

# FEDERAL RESERVE BANK OF ST. LOUIS

FEBRUARY 1975



# REVIEW



## CONTENTS

Inflation: Its Cause and Cure .....	2
Operations of the Federal Reserve Bank of St. Louis — 1974 .....	8
Financing Government Through Monetary Expansion and Inflation .....	15

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# Inflation: Its Cause and Cure

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**W**E ARE today experiencing the most prolonged period of rapid inflation in the history of the United States. While we have had short periods where inflation rates have been more intense, a decade of high inflation rates is without precedent in the history of the Republic. As an index of how severe price increases have been for the last decade, the consumer price index, which measures the price of a market basket of goods and services purchased by the American consumer, is up 66 percent; the wholesale price index, which measures the price of raw materials used in the production process, is up 75 percent from a decade ago. Not only have we experienced a decade of high inflation rates, but in the last year the rate of price increase has quickened. The consumer price index is up 12 percent from a year ago and the wholesale price index is up 20 percent. These harsh economic facts suggest two questions: (1) how did we get in such a mess, and (2) how do we get out?

The first question is easy to answer. There are data on inflation which go back to the 15th century, when gold was discovered in America, transported to Spain, and permeated the European market. Since that time there has *never* been a prolonged general price inflation that was not preceded by and directly related to a growth in the money supply. In our economy, growth in the money supply occurs principally when the Government spends more than it taxes and prints money to make up part of the deficit.

## *The History of U.S. Inflation*

We have incurred five major inflations in the history of the United States: the Revolutionary War inflation, the War of 1812 inflation, the Civil War inflation, the World War II inflation, and the Vietnam War

inflation. All five of these inflations have had the same cause — a rapid increase in the money supply. Under the Articles of Confederation, the Continental Congress did not have the power to tax. It was therefore forced to issue paper currency to fight the Revolutionary War. The paper currency units were called Continental Dollars. You have all heard the saying “not worth a Continental,” a statement derived from the fact that when Continental Dollars were redeemed at the end of the Revolutionary War, they were redeemed at 2 cents on the dollar in gold and silver. The paper currency depreciated very rapidly because of the tremendous quantity which was issued. In essence, the Continental Congress was entering the American market and competing against private citizens for goods and services with newly issued Continental currency, buying goods at a more rapid rate than the economy was producing them. Prices, therefore, were driven up.

In reviewing our first inflationary experience as a nation, it is important to note that at the end of the Revolutionary War the Congress established the First Bank of the United States, which systematically withdrew Continental Notes from circulation. Prices then leveled off and fell back toward their original level.

The next major inflation in American history followed the War of 1812, which was basically a carbon copy of the Revolutionary War inflation. The principal method of deriving Federal revenue was imposing import taxes or tariffs. But we were at war with our major trading partner, England, and tariffs had fallen off drastically. In order to fight the war we therefore issued large quantities of paper currency which produced a rise in the general price level. Again, however, to the credit of our forebearers, when the war was over the Congress established a Second Bank of the United States that redeemed paper currency at par. Prices leveled off and declined back toward their original level as the paper currency was withdrawn from circulation.

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Note: An earlier version of this paper was presented at Hillsdale College, Hillsdale, Michigan, in connection with a seminar sponsored by the Center for Constructive Alternatives entitled “Energy or Exhaustion: The Planet as Provider.” See *imprimis* (November 1974), pp. 1-6.

The next major inflation in American history occurred during the American Civil War. The Federal Government ran a \$1 billion deficit, which was without precedence in history. It financed a large part of this deficit by issuing Greenback Notes. These Greenback Notes expanded the money supply by over 150 percent, and prices roughly doubled from 1860 to 1865. At the end of the war taxes were left at their war-time level and Government spending was cut back drastically. The Government surplus drew Greenbacks out of circulation and the Treasurer of the United States burned them. As the money supply declined prices fell off, and by 1879 we went back on the gold standard at exactly the same par value that existed in 1860 because prices had been driven back down to their previous level.

The next major inflation in American history occurred in World War II. The Federal Government ran a large deficit and the money stock more than doubled as the Federal Reserve monetized a part of the debt. As the Government entered the market armed with newly printed money, it drove up prices, increasing overall prices by over 60 percent during the Second World War. By the end of 1946, we were approaching a balanced budget, and by 1947 price increases had ceased. We established a period from 1947 to 1962 (except 1950) which proved to be one of the most prolonged periods of stable prices and stable economic growth in the Twentieth Century.

### *The Current Inflation*

The next major inflation in American history occurred with the initiation of massive Government expenditures on the Vietnam War. *We are today in the fifth major inflation in American history — and its source is identical to the four inflations that preceded it. The current inflation differs only by the fact that it has been carried over into a peacetime period; this is the only peace-time inflation of any real significance in the entire history of our country. Our present inflation has been caused by the fact that since 1965 the Federal Government has run a \$100 billion deficit and has financed 40 percent of that deficit by printing money.*

It is fundamentally important to note the difference in the impact on the economy caused by Federal financing through taxation and borrowing, as opposed to printing money. When the Government taxes and spends the receipts of those taxes, the ability of the private consumer to purchase goods and services is diminished by the amount of the tax. Therefore, the

increase in total spending as a result of the increase in Government spending is quite small. If the Government goes onto the bond market and sells bonds, competing with private firms and private individuals for loanable funds, the competition simply drives up interest rates as Government diverts funds away from private investment projects. In this case, private spending falls by the amount that public spending increases. In the case of selling Government bonds to the Federal Reserve, which in turn gives the Treasury the capacity to write checks drawn on the Federal Reserve, there is no corresponding decrease in private spending. So the increase in Government spending represents a net increase in total demand for goods and services.

There is a simple rule of thumb to follow in gauging the relation between the growth in the money stock, the growth in the economy, and changes in prices. Remember what money is used for — it is used to buy and sell goods and services and consummate exchange. We have found in economics that as the level of economic activity grows with the growth in income and commerce, the demand for money grows by a corresponding amount. So if the economy grows at about 3 percent a year, which has been the average growth rate throughout the entire history of the United States, then the economy will absorb a 3 percent growth in the money supply with no change in prices. For example, from 1947 to 1962 the Federal Government ran small deficits and the money stock grew at about 3 percent per year as the Federal Reserve purchased Government securities in the open market to keep interest rates low. The economy grew at about 3 percent a year so that the increase in money supply was simply absorbed in the consummation of exchange, and prices remained virtually stable for the entire period. One exception was the year 1950, when the economic impact of the Korean conflict was felt; the money supply grew by 10 percent and prices increased 10 percent.

Beginning in 1964 we had large increases in Federal spending to finance unprecedented domestic expenditures on the War on Poverty and on Great Society programs. With the escalation of the war in Vietnam we saw the Government deficit rise from a fairly low level in 1964 to \$25 billion a year in 1968. The so-called anti-inflationary surcharge imposed in 1968 had no real impact on inflation rates because Government expenditures grew more rapidly than tax receipts. As a result, in 1968 we ran a record peacetime deficit and the money supply grew by almost 8 percent.

In 1969, when President Nixon took office, we made the only real attempt in the whole inflationary period to stop the inflation. Beginning in January, President Nixon brought the budget into balance, and the rate of growth in the money stock from January to June was zero percent. This policy worked because the rate of price increase, which was almost 6 percent on an annual basis in December and January, had fallen to a 2.7 percent rate by June. But in April, May, and June the unemployment rate jumped significantly.

Unemployment rose principally because in the wage negotiations which occurred in the fall of 1968, wage contracts were based on the assumption of a continuation of 5-7 percent inflation rates. This expectation was realistic, given our previous five-year experience. So an employer who expected the productivity of his workers to rise by 2 percent was willing to negotiate a 7-9 percent wage increase if he expected the price of his product to rise by 5-7 percent. Workers, being aware of the same set of circumstances, were unwilling to accept any smaller pay increase. If the Federal Government had continued its expansionary monetary and fiscal policy, such wage negotiations would have caused no changes in the unemployment rate. But when the Federal Government reversed its monetary policy in an attempt to stabilize prices, and the rate of price increase fell below 3 percent by June, the wages that had been negotiated in the fall of 1968 were too high for full employment and workers were laid off.

The Federal Government at this point faced a crucial decision between two options. (1) It could reverse its monetary policy, reflate, and therefore seek to drive up prices, which would produce a fall in real wages to the point necessary to produce full employment; or (2) it could maintain its monetary policy, and allow the new contracts written in the fall of 1969 to be based on a 2.7 percent inflation rate and a higher unemployment rate.

