the example, prices would rise 5 percent in every period thereafter. The inflation which results from attempts to maintain real money balances above the level desired by the public would be even greater if the monetary authorities tried to maintain an even higher ratio. Prices would rise 10 percent per period if the monetary authorities sought to hold the ratio at 1.20.[4]

[3]Since prices adjust in each period by half of what is required to restore equilibrium, the price level will only approach a level of 180. After the sixteenth period, however, the price level is very close to 180 and the difference becomes insignificant thereafter.

[4]The rate of inflation is also dependent on the speed of adjustment of prices; the faster the adjustment, the more rapid the inflation. For example, if the rate of price adjustment was 75 percent instead of 50 percent, attempts to hold the ratio at 1.10 would result in a 7.5 percent rate of inflation. Attempts to hold the ratio at 1.20 would result in a 14 percent rate of price rise.

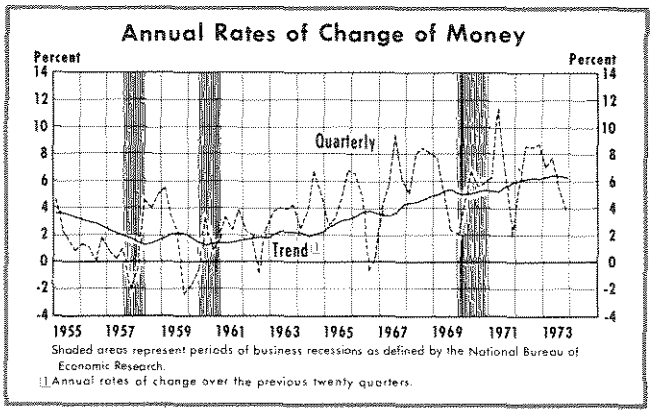
longer-term profit plans.[12] As prices rise, "real balances" fall toward their former level. This fall, instead of being indicative of monetary restriction, is actually the result of prior monetary *stimulus*. Prices will continue to rise, and real money balances fall, until the advantages gained by exchanging money for other assets become too expensive, and people are willing to hold the increased stock of money.[13]

Real Money Balances in the Current Economy

The rate of money growth averaged a little over 6 percent from the fourth quarter of 1972 to the fourth quarter of 1973, not much different from the average rate of increase experienced over the previous five years. As stated earlier, empirical evidence suggests that the rate of average price change in the economy is determined by the trend rate of money growth over the prior 4 to 6 years.[14] On the basis of this evidence, the rate of monetary expansion would have to fall significantly below this trend rate before a "shortage" of money developed at current prices and interest rates, and aggregate demand was restricted sufficiently to contribute to a decline in output and employment.

The chart entitled "Annual Rates of Change of Money" shows the quarter-to-quarter annual rate of change of the money stock and the trend rate of money growth, measured by a twenty-quarter moving average of the rate of money growth. Twenty quarters is selected as the period over which prices adjust to equate the supply and demand for money balances.[15]

The chart "Real Money Balances" shows that there are five periods from 1955 to 1973 when the ratio of money to commodity prices declined for two quarters



or more: 1955-57, 1959-60, 1966, 1969, and 1973. Prior to 1973, each period in which "real balances" declined for two quarters or more was followed by a significant slowdown in economic activity, ranging from the 1966-67 mini-recession to full-scale recessions in the other periods.

It can be seen from the "Rates of Change of Money" chart that in 1955-57, 1959-60, 1966, and 1969 a large portion of the decline in real balances reflected a sharp drop in the rate of growth of the money stock below its trend. The deceleration in money growth in 1973 was not as abrupt. Instead, the indicated decline in "real balances" in 1973 reflected, in large part, the reported acceleration of inflation.

Since the adjustment of prices to a change in the trend rate of money growth is estimated to take from four to six years to complete, it is probable that the economy is still adjusting to the accelerated rate of money growth over the period from 1971 to mid-1973.[16] Supporting evidence for this contention can be found in the movement of interest rates in 1973.

An important element in the adjustment of prices to an increased trend rate of money growth is the adjustment of price expectations – a component of long-term interest rates. The rate of interest on Aaa-rated corporate bonds averaged 7.82 percent in January of this year, compared to 7.15 percent a year earlier. If people currently expected inflation to average 7 percent over the next 10 to 20 years (the actual rate of increase in 1973) then the current real rate of interest on high grade bonds would be substantially less than one percent, and would have declined substantially since 1972, when the expected rate of infla-