In 1969 and 1970 the Government reversed its policy and began to inflate at an increasing rate in the last six months of 1969 and 1970. By January of 1971 the inflation rate was back up to a 6 percent annual rate and the unemployment rate was beginning to slide. Since June of 1969, when we abandoned our only real attempt to stop the inflation, we have made no significant attempt to bring inflation under control in this country. We have sought to find easier solutions to our economic dilemma. At first, in the second half of 1969, we tried a voluntary approach. Then in 1971 we went to the mandatory approach when we imposed wage and price controls and attempted to

freeze prices and wages in the United States by Government edict.

While we in economics have a lot of data on inflation, we have even more data on wage and price controls. In fact, our first history of wage and price controls occurred 5,000 years ago when price controls were imposed in the fifth dynasty of ancient Egypt. Pericles imposed price controls in ancient Athens, and Diocletian imposed wage and price controls in ancient Rome. *And from the fifth dynasty of ancient Egypt to President Nixon's Phase IV price controls, all of these experiences have one thing in common — not one has ever worked. And they do not work for a very simple reason: they freeze prices at a level where the quantity demanded exceeds the quantity supplied. They simply turn price increases into shortages and stifle the incentive to produce, therefore causing output to fall.*

We have in fact produced a minor miracle in the United States in the 1970s, in that at various times we have produced a grain and a meat shortage through Government policy — in a country that has the most fertile land, the highest level of capital equipment and technology in agriculture, and the best educated farmer in the world. We have produced shortages of critical inputs to the production process, sending the country into a recession.

If one looks at what the Government says it is doing in its "anti-inflation" policy, and then looks at the growth in the monetary base to see what it is actually doing, there is only one conclusion that can be drawn. That conclusion is that Federal anti-inflation policy since June of 1969 has been a "fraud." *Over the last 12 months the monetary base has grown at almost an 8 percent annual rate. Never in history has such a rate of monetary expansion failed to produce rapid inflation.*

### *Pointing the Finger of Guilt*

When the Federal Government, in June 1969, stopped trying to do anything about inflation it turned its activities toward developing scapegoats in order to get Americans to blame their neighbor for their problems. Had the scapegoat strategy not been so effective, it would be humorous. How does this strategy work? Well, you have all heard it. It works basically as follows. A bureaucrat goes to a businessman and says, "Why are you increasing your prices?" And the businessman says, "Because our costs are rising." And then the bureaucrat says, "What is your major cost?" And the businessman says, "labor." And then the

bureaucrat concludes, "Well, labor unions cause inflation." And then the same bureaucrat goes to union leaders and says, "Why are you demanding such high wage increases?" And union leaders note that the consumer price index is up 12 percent in the past year, and that wages of hourly workers are 4 percent lower than they were a year ago in terms of real purchasing power dollars. And the bureaucrat says, "Well, who sets prices anyway?" And the labor leaders say, "businessmen." And the bureaucrat concludes, "Well, through price collusion and administered prices, businessmen create inflation."

Then, of course, another popular version of scapegoatism was employed by former Treasury Secretary John Connally. He said, "We are all causing inflation through our greed. We are all so greedy in competing against each other for goods and services that we are, through this competition, driving up prices. We have all just got to stand back and quit being so greedy." I guess the low point in scapegoatism was reached when Herbert Stein pronounced, just before his retirement from the Council of Economic Advisers, that the American people were responsible for inflation.

Picking up the scapegoat theme, Jack Anderson wrote an article in which he said high interest rates are the result of banker collusion in an attempt to drive up the interest rate to make fat profits at the public's expense. This statement, I think, showed that Jack Anderson knows nothing about banking and finance and nothing about economic history, because never in the history of the United States have we had high inflation rates which have failed to produce high interest rates, except during periods of capital rationing.

Our high interest rates over the last year, which have disrupted the long-term capital market, have been caused by irresponsible Government policy. I think it is important that we not allow bankers and businessmen to be used as scapegoats for Government failure. In fact, if one looks at nominal interest rates and the current inflation rates and attempts to draw any parallel between current interest rates, in terms of real resources borrowed, relative to real resources paid back, interest rates last year were not at historic highs, as we were told in the newspaper and on the news. They were at historic lows. We hear from Washington that Government economists marvel at record demand in the short-term credit market in the face of record high interest rates, but if one can borrow at 12.5 percent on prime commercial paper and the inflation rate is 12 percent, he is paying back in real terms only 0.5 percent interest. *It is indeed no marvel that the de-*

*mand for capital in the short-term credit market has been at a record high, because real interest rates have been at a record low.* Indeed, if the Federal Reserve had not been following an easy money policy through open market purchases of Government securities, interest rates on short-term credit would probably have reached 15 percent last year.

### *The Costs of Inflation*

While high nominal interest rates have not disrupted the short-term credit market, they have had a disastrous effect on the long-term credit market, and the reason is very simple to understand. Historically, we in the United States have been blessed with fiscally responsible Government. Indeed, if you throw out all the war years in American history, prices on the average have remained constant or fallen slightly throughout the entire history of the United States. As a result, we have had historically low nominal interest rates. Therefore, borrowers are loathe to commit themselves over 25 - 30 years to a nominal interest rate that, although it may be 2 percent or negative (in real terms) at current inflation rates, might later turn out to be an extremely disadvantageous rate if the current inflation should end. Secondly, at high inflation rates, funds have been diverted from their traditional channels, whereby savings flowed into commercial banks and savings and loans institutions, and were in turn loaned out to businesses to build new factories, to generate jobs, and to build new homes. As a result of high inflation rates and interest ceilings on banks and savings and loan associations, funds have been diverted into land and commodity speculation and large Government bond issues.

We are all aware of the impact of inflation on income redistribution, particularly on those with fixed salaries, the old, and the poor. There is no question that this is a major cost of inflation. But an additional, more important cost is the impact caused by diverting funds from traditional channels and disrupting the link between the saver and the investor. In this way, we are today planting seeds which will yield lower economic growth rates for a decade.

Today we have a 7.1 percent unemployment rate which is highly concentrated in two industries — the construction industry and the automobile industry. As the effects of the recession in these industries spread, the unemployment rate will rise further. High interest rates, uncertainty about future prices, and the availability of gasoline go a long way in explaining the plight of these industries. While the \$52 billion deficit in fiscal 1975 will stimulate these industries, most of

the stimulation will occur in nondepressed industries. A deficit of such magnitude will assure that interest rates will be bid up as Government competes with private industry for loanable funds. If the Federal Reserve monetizes 40 percent of this deficit, as it has done over the last decade, the money supply will expand by over 20 percent and double-digit inflation will occur in 1976, even if we experience the most rapid economic recovery in American history.

### **Government: The Cause of Inflation**

*How do we stop the inflation? Inflation has one cause and it has but one cure. And that one cure is to slow the rate of growth in the money supply. This can be accomplished only by closing the Government deficit.* Our inflation has resulted from the prevalence of a bankrupt (and bankrupting) idea within Government that money solves problems. If one looks at the historic growth pattern of Government spending over the history of the United States, it is very easy to discern that within the last 15 years there has been a fundamental change within our Government. From the birth of the United States it took over 180 years for the Federal budget to grow from roughly zero to \$100 billion. It took only ten years to grow from \$100 billion to \$200 billion, and it has taken only four years for it to grow from \$200 billion to \$300 billion. Despite the fact that Federal tax collections have grown by 110 percent over a decade, over three times the rate of economic growth, the Federal Government has failed to live within its budget. According to Treasury Secretary William Simon, *the Federal Government is deficit financing at such a rate that today it is absorbing 60 percent of all the funds raised in U.S. capital markets.*

In January I had the pleasure of working in Washington for my Congressman, Olin Teague, on the Energy Emergency Act. While I was there, Congressman Teague asked me if I would read some of the bills that he had to vote on during the period I was working for him. I noticed that despite the fact that I make my living reading and writing, I was unable to read the bills as fast as they came in, so the stack on my desk kept getting higher and higher. Finally, I realized that it was physically impossible for any Congressman to read the bills he had to vote on. I assert here today that no member of the United States Congress read the \$25 billion education act that has just become law. The sheer bulk of paperwork is so great that no effective research is being done in the Congress by those who are actually engaged in the process of making decisions in the public interest. We

are experiencing an attempt by the Congress to substitute money for ideas.

Probably the best statement of the money-solves-problems philosophy that I have ever heard was John Lindsay's statement shortly after he became mayor of New York. The gist of John Lindsay's message was as follows: people think New York City has a lot of problems, but New York City has only one problem — private affluence and public poverty. If my budget were simply twice what it is today I could solve every problem in New York City. The day John Lindsay left office his budget was over 2 times what it was the day he took office, and by every index from garbage collection to crime in the streets, New York City was a worse place to live the day he left than the day he came. And the reason is that money does not solve problems, ideas solve problems. And Government has had few viable ideas in 40 years.

The best personal example that I have witnessed of the bankruptcy of Government with regard to new and viable ideas was a call I received back in January. I was working in my office at Texas A & M and my secretary, who gets excited with very little provocation, came into my office and said, "Dr. Gramm, you're not going to believe this, but the President of the United States is on the telephone." And I said, "You're right, I don't believe it." Nevertheless, I picked up the phone and a very stern sounding lady said, "Is this Dr. W. Philip Gramm of Texas A & M University?" I said, "Yes, Ma'm." She said, "Dr. Gramm, this is the White House calling."

So I sat on the edge of my chair awaiting some message — some mission from my President — and a member of the White House staff came on the phone. He said, "Dr. Gramm, your name has been given to us by some very, very important people. We think you might be the kind of person that can help us develop a new and viable energy program, a system of Government controls and subsidies, a system of Government and industry mutual research and project participation. And as an index of our commitment to this project we are willing to commit \$20 billion."

He went on and used every 25-cent word in the English language. When he got through, being an Aggie, I said simply, "It is a happy coincidence that out of 211 million Americans you have called the right man, because I know exactly what to do." I told him that I envisioned a system which was not going to cost a penny, but in fact would make money. It would be so productive that we could tax its output and finance Government programs on the basis of its pro-

ductivity. I told him that I envisioned a system whereby we would allow people to own property, and we would allow them to combine this property with their God-given talents to produce output. We would allow them to sell output in a free market so that each individual, in attempting to maximize his own welfare, would operate at maximum efficiency. And each consumer, in attempting to maximize his own individual welfare, would economize on the things that were scarce and therefore expensive, and substitute for them things that were abundant and therefore cheap. In such a system, by rewarding production and innovation, we could assure a maximum level of economic growth. I told him that I was basically a modest person and that I wanted him to know this was not totally my idea; that in fact if he would like a written reference, he might look at Adam Smith's *Wealth of Nations*, written in 1776. And I hung up.

Well, I assumed that I would never hear from the White House again, but indeed they went to a great deal of trouble to get in touch with me. And that's how, as I expressed it, for about a two-month period, while I didn't invent free enterprise, I had the sole Washington distributorship on it.

### Conclusion

If we are to ever put an end to spiralling prices, shortages, high interest rates and, economic stagnation, we must stop the growth of Government and put our monetary and fiscal house in order. To reverse the trend of fiscal irresponsibility we need strong leadership, which is a scarce commodity in Washington today. We must resist the siren song of more and more Government spending and more and more Government controls, and stand up for the free enterprise system which has made us prosperous and free.

The hour is late. It has become quite fashionable to proclaim the inevitability of the demise of our system. Such a philosophy is a convenient escape. For if there is not hope, we are not obligated to do anything. In fact, there is no real reason for pessimism. We have human talents on our side. We have money

and economic power on our side, and most important, we have history on our side. We have, in the American free enterprise system, the most successful economic system in the world. It has elevated us from a powerless nation, 90 percent of whose citizens were in poverty — by any measure — at the time of the Revolution, into the greatest agricultural and industrial power on earth. So successful is our system and so high are the aspirations of the American people that we define poverty at an income level that is higher than the average income level of the world's second most powerful nation. Yet, paradoxically, this great system is under attack at all levels of Government, and is being replaced by a system which has never worked in history and which is working effectively no where in the world today. The greatest product in history is not selling for the simple reason that it has no salesman. Those within our Government who supposedly represent our views are defending our system with an ineptitude unparalleled in the history of the Republic. To reverse this trend we need but a unit of will.

I wish to tell you today that I am optimistic about the future of America, and I am optimistic about the future of the American free enterprise system. If we have learned anything in the 1970s, it is that big Government cannot solve problems, and that spending more of the taxpayers' money cannot turn a bad idea into a good one. Everywhere I go in Texas and in our nation I find the American people feel a sense of helplessness. They know big Government is not working, they know something is out of kilter, but they don't know what to do about it. What we need today, more than at any time in the history of the United States, is a new wave of leadership to turn this country around. We need this leadership to fulfill the ideals and aspirations of a revolution which occurred almost two hundred years ago. In the coming struggle for the survival and the success of the American experiment, I call upon you as our business and civic leaders not to be merely passive observers, but to be active participants. While I cannot speak for the actions of others, in my own case I mean not only to participate, I mean in that participation to lead.



# Operations of the Federal Reserve Bank of St. Louis - 1974

JEAN LOVATI

**T**HE Federal Reserve System consists of the Board of Governors, located in Washington, D. C., and twelve Federal Reserve Banks located in districts across the United States. The Federal Reserve Bank of St. Louis serves the Eighth Federal Reserve District which includes all of Arkansas and parts of Illinois, Indiana, Kentucky, Mississippi, Missouri, and Tennessee. To assist in servicing the area, branches of the St. Louis Federal Reserve Bank are located in Little Rock, Louisville, and Memphis.

The St. Louis Federal Reserve Bank and its branches perform a variety of services for the public, commercial banks, and the United States Government. These services include collecting and clearing checks, transferring funds, distributing coin and currency to commercial banks, and conducting fiscal agency operations for the Federal Government. The Bank also extends credit to member banks and supervises certain commercial banks to promote sound banking practices. This report reviews most of the operations and functions of the St. Louis Federal Reserve Bank and its branches during 1974. The actions of the Bank, along with the other eleven Federal Reserve Banks and the Board of Governors, in formulating and implementing monetary policy are discussed in other issues of the *Review*.

## **Bank Supervision and Regulation**

The Federal Reserve Bank of St. Louis, along with the state banking authorities, supervises state chartered member banks in the Eighth Federal Reserve District. Bank supervision encompasses a wide variety of technical functions relating to the operations of member banks. The Bank Supervision and Regulation Department oversees the admission of state banks into the Federal Reserve System, conducts annual bank examinations, and analyzes periodic reports of condition. It reviews proposed mergers resulting in state member banks and applications to open new branches by these banks.

The most familiar form of supervisory activity is bank examination, through which information is collected on the current financial condition of individual banks. The examiners ascertain whether state member banks are complying with the applicable laws and regulations and evaluate each bank's assets, liabilities, capital, liquidity, operations, and management.

The 88 state member banks in the Eighth District were examined by St. Louis Federal Reserve Bank examiners in 1974. These banks are also subject to examination by state banking authorities. The 343 national banks in the Eighth District, which are required by law to be members of the Federal Reserve System, are examined by the staff of the Comptroller of the Currency. State nonmember banks that are insured by the Federal Deposit Insurance Corporation (FDIC) are examined by the FDIC along with the respective state banking authorities. The noninsured banks in the District are examined by state examiners only.

Federal Reserve Banks also supervise bank holding companies. At the end of 1974, the Federal Reserve Bank of St. Louis had jurisdiction over 17 multibank holding companies and 73 one-bank holding companies. The Bank Supervision and Regulation Department, with the assistance of the Legal and Research Departments, analyzes applications for bank holding company formations and holding company acquisitions of additional banks and firms in industries closely related to banking. In reviewing an application, these departments consider the financial history, conditions, and prospects of the institutions involved, and evaluate the quality of management. The legal aspects of the proposal and its likely effects on banking competition are assessed. During 1974, this Bank processed 11 applications to form one-bank or multibank holding companies and 39 applications by holding companies to acquire additional subsidiaries.

Bank holding companies are required to file annual reports with the Reserve Banks. These annual reports are analyzed by the staff of the Bank Supervision and Regulation Department to verify accuracy and completeness, to ascertain the financial conditions of the holding company and its subsidiaries, and to determine compliance with applicable laws and regulations. Examination reports submitted to the primary supervisory agency of the respective bank subsidiaries are also analyzed by the Federal Reserve Bank to determine the overall conditions of such subsidiaries. In addition, the Bank conducts discretionary on-site inspections of bank holding companies. The purpose of these inspections is similar to that of examinations of subsidiary banks.

Table I

VOLUME OF OPERATIONS<sup>1</sup>

	Number (thousands)		Percent Change	Dollar Amount (millions)		Percent Change
	1974	1973		1974	1973	
Checks handled <sup>2</sup> . . . . .	614,104	585,713	4.9%	\$210,413.3	\$191,460.3	9.9%
Transfers of funds . . . . .	614	494	24.3	691,202.7	491,244.9	40.7
Currency received and counted . . . . .	257,873	273,304	-5.7	2,400.1	2,147.0	11.8
Coin received and counted . . . . .	1,292,669	1,291,315	0.1	127.8	131.3	-2.7
U.S. Savings Bonds and Savings Notes <sup>3</sup> . . . . .	11,422	11,021	3.6	668.2	642.6	4.0
Other Government Securities <sup>3</sup> . . . . .	674	493	36.7	28,326.2	23,832.0	18.9
U.S. Government coupons paid . . . . .	646	683	-5.4	257.9	242.6	6.3
Food stamps received and counted . . . . .	180,365	142,635	26.5	427.7	315.6	35.5

<sup>1</sup>Total for the St. Louis, Little Rock, Louisville, and Memphis offices.

<sup>2</sup>Excludes Government checks and money orders.

<sup>3</sup>Issued, serviced, and redeemed.

### Check Collection

Checks drawn on commercial banks are the major means of settling daily financial transactions, since in most cases payment by check is more convenient than payment by currency. The use of checks is facilitated by the collection and clearing operations of the Federal Reserve Banks, which provide a mechanism for settlement of checks collected by commercial banks. Settlement is made by entries to the reserve accounts of member banks.

Since the number of checks cleared has increased rapidly in recent years, the Federal Reserve System has instituted a method to improve the handling, clearing, and settling of checks and to increase the speed of the payments mechanism. Regional Check Processing Centers (RCPCs) have been established in key cities across the country for these purposes. RCPCs are facilities which serve a geographic area wherein checks drawn on participating banks are processed overnight.

The Federal Reserve Bank of St. Louis and its branches each have been defined as an RCPC. A zone has been established for each center which corresponds to that portion of the Eighth District served by the respective offices. Overnight check clearing within the zones has been expanded since 1972 to include additional counties, thus providing more banks with this faster service. The RCPC zones of the Memphis and Louisville branches have already been expanded to cover the entire areas served by these offices. Approximately 90 percent of the dollar volume of checks in the Little Rock zone and 80 percent of the dollar volume in the St. Louis zone are on an immediate payment basis.

The four Eighth District Federal Reserve offices cleared 614 million checks with a dollar volume of \$210 billion in 1974. This represents a 4.9 percent increase in number and a 9.9 percent increase in dollar volume over 1973 (See Table I).

### Electronic Transfer of Funds

In order to further increase the efficiency and speed at which funds are transferred, the Federal Reserve Bank of St. Louis is expanding its part of the Federal Reserve Communications System. A computer at the Bank serves as the communication and switching center for the entire Eighth District. Member banks may use the System's network to transfer to other member banks funds of \$1,000 or more for their own accounts, or for their customers, anywhere in the country without charge. These transfers are most often used for large transactions and for those requiring immediate payment. Nonmember banks have access to this service indirectly through member banks.

Significant changes in the structure of the communication network in the Eighth District were implemented in 1974. Recently, on-line terminals were installed at the three St. Louis commercial banks having the largest volume of funds transferred through the St. Louis Federal Reserve Bank. These terminals are linked directly to the Bank's computer and enable the banks to initiate fund transfers directly from their offices. Previously, banks usually telephoned or teletyped the necessary information to the St. Louis Federal Reserve Bank for transmission. Now a transfer initiated by means of an on-line terminal is switched automatically by computer through the Federal Reserve Bank of St. Louis to the Federal Reserve office

As of February 1, 1975

## Directors

### *Chairman of the Board and Federal Reserve Agent*

EDWARD J. SCHNUCK, Chairman of the Board,  
Schnuck Markets, Inc., Bridgeton, Missouri

### *Deputy Chairman of the Board*

SAM COOPER, President,  
HumKo Products, Division of Kraftco Corporation,  
Memphis, Tennessee

RALPH C. BAIN, Vice President and General Manager,  
Arkla Industries Inc., Evansville, Indiana

DONALD N. BRANDIN, Chairman of the Board and President,  
The Boatmen's National Bank of St. Louis,  
St. Louis, Missouri

FRED I. BROWN, JR., President, Arkansas Foundry Company,  
Little Rock, Arkansas

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Bank of Murphysboro, Murphysboro, Illinois

TOM K. SMITH, JR., Group Vice President, Monsanto  
Company, St. Louis, Missouri

WM. E. WEIGEL, Executive Vice President and Chief  
Executive Officer, First National Bank and Trust  
Company, Centralia, Illinois

HARRY M. YOUNG, JR., Farmer,  
Herndon, Kentucky

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and Chief Executive Officer, Union National  
Bank of Little Rock, Little Rock, Arkansas

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Porter Paint Co., Louisville, Kentucky

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Citizens Fidelity Corporation, Louisville, Kentucky

JAMES C. HERNDERSHOT, President, Reliance Universal,  
Inc., Louisville, Kentucky

HAROLD E. JACKSON, President, The Scott County State  
Bank, Scottsburg, Indiana

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Bank and Trust Company of Bowling Green, Bowling  
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Arkansas, Forrest City, Arkansas

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& Co., Memphis, Tennessee

WILLIAM WOOTEN MITCHELL, Chairman, The First National  
Bank of Memphis, Memphis, Tennessee

CHARLES S. YOUNGBLOOD, President and Chief Executive Officer,  
First Columbus National Bank, Columbus, Mississippi

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CHARLIE L. EPPERSON, JR., *Assistant Vice President*

of the receiving commercial bank with no direct involvement by personnel at the St. Louis Federal Reserve Bank. If the receiving bank is also on-line, the transfer is again automatically switched by computer to that bank through its Federal Reserve office without being handled by the personnel at that office.

As the fund transfers are processed, the computer generates the accounting data and other information needed to complete the transaction. This information is then used to update member banks' reserve accounts. Banks with on-line terminals receive an immediate record of each transaction.

Three commercial banks in St. Louis and two commercial banks in Memphis plus the St. Louis, Louisville, and Memphis Federal Reserve offices are now on-line to the Bank's computer. A funds transaction may require as long as 2-3 hours for completion when information is telephoned or teletyped to the Federal Reserve Bank. Automated switching has reduced that time to 2-3 minutes, and has reduced the number of transfers handled by the Bank's personnel by 70 percent. An average of 937 transactions per day sent and received are no longer handled by the personnel of the Federal Reserve Bank of St. Louis since the installation of on-line terminals at the three St. Louis commercial banks.

The Federal Reserve Bank of St. Louis facilitated the transfer of more than \$290 billion of funds in 1974. This represents a 26 percent increase from the \$231 billion transferred in 1973. During 1975, the Little Rock branch and nine additional large volume banks in the Eighth District are expected to be directly linked to the computer facilities at the St. Louis Federal Reserve Bank through on-line terminals.

### *Coin and Currency*

Although checks and wire transfers are the major means of payment in this country in terms of dollar volume, coin and paper currency are indispensable and are used in the greatest number of transactions. Currency is more widely acceptable than checks and is a more convenient means of settling relatively small transactions. To meet the public's demand for cash, a member bank orders currency from its Federal Reserve Bank, which charges the order to the member's reserve account. On the other hand, if a member bank has excess currency, it may deposit currency at the Federal Reserve Bank and receive credit in its reserve account. Nonmember banks generally receive or deposit coin and currency through member banks. Currency is sorted at the Reserve Banks and that

which is no longer usable is removed from circulation and destroyed. During 1974, currency totalling \$809 million was verified and destroyed.

Combined sorting, counting, and wrapping of coin and currency at all four Reserve Bank offices in the Eighth District amounted to slightly less than 7.6 million pieces per working day during 1974. This volume represents a decrease of 13 percent compared to 1973.

### *Lending*

Federal Reserve credit is extended on a short term basis to member banks which intend to use this source of credit to meet their reserve requirements. There are three types of credit available to members from their Federal Reserve Banks: short-term adjustment credit, seasonal credit, and emergency credit. The interest rate at which these banks may borrow is called the discount rate. During periods when short-term market interest rates are lower than the discount rate, member banks may be reluctant to borrow from the Federal Reserve to cover temporary adjustment needs. Instead, they may obtain funds through the Federal funds market (where one commercial bank lends to another) or through the markets for other short-term instruments. On the other hand, if the discount rate is low relative to rates in these markets, Federal Reserve lending is likely to increase.

An amendment to Regulation A of the Federal Reserve Act was approved in 1974. This amendment authorizes the application of a special discount rate to certain types of lending to member banks. The special rate applies to Federal Reserve credit to member banks requesting large assistance over a prolonged period where there are exceptional circumstances involving only a particular member bank. The special rate would ordinarily be higher than the discount rate.

The discount rate at the beginning of 1974 was 7.5 percent. It was raised one time to a record 8 percent on April 26, and then lowered once to 7.75 percent on December 13. Short-term market interest rates remained above the discount rate throughout 1974.