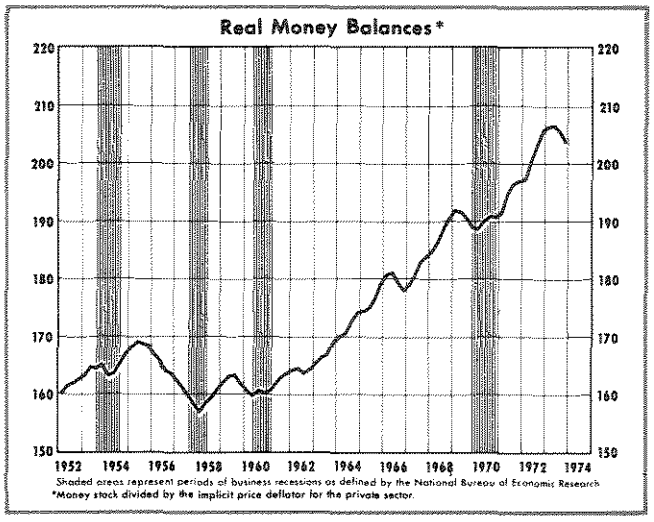
[12]Denis S. Karnosky, "The Effect of Market Expectations on Employment, Wages, and Prices," Federal Reserve Bank of St. Louis, Working Paper No. 17 (August 1973), pp. 22-33.

[13]As prices rise the *amount* of money demanded increases until the public is willing to hold the larger stock of money. This is a movement *along* a demand curve to restore an equilibrium. This is not to be confused with an increase in the demand for money, a shift to the right of the demand schedule. In the latter case the public decides it wants to hold more money balances at all prices. Such a shift would result in the public decreasing its demand for other assets in an attempt to increase its money balances. The effect is a restriction of aggregate demand. In the former case, aggregate demand is stimulated.

[14]See Leonall C. Andersen and Denis S. Karnosky, "The Appropriate Time Frame for Controlling Monetary Aggregates: The St. Louis Evidence," *Controlling Monetary Aggregates II: The Implementation*, Conference Series No. 9, Federal Reserve Bank of Boston, 1972, pp. 147-77.

[15]Ibid., pp. 147-77. This selection is not completely arbitrary, but is the mid-point of the range suggested by empirical investigations.

[16]It can be seen from the "Annual Rates of Change of Money" chart that the trend rate of money growth has increased, on balance, since the mid-1960s. The trend rate reached 6 percent in late 1971 and has changed little since. The money stock would have to grow at an average of 6 percent for another couple of years to firmly establish a new trend and allow prices to adjust completely.



tion was presumably much less than 7 percent. This seems highly improbable.

It is more likely that, while the sharp acceleration in the rate of commodity inflation in 1973 was not expected by most people, average expectations of the long-term rate of inflation were not revised upward to the full extent of the 1973 inflation.[17] The longer the rate of inflation remains at 7 percent, however, the more the expectations of inflation would be revised upward. An increase in the expected rate of inflation would tend to *decrease* the amount of money demanded, in any event, as real assets and non-money assets become more attractive relative to money as stores of purchasing power. The change in expectations would then put further upward pressure on prices.

The inflation of last year, instead of threatening to restrict aggregate demand by eroding real money balances below desired levels, reflects the efforts of the public to dispose of excess money balances. On the basis of past experience, if the money stock continued to grow at about the 6 percent annual rate observed in 1973, this adjustment would continue for another year or two.

The arguments which contend that monetary policy is restrictive, on the basis of the recent decline in "real money balances," imply a recommendation to increase the rate of money growth *above* the rate of inflation in order to restore the growth of real balances. Both theoretical analysis and the experience of other countries indicate that there are few more dangerous courses of action that any monetary authority could undertake.

The stock of money is determined by the monetary authorities, but the stock of "real balances" is essentially determined by the behavior of the public. In order to achieve some level of "real balances" the monetary authorities would have to be able to control the price level, independently of the stock of money outstanding. Monetary authorities do not have that power. The stock of money and the rate of price change are intimately related, in that any attempt to force the public to hold larger money balances than they desire ultimately results in accelerating inflation.

A further increase in the rate of money growth, above its recent average rate of 6 percent per annum, would only generate pressure for further inflation. It is not possible to avoid the adjustment of real money balances to the level desired by the public by *increasing* the rate of money growth.[18]

SUMMARY

The slowdown in the growth of output in the economy since early last year reflects, in large part, the constraints on production stemming from a generally high level of resource utilization and the perverse effects of price control programs. Severe limitation of growth in energy supplies would work to further this constriction of output potential for at least a short time. Aggregate demand continues to grow rapidly, however, and inflationary pressure is strong.

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[17]There is some evidence that short-term price expectations are not of the magnitude of 1973 rate of inflation. In one survey taken in November of last year, the consensus was that the implicit price deflator for GNP would rise at a 5.1 percent annual rate from the fourth quarter of 1973 to the fourth quarter of 1974. See J.A. Livingston, "Prospects for 1974? The Economists Can't Agree," *The Philadelphia Inquirer*, 30 December 1973.