The St. Louis Federal Reserve Bank made 2,164 advances totalling \$11.1 billion to 111 Eighth District member banks in 1974. During the previous year, 1,759 advances totalling \$11.1 billion were made to 95 member banks. The daily average of outstanding loans was roughly the same in 1974 and 1973, \$54.9 million.

The Federal Reserve Banks extend credit to smaller banks to tide these banks over peak seasonal demands for funds. Nine banks in the Eighth District made use of this seasonal borrowing privilege during 1974. All of the banks which used this privilege were located in predominantly agricultural areas. No emergency loans were granted.

### *Fiscal Agency*

The Federal Reserve Bank provides a number of services as a fiscal agent of the Federal Government. As banker for the Government, the Reserve Banks carry the principal checking accounts of the United States Treasury through which the Government receives and spends its funds. Government receipts come mainly from taxpayers and purchasers of Federal Government securities, and are deposited initially in Treasury tax and loan accounts at designated commercial banks. Periodically, these funds are transferred to Treasury accounts at the Federal Reserve Banks and spent.

The Reserve Banks also act as an agent for the Government in issuing and retiring Federal Government securities. When the Treasury offers new securities, the Reserve Banks publicize the sale and receive bids from banks, dealers, and others who wish to buy. In accordance with instructions from the Treasury, allotments of securities are made by the Reserve Banks which collect payment on the Government's behalf. After the securities have been issued and delivered, the Reserve Banks pay the interest on the securities and redeem them at maturity with funds from the Government's account.

In 1974, 11.4 million savings bonds and notes and 674,000 other Treasury issues with a combined dollar value of roughly \$29 billion were issued, serviced or redeemed by the four Eighth District Federal Reserve offices. During the year, 646,000 Government bond coupons valued at \$257.9 million were paid by these offices.

Another fiscal activity is the redemption of U.S. Government food stamps. A total of 180 million food stamps with a value of \$428 million were received and counted by the Federal Reserve Bank of St. Louis and its branches in 1974.

### *Research*

The Research Department contributes to national monetary policy through its collection and analyses of a wide range of regional, national, and interna-

tional economic data. The information is used by the President of the Bank in making monetary policy recommendations at meetings of the Federal Open Market Committee. This Committee, which consists of the Board of Governors and five of the twelve Reserve Bank Presidents, directs the purchase and sale of Treasury and Government Agency securities on the open market by the Federal Reserve System. The economic analyses of the Research Department are also useful to the Bank's Board of Directors in establishing, subject to approval by the Board of Governors, the Bank's discount rate.

The public also has access to data and information relating to economic developments through the Research Department's 10 regular publications. The *Review*, with a monthly circulation of 35,000, incorporates much of the analytical research done by the Research staff. Research staff members are encouraged to publish studies in professional journals as well.

In addition to these functions, the Research Department engages in studies of bank market structure. These studies include review and analysis of proposed bank holding company acquisitions and bank mergers. In this analysis, consideration is given to the expected effects of the proposed acquisitions and mergers on competition and on the convenience and needs of the area to be served.

### *Bank Relations and Public Information*

The St. Louis Federal Reserve Bank endeavors to maintain personal contact with all banks in the Eighth District and aids member banks in their actions dealing with the Federal Reserve. The Bank Relations and Public Information Department makes available to all Eighth District member banks the Federal Reserve Functional Cost Analysis Program which provides a cost-income profile of the participating bank's major functions. The individual bank can compare its current operating costs and revenue for individual services not only with its past performance but also with average figures for member banks of similar size. There were 46 banks participating in the program last year in the Eighth District.

Through this department, the Bank also maintains contact with the public. Officers and staff members of the St. Louis Federal Reserve Bank and its branches presented 227 addresses before groups of bankers, businessmen, and educators in 1974. The Bank was represented at 314 banker, 151 professional, and 225 miscellaneous meetings. During the year, 235 groups

Table II

COMPARATIVE STATEMENT OF CONDITION  
(Thousands)

ASSETS		December 31, 1974	December 31, 1973
U.S. Government Securities:			
Bills . . . . .		\$1,437,167	\$1,380,319
Certificates . . . . .		—	—
Notes . . . . .		1,564,002	1,437,002
Bonds . . . . .		128,351	117,801
<b>TOTAL U.S. GOVERNMENT SECURITIES . . . . .</b>		<b>\$3,129,520</b>	<b>\$2,935,122</b>
Discounts and Advances . . . . .	\$ 2,100	\$ 20,880	
Acceptances . . . . .	—	—	
Federal Agency Obligations . . . . .	183,812	72,482	
<b>TOTAL LOANS AND SECURITIES . . . . .</b>		<b>\$3,315,432</b>	<b>\$3,028,484</b>
Gold Certificate Account . . . . .	\$ 517,979	\$ 359,159	
Special Drawing Rights Certificate Account . . . . .	15,000	15,000	
Federal Reserve Notes of Other Banks . . . . .	47,993	48,880	
Other Cash . . . . .	21,197	18,610	
Cash Items in Process of Collection . . . . .	420,998	463,205	
Bank Premises (Net) . . . . .	13,560	13,822	
Other Assets . . . . .	36,961	31,711	
<b>TOTAL ASSETS . . . . .</b>		<b>\$4,389,120</b>	<b>\$3,978,871</b>

LIABILITIES AND CAPITAL ACCOUNTS  
LIABILITIES

	December 31, 1974	December 31, 1973
<b>FEDERAL RESERVE NOTES (NET) . . . . .</b>	<b>\$2,969,610</b>	<b>\$2,602,493</b>
Deposits:		
Member Bank — Reserve Accounts . . . . .	\$ 828,804	\$ 771,264
U.S. Treasurer — General Account . . . . .	154,696	178,196
Foreign . . . . .	9,860	8,840
Other Deposits . . . . .	18,737	15,344
<b>TOTAL DEPOSITS . . . . .</b>	<b>\$1,012,097</b>	<b>\$ 973,644</b>
Deferred Availability Cash Items . . . . .	\$ 305,965	\$ 310,996
Other Liabilities and Accrued Dividends . . . . .	41,348	34,768
<b>TOTAL LIABILITIES . . . . .</b>	<b>\$4,329,056</b>	<b>\$3,921,901</b>
CAPITAL ACCOUNTS		
Capital Paid In . . . . .	\$ 30,032	\$ 28,485
Surplus . . . . .	30,032	28,485
Other Capital Accounts . . . . .	—	—
<b>TOTAL CAPITAL ACCOUNTS . . . . .</b>	<b>\$ 60,064</b>	<b>\$ 56,970</b>
<b>TOTAL LIABILITIES AND CAPITAL ACCOUNTS . . . . .</b>	<b>\$4,389,120</b>	<b>\$3,978,871</b>

MEMORANDA: Contingent liabilities on acceptances purchased for foreign correspondents increased from \$19,757,000 on December 31, 1973 to \$33,415,000 on December 31, 1974.

requested films, and 3,802 visitors toured the Bank and its branches. The Bank's traveling currency exhibits were displayed at ten banks during 1974.

**Financial Statements**

Total assets of the Federal Reserve Bank of St. Louis and its branches at the end of 1974 were \$4.4 billion, an increase of 10.3 percent from the previous

year (see Table II). A \$111 million increase in Federal Agency obligations and a \$159 million increase in the Gold Certificate Account were the major sources of the increase in total assets. Approximately 71 percent of the Bank's assets were held in U.S. Government securities. The remaining assets, including the gold certificate account, the special drawing rights certificate account, notes on other Reserve Banks, and cash items in process of collection, totalled \$1.3 billion.

Liabilities of the St. Louis Federal Reserve Bank and its branches increased 10.4 percent over the 1973 level, to \$4.3 billion. This increase primarily resulted from a 14.1 percent increase in Federal Reserve Notes, the principle type of currency in circulation. These notes amounted to \$3.0 billion, approximately 69 percent of the Bank's total liabilities at year end 1974. Deposits, consisting mainly of member bank reserve accounts, amounted to \$1.0 billion, an increase of 4.0 percent.

Table III

COMPARATIVE PROFIT AND LOSS STATEMENT  
(Dollar Amounts in Thousands)

	1974	1973	Percent Change
Total earnings . . . . .	\$229,890	\$180,673	27.2%
Net expenses . . . . .	32,732	27,791	17.8
Current net earnings . . . . .	197,158	152,882	29.0%
Net additions (+) or deductions (-) . . . . .	-2,414	-2,862	15.7
Net earnings before pay- ments to U.S. Treasury . . . . .	\$194,744	\$150,020	29.8%
Distribution of Net Earnings:			
Dividends . . . . .	\$ 1,764	\$ 1,667	5.8%
Interest on Federal Reserve Notes . . . . .	191,433	146,823	30.4
Transferred to Surplus . . . . .	1,547	1,530	1.1
<b>TOTAL . . . . .</b>	<b>\$194,744</b>	<b>\$150,020</b>	<b>29.8%</b>

Federal Reserve Banks' earnings result from interest on Government securities, interest on loans to member banks, and reimbursements of certain fiscal agency functions. In 1974, the portion of the Federal Reserve System's earnings allocated to the St. Louis Bank and its branches totalled \$230 million, an increase of 27.2 percent from the previous year (see Table III). After statutory dividends of \$1.7 million were paid to member banks and operating expenses of \$32.7 million were covered, \$1.5 million was transferred to surplus and \$191 million was paid to the Treasury as interest on Federal Reserve notes.

# Financing Government Through Monetary Expansion and Inflation

CHARLOTTE E. RUEBLING

**O**VER THE last ten fiscal years Federal Government expenditures have exceeded Government receipts, primarily taxes, by more than \$70 billion. Over half of this cumulated deficit has been financed through monetary expansion. Faster growth of the money stock over this period, in turn, has led to an increased rate of inflation.

Monetary expansion and inflation engender some of the same effects as increases in taxes; they reduce the wealth of some members of the private sector and increase the Government's command over real resources. Unlike tax rates, however, rates of monetary expansion have not been legislated explicitly. Instead, they have resulted from the implementation of monetary policy in a framework where monetary policy actions are not independent of legislated budget decisions. This article discusses the mechanisms through which monetary expansion and inflation act similarly to taxes in that they finance Government and redistribute wealth.

The section entitled "Monetary Expansion" describes institutional arrangements which determine who, in the first instance, receives the spending power generated by monetary expansion. Banking laws, such as those pertaining to reserve requirements and interest payments, influence the proportions of an increase in the money stock that accrue to the Government and to the stockholders, deposit holders, and loan customers of banks. Under the institutional arrangements prevailing in the United States and most other countries today, at least a portion of an increase in the money stock is a source of finance for the Government, which in turn benefits those who gain from Government spending and those who would otherwise be taxed as an alternative means of finance.

The section entitled "Inflation as a Tax" describes how unanticipated inflation transfers real wealth from net monetary creditors to net monetary debtors and how inflation, even though anticipated, is a tax on holding money. Because the Federal Government is a net monetary debtor and can create money, these transfers help to finance Government expenditures.

Rampant inflation can diminish the willingness of the private sector to accept money in exchange for

goods and services. To the extent that anticipation of inflation has this effect, monetary expansion and inflation become less effective means for the Government to acquire and transfer resources. Limits to the effectiveness of inflationary finance are discussed in the last major section of the paper.

## MONETARY EXPANSION

The gains which accrue to issuers of money are derived from the difference between the costs of issuing money and the initial purchasing power of new money in circulation. Such gains are called "seigniorage."<sup>1</sup> If the goods and services for which the issuer exchanges money have a market value greater than that of resources used to produce the money, then the issuer receives a net gain. Banks, for example, gain if the stream of income purchased from a given amount of created deposit money exceeds the stream of costs of producing that money, including interest payments on deposits. In general, the costs of issuing money vary according to what serves as money and the conditions under which it is produced and supplied to the economy, while the initial purchasing power of new money depends on the demand for money in the economy and the quantity already in circulation.

<sup>1</sup>For a discussion of seigniorage, see Hubert C. Grubel, "The Distribution of Seigniorage from International Liquidity Creation," *Monetary Problems of the International Economy*, ed. Robert A. Mundell and Alexander K. Swoboda (Chicago: The University of Chicago Press, 1969), pp. 269-82; and Harry G. Johnson, "Appendix: A Note on Seigniorage and the Social Saving from Substituting Credit for Commodity Money," *Monetary Problems*, pp. 323-29.

Johnson shows two formulas for seigniorage.

$$(1) \quad \sum_{t=0}^{\infty} \frac{v-c}{(1+i)^t} = (v-c) \frac{1+i}{i}$$

where "v" is circulating value, "c" is the cost, and "i" is the interest rate prevailing in the period between recoinages. He notes: "This expression differs from the usual formula for capitalized value of an income flow because the first yield accrues immediately." [Johnson, "Appendix," p. 323.]

$$(2) \quad [(1-c) + \frac{(i-c)}{i} g]M = (i-c) \frac{(i+g)}{i} M = \frac{(i-c)}{i} (i+g)M$$

where "c" is the real cost stream associated with a unit of the money stock, "i" is the interest rate on assets, "g" is the growth rate of demand for money at a stable price level, and "M" is the existing money supply. [Johnson, "Appendix," pp. 325-26.]

## Costs of Issuing Money

The costs of issuing money vary with the type of money. For commodity money, such as gold, the costs are reflected in the value of the commodity itself and in the expense of minting coins. The costs of issuing paper money are paper and engraving, and the costs of producing deposit money are bookkeeping and servicing the accounts.

The costs of producing a given amount and type of money also differ according to whether they are viewed as the outlays of the issuer or as the costs to society. From the point of view of society as a whole, the costs of producing money are the real resources absorbed and not available for use elsewhere. To society, then, interest payments on deposits are not a cost; they do not represent resources absorbed in the use of money, but rather a transfer of command over resources among members of the society.<sup>2</sup> The issuer of deposits, on the other hand, would view these interest payments as a cost.

The total real wealth of society is enhanced when fewer real resources are absorbed in the use of money.<sup>3</sup> Under most circumstances the market value of resources required for a given amount of paper or deposit money is less than the market value of resources required for the same amount of commodity money. Hence, from the point of view of society, real costs are lower for paper and deposit money than for commodity money.<sup>4</sup>

## The Demand for Money

Money is that asset which minimizes the costs of exchanging assets; in other words, it serves as a medium of exchange. Money also serves as a reliable form in which to hold purchasing power as long as the value of money in exchange is stable. Even if the general price level is not stable, money serves as a hedge against relative price shifts — for example, large declines in the current price of common stocks relative to the prices of some other assets. Because of these services, people are willing to give up other

goods and services in exchange for money. We would expect that the amount of money demanded at any given time depends on the importance of the services performed by money compared to other goods and services and on the reliability with which the particular form of money serves as a medium of exchange and a store of value. For example, as an economy increases in population, output, and complexity, the demand for the services of money would tend to rise. If, in addition, money holdings were expected to yield a return in terms of rising purchasing power over time, we would expect the amount of money demanded to rise further. On the other hand, an expected decline in the purchasing power of money would tend to depress the demand to hold wealth in the form of money.

## Who Issues Money and Who Gains from Expansion of the Money Stock?

The assets which most consistently serve as money in our economy are currency, coin, and demand deposits.<sup>5</sup> Currency and coin, which account for about one-fourth of these assets, are issued by the Treasury or Federal Reserve Banks. Demand deposits, which account for the remaining three-fourths of the money stock, are issued by commercial banks.

Even though private institutions issue the largest part of the money stock, the total amount of money in the economy is dominated by Federal Reserve and Treasury actions. Bank deposits are backed by reserves, and the Federal Reserve System and Treasury carry primary responsibility for the total amount of reserves and currency in our economy. In other words, the Federal Reserve and Treasury dominate the issue of “high-powered” money or “base” money, which consists of currency held by the public and bank reserves, as shown in Table I.<sup>6</sup>

The main sources of high-powered money are, or are closely related to, Treasury or Federal Reserve actions. A rise in the magnitude of the base resulting from a rise in the dollar value of the gold stock, for example, can occur through transactions involving the Treasury and Federal Reserve System following a

<sup>2</sup>“c” in formula (2) in footnote 1 of this article would be a transfer of seigniorage from the issuers of money to the holders of money. See Johnson, “Appendix,” p. 326.

<sup>3</sup>Karl Brunner and Allan H. Meltzer, “The Uses of Money: Money in the Theory of an Exchange Economy,” *The American Economic Review* (December 1971), pp. 801-2.

<sup>4</sup>Confidence in paper money is an important characteristic whose costs to society may vary from time to time. See Benjamin Klein, “The Competitive Supply of Money,” *Journal of Money, Credit and Banking* (November 1974), pp. 423-53.

<sup>5</sup>Demand deposits and currency in the hands of the public comprise the money stock as it is “narrowly defined” (M1). M2 is a broader measure, adding time deposits other than large certificates of deposit at commercial banks to M1. M3 adds savings and loan and mutual savings bank deposits to M2.

<sup>6</sup>There are several refinements of this magnitude — for example, source base and monetary base. See Leonall C. Andersen and Jerry L. Jordan, “The Monetary Base — Explanation and Analytical Use,” this *Review* (August 1968), pp. 7-11.

Table I

CALCULATION OF THE SOURCE BASE — DECEMBER 1974

Monthly Averages of Daily Figures<sup>1</sup>  
(Millions of Dollars)

<u>Sources of Base</u>		<u>Uses of Base</u>	
Federal Reserve Credit:		Member Bank Deposits at Federal Reserve	+ \$ 29,819
U.S. Government Securities <sup>2</sup>	+ \$ 87,401	Currency in Circulation	+ 78,927
Loans	+ 704		
Float Plus Other Federal Reserve Assets	+ 5,915		
Gold Stock Plus Special Drawing Rights Certificate Account	+ 12,030		
Treasury Currency Outstanding	+ 9,180		
Treasury Deposit at Federal Reserve Banks	- 1,741		
Foreign Deposits with Federal Reserve	- 357		
Treasury Cash Holdings, Other Liabilities and Capital Accounts and Other Federal Reserve Deposits	- 4,385		
Source Base <sup>3</sup>	\$108,747		\$108,746

<sup>1</sup>Data are not adjusted for seasonal variation.

<sup>2</sup>Includes Federal agency issues.

<sup>3</sup>The sums of sources and uses differ due to rounding.

Source: Board of Governors of the Federal Reserve System, *Federal Reserve Bulletin*.

devaluation of the dollar.<sup>7</sup> The largest source of the base and the one associated with most changes in the base is the expansion of Federal Reserve holdings of Government securities.

Money creation need not be a printing press operation in order for it to provide the Government with funds. Expansion of central bank holdings of Government debt provides the Treasury with funds just as certainly as increased output of its engraving and printing facilities. Over the last ten years Federal Reserve holdings of Government securities have risen by over \$40 billion. This increase, in turn, has served as a basis for growth of the money stock.

As mentioned above, commercial banks issue demand deposits, which comprise the major portion of our money stock. Demand deposits are issued on the basis of high-powered money that is not being used as currency in the hands of the public or as required reserves against deposits. When high-powered money enters the banking system, it becomes both a bank deposit and bank reserves. Since the proportion of deposits that banks are required to hold as reserves is less than 100 percent, high-powered money in the form of reserves enables the banking system to further expand the money stock by issuing additional deposits when they make loans.<sup>8</sup>

<sup>7</sup>See Albert E. Burger, "The Monetary Economics of Gold," this *Review* (January 1974), pp. 2-7.

<sup>8</sup>Reserve requirements on demand deposits at member banks currently range between 7.5 percent and 16.5 percent, depending on the dollar amount of deposits at the bank.

Commercial banks gain from issuing money if the stream of income from loans and investments, undertaken with reserves in excess of requirements, exceeds the costs of issuing money. Banks make no explicit interest payments to holders of demand deposits, but do nevertheless incur costs in the servicing of accounts.<sup>9</sup>

Commercial banks receive no interest payments on the portion of their assets held as reserves either at Federal Reserve Banks or as vault cash. Hence, higher reserve requirements inhibit commercial banks' opportunities to gain from issuing deposits. If banks were required to hold reserves equal to 100 percent of deposits, the money stock would equal high-powered money and all proceeds from monetary expansion would accrue to the Government alone.

A number of writers have noted that if there were competition in the issuance of money and no prohibition of interest payments on demand deposits, competing banks would try to attract deposits by offering to pay interest on them. The outcome of the competition would be the transfer of gains from the issuers of money to the holders of money, that is, from bank stockholders to bank deposit holders. Some have argued that such competition would lead to excessive

<sup>9</sup>Since 1933, commercial banks in the United States have been prohibited by law from making explicit interest payments on demand deposits. See James M. O'Brien, "Interest Ban on Demand Deposits: Victim of the Profit Motive?" *Federal Reserve Bank of Philadelphia Business Review* (August 1972), pp. 13-19.

monetary growth.<sup>10</sup> However, if competition in the payment of interest were accompanied by some minimum reserve requirements, then the Government would hold a constraint on monetary expansion.

In this case the public would no doubt be tempted to hold no currency at all, since it pays no interest, and to hold cash only in the form of bank deposits; . . . The fact that banks may have legal or traditional reserve requirements, however, sets a lower limit on the ratio of currency (including bank reserves) to deposits: the most extreme possibility is that all newly issued currency (along with all old currency) flows immediately into the reserves of the banking system, which then issues new bank money in whatever ratio is permitted by its reserve ratio.<sup>11</sup>

Bank loan customers gain from monetary expansion when loans are made at interest rates below the market-clearing rate. Then part of the seigniorage that would otherwise accrue to a bank's stockholders goes to borrowers. This occurs to the extent that the yield on real resources acquired by the borrower is greater than the cost of acquiring them *because* the interest on the loan was below the appropriate market rate.<sup>12</sup>

### ***Who Loses from the Extraction of Seigniorage by the Issuers of Money?***

Those who experience lower wealth due to the ability of money issuers to obtain seigniorage essentially pay a tax to the issuer. The tax payment is the difference between actual wealth and what wealth would have been in the absence of seigniorage or if seigniorage were distributed as interest on holding money. Such losses may represent a social loss, that is, lower aggregate real wealth in the economy than under an alternative monetary arrangement.

. . . social welfare will be higher in a paper-money system with a fixed money supply than in one in which the money supply is expanded to keep the price level constant, because in the former system the falling trend of prices provides a yield to the holders of real balances and encourages a greater use of money, which greater use increases welfare at no social cost. (This proposition is subject to the qualification that if prices fall at a percentage rate

<sup>10</sup>Johnson, "Appendix," p. 327. For criticism and additional comment regarding this proposition, see Klein, "The Competitive Supply of Money."

<sup>11</sup>Martin J. Bailey, "The Welfare Cost of Inflationary Finance," *The Journal of Political Economy* (April 1956), p. 103.

<sup>12</sup>*Ibid.*, p. 104. Phillip Cagan, "The Monetary Dynamics of Hyperinflation," *Studies in the Quantity Theory of Money*, ed. Milton Friedman (Chicago: The University of Chicago Press, 1956), p. 79.

greater than the rate of return on real assets, the public will want to hold money rather than real assets and the system is likely to break down.)

The issue of additional paper money at a rate sufficient to keep the price level constant yields seigniorage to the monetary authority equal to the real value of the quantity of money multiplied by its rate of growth . . . by comparison with a paper-money system in which the quantity of money is fixed (and subject to the qualification mentioned at the end of the previous paragraph), the levying of seigniorage by a monetary policy of maintaining stable prices involves a social loss, resulting from the restriction of the use of money as a consequence of its zero yield. In other words, the maintenance of a stable price level imposes an 'inflation tax' on holders of money, by comparison with a policy of keeping the money supply constant and allowing prices to fall over time (subject again to the aforementioned qualification).<sup>13</sup>

### ***Summary***

Who gains and who loses from the expansion of paper and deposit money while the price level remains unchanged depends on institutional arrangements for the expansion of the money stock.

(1) If the Government were the sole issuer of money, all of the seigniorage would go to the Government. Members of the private sector who acquired additional money balances would give up real goods and services in exchange for the services of money. To them, the cost for the services of money would equal the value of the goods and services exchanged, while to the Government, the cost would be only the outlay for paper, printing and bookkeeping.

(2) In a system where the Government issued bank reserves and currency yielding no interest to holders, and banks issued demand deposits which required a 100 percent reserve backing, the result would be the same as for case (1) above.<sup>14</sup>

(3) If the conditions of (2) above held except that reserve requirements were less than 100 percent, commercial banks would have the opportunity to gain seigniorage on deposits issued in excess of the amount of required reserves. This opportunity would induce banks to offer interest on deposits; competition for deposit holders, in turn, would result in gains being distributed to deposit holders through interest pay-

<sup>13</sup>Johnson, "Appendix," p. 325.

<sup>14</sup>It makes little difference if reserves and currency are issued primarily by the nation's central bank, as opposed to the Treasury, if net earnings of the central bank are returned to the Government Treasury, as is the practice in the United States.

ments. There would still be a gain to the Government, but it would be less than in cases (1) and (2) because people would tend to hold money in the form which yielded interest — deposits rather than currency. Government seigniorage would be earned only on the proportion of deposits required as reserves.

(4) If the conditions of case (3) above held except that banks were prohibited from paying interest on deposits, seigniorage would be earned by both the Government and banks. To the extent that banks charged an interest rate on loans less than an appropriate market rate, some of the banks' seigniorage would be distributed to loan customers.

### INFLATION AS A TAX

Some portion of monetary expansion which maintains a stable price level serves to finance Government spending, as discussed in the previous section. Rises in the price level, whether or not they are the result of monetary expansion, also serve to finance Government because of its status as a net monetary debtor and because of the progressive income tax.<sup>15</sup> It will be shown that unanticipated inflation reduces the wealth of net monetary creditors to the benefit of net monetary debtors and that inflation, even if correctly anticipated, reduces the wealth of money holders in proportion to their holdings of money.

#### Definitions

*Monetary assets* are claims to a fixed amount of dollars. Money, bonds, and pensions without escalator clauses, and contracts to provide labor services for a fixed salary or wage are examples of monetary assets.<sup>16</sup> *Real assets*, on the other hand, are claims to things whose dollar-value can vary. Houses, automobiles, and contracts to receive labor services are examples of real assets. *Monetary liabilities* are obligations to deliver a fixed amount of dollars. Loans typically are obligations to pay a given amount of dollars — principal plus interest — and are therefore monetary liabilities to the borrower. *Real liabilities* are

obligations to deliver goods or services whose price may change between the time the obligation was negotiated and the time the goods and services are delivered. A contract to provide labor services is a real liability to the worker.

The *net wealth* of an economic unit is equal to the sum of its monetary assets and real assets less the sum of its monetary liabilities and real liabilities. On a balance sheet, net wealth and its components take the following positions:

<u>Assets</u>	<u>Liabilities and Net Wealth</u>
Monetary Assets	Monetary Liabilities
Real Assets	Real Liabilities
	Net Wealth

The sums of the two columns are equal. *Net monetary creditors* are those whose monetary assets exceed their monetary liabilities. *Net monetary debtors* are those whose monetary liabilities exceed their monetary assets.

*Inflation* is a persistent decline in the purchasing power of money, or conversely, a persistent rise in the average price level of goods and services. *Unanticipated inflation* implies that market behavior is based on the expectation that the price level will rise at a slower rate than it actually does.<sup>17</sup> Inflation may be partially unanticipated if market participants expect the price level to rise, but underestimate the extent of the rise. *Anticipated inflation* is where market participants correctly foresee changes in the price level and make economic decisions accordingly.

#### Unanticipated Inflation and the Transfer from Net Monetary Creditors to Net Monetary Debtors

With inflation, the amount of dollars embodied in real assets and real liabilities tends to rise, while the amount of dollars claimed through monetary assets and committed through monetary liabilities remains fixed. Hence a change in the price level affects net wealth differently, according to the composition of net wealth.<sup>18</sup>

<sup>15</sup>With a progressive tax structure, as incomes and prices rise with inflation, income tax payments rise at a faster rate than prices have risen over the tax period. If income *doubles*, for example, as the result of inflation, with an unchanged progressive tax structure, income tax payments would *more than double* for individuals in many tax brackets. The Government's income tax revenues would therefore also be more than double their pre-inflation level.

<sup>16</sup>For a discussion of escalator clauses or "indexation", see Jai-Hoon Yang, "The Case For and Against Indexation: An Attempt at Perspective," this *Review* (October 1974), pp. 2-11.

<sup>17</sup>Reuben A. Kessel and Armen A. Alchian, "Effects of Inflation," *The Journal of Political Economy* (December 1962), p. 524.

<sup>18</sup>For additional discussions of this topic, see Armen A. Alchian and William R. Allen, *University Economics: Elements of Inquiry*, 3rd ed. (Belmont, California: Wadsworth Publishing Company, Inc., 1972), pp. 674-81; G. L. Bach, *The New Inflation: Causes, Effects, Cures* (Providence: Brown University Press, 1972), p. 25; G. L. Bach and James B. Stephenson, "Inflation and the Redistribution of

Exhibit I

Wealth Effects of Inflation

Net Monetary Debtor

Before Inflation		After Inflation			
Assets	Liabilities	In Money Terms		In Real Terms	
		Assets	Liabilities	Assets	Liabilities
MA \$100	ML \$200	MA \$100	ML \$200	MA \$ 50	ML \$100
RA 200	RL 0	RA 400	RL 0	RA 200	RL 0
	NW 100		NW 300		NW 150

Net Monetary Creditor

Before Inflation		After Inflation			
Assets	Liabilities	In Money Terms		In Real Terms	
		Assets	Liabilities	Assets	Liabilities
MA \$100	ML \$ 0	MA \$100	ML \$ 0	MA \$ 50	MA \$ 0
RA 200	RL 200	RA 400	RL 400	RA 200	RL 200
	NW 100		NW 100		NW 50

Neither Net Monetary Debtor Nor Creditor

Before Inflation		After Inflation			
Assets	Liabilities	In Money Terms		In Real Terms	
		Assets	Liabilities	Assets	Liabilities
MA \$200	ML \$200	MA \$200	ML \$200	MA \$100	ML \$100
RA 100	RL 0	RA 200	RL 0	RA 100	RL 0
	NW 100		NW 200		NW 100

MA=Monetary Asset  
 RA=Real Asset  
 ML=Monetary Liability  
 RL=Real Liability  
 NW=Net Wealth

Exhibit I shows the effect of inflation on three wealth holders. Before inflation the net wealth of each is \$100, as shown in the balance sheets to the left. The composition of wealth, however, differs among them. The first is a net monetary debtor; monetary liabilities exceed monetary assets. The second is a net monetary creditor; monetary assets exceed monetary liabilities. The third has equal amounts of monetary assets and monetary liabilities.

To the right of the exhibit are the after-inflation balance sheets of the three wealth holders. For purposes of illustration, inflation at a rate of 100 percent is viewed as a discrete event with the price level doubling in the period from  $P_0$  to  $P_1$  (that is,  $P_0=1.00$ ,  $P_1=2.00$ ). The after-inflation balance sheets are shown first in money terms, where real assets and real liabilities double when prices double while

monetary assets and liabilities remain unchanged. They are also shown in real terms, where monetary assets and liabilities have been deflated by the new price index ( $P_1$ ) while real assets and liabilities remain at their pre-inflation amounts.

The before- and after-inflation balance sheets show a decrease in real net wealth for the net monetary creditor, an increase for the net monetary debtor and no change for the one whose monetary assets equal monetary liabilities.<sup>19</sup>

It is important to regard the inflation in this illustration as unanticipated. A decline in the real net wealth of net monetary creditors means that the real yield on monetary assets after inflation turns out to be less than anticipated at the time of purchase. Expectations of prices rising at an accelerated rate in the future would motivate actions to offset the effect of inflation on net wealth.<sup>20</sup> For example, such expectations would lead a lender to request a higher interest payment to compensate him for the reduced purchasing power of the dollar expected by the time of

repayment. By the same token, expected increases in inflation would make a borrower more willing to pay a higher interest rate because the purchasing power of funds obtained at the time the loan is made is expected to be greater than the purchasing power of funds at the time the loan is repaid. In a market where interest rates are free to vary, a lower interest rate than that which would compensate the lender for inflation results from underanticipation of inflation.

This reasoning suggests that expectations about changes in the price level will affect market rates of

Wealth," *The Review of Economics and Statistics* (February 1974); Albert E. Burger, "The Effects of Inflation (1960-68)," this *Review* (November 1969), pp. 25-36; W. Lee Hoskins, "Inflation: Gainers and Losers," Federal Reserve Bank of Philadelphia *Business Review* (February 1970), pp. 23-30; Kessel and Alchian, "Effects of Inflation," pp. 521-37.

<sup>19</sup>It should be noted that in actuality not all real assets will rise in price at the same rate as the price level. Some real asset prices will rise faster, some slower. It also should be noted that debt incurred to increase current consumption does not lead to a rise in real net wealth with inflation. In the case that debt is incurred for the purchase of non-durable goods, the rise in monetary liabilities is offset by a decline in net wealth on the same side of the balance sheet. Current consumption might be viewed as increasing real net wealth to the extent that it increases the value of the consumer's human capital, but such an effect would be difficult to measure.

<sup>20</sup>Ceilings on interest payments by financial institutions and other interest rate controls limit the range of inflation-offsetting alternatives that monetary creditors can choose.

interest.<sup>21</sup> Expectations of a rise in the rate of inflation will lead to increased market interest rates. This is equivalent to a decline in the current exchange prices of outstanding monetary assets and liabilities.<sup>22</sup> Hence, expectations of increased inflation, as well as the occurrence of inflation, cause reductions in the purchasing power of existing monetary assets.

### *Inflation and the U.S. Government Debt*

The outstanding debt of the Federal Government is over \$480 billion. In addition, Federal agencies and trust funds, as of the third quarter of 1974, had an outstanding debt of \$137 billion. Most of the \$480 billion public debt has been incurred since 1941. About