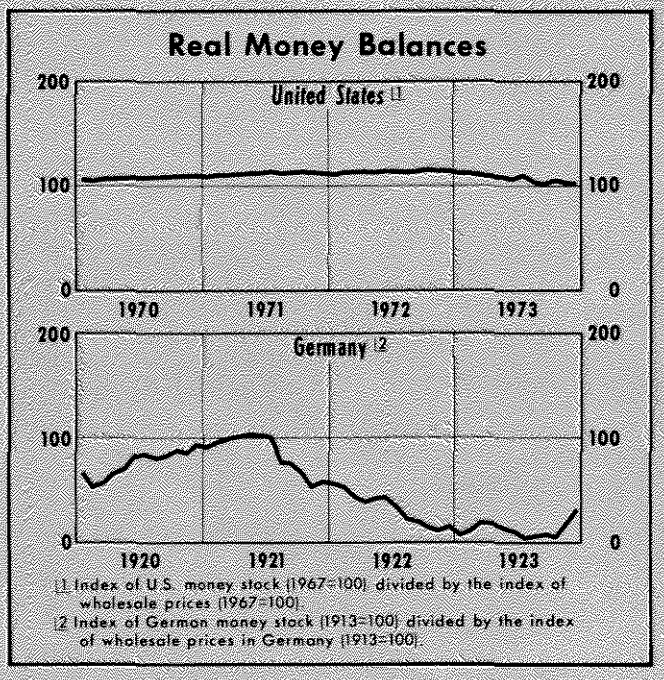
There is also a strong possibility that current price indices overstated the *acceleration* of inflation in 1973. While there can be no doubt that many prices rose dramatically last year, food prices for example, the aggregate indices are not sufficiently flexible to capture the effects of *shifts* in demand. Given the perverse effect of price controls, the actual rate of increase of commodity prices, on average, was probably somewhat higher than reported in 1971-72 and somewhat lower in 1973. As measured by the GNP deflator, prices rose at an average annual rate of 4.7 percent over the three years ended in the fourth quarter of 1973. The actual rate of inflation was probably a bit below this in 1971 and somewhat above in 1973. This is difficult to document, but it is consistent with the types of price forecasts being made by various observers.

[18]As an extreme example of the futility of such a policy, during the German hyper-inflation of 1920-23, the monetary authorities interpreted the long lines of persons waiting for bank notes as indicative of a currency shortage. In order to meet the cash requirements at the existing prices they sought to increase the supply of money faster than prices were rising. The approach was to print ever larger denominations of currency and speed the output rate of their printing presses. See Frank D. Graham, *Exchange, Prices, and Production in Hyper-Inflation: Germany 1920-23* (New York: Russell & Russell, 1930), pp. 104-7.

REAL BALANCES DURING GERMANY'S HYPER-INFLATION

The inflationary experiences of Germany, Hungary, Austria, and other countries after World War I provide extreme examples of how misleading "real balances" can be as an indicator of monetary policy. Take the example of Germany in the early 1920s. The accompanying chart shows movements in "real money balances" for Germany in the early 1920s. The U.S. experience provides a perspective for the enormity of the German problem. From the chart it is obvious that the recent decline in real balances in the United States is almost imperceptible when compared to the decline experienced in Germany from 1921 to late 1923.

The German hyper-inflation began with a wartime deficit financed largely by the printing press. The money stock kept rising after the war ended, as the German government attempted to meet the heavy reparations demanded by the allies. From June 1922 to November 1923, the German money stock rose by almost 2 trillion (2,000,000,000,000) percent.[1] No one could possibly call this a restrictive monetary policy. Nevertheless, over the same period "real money balances" fell each month at an average annual rate of over 50 percent. The reason these real balances fell is that as expectations of inflation rose to catch up with the phenomenal increase in prices, over 10 trillion percent from June 1922 to November 1923, the cost of holding wealth in the form of currency and demand deposits became prohibitive; the demand to hold money balances essentially fell to zero.



[1]See Frank D. Graham, *Exchange, Prices and Production in Hyper-Inflation: Germany 1920-23* (New York, Russell & Russell, 1930), pp. 104-7.

The danger in using "real money balances" as an indicator of the thrust of monetary actions in the current situation is that these balances can give very misleading information. Movements in real balances reflect the adjustment of public behavior to discrepancies between desired and actual money balances. The monetary authorities, although able to control the growth of money in the economy, are not able to secure lasting changes in real balances which are inconsistent with public demand. Ultimately, prices will adjust to frustrate any such efforts. As prices adjust upward the stock of "real money balances" will tend to decline. This fall, instead of being indicative of monetary restraint, reflects prior monetary stimulus.

Temporary changes in real balances, above levels desired by the public, can be achieved, since the public does not immediately adjust their expectations or their behavior, and price increases will tend to lag behind. The historical record of Germany, Austria, Hungary, the American Confederacy, and many other economies is frightening evidence of the futility of trying to increase money faster than prices are rising. All of these economies experienced declining "real balances" while their respective money stocks were increasing explosively.

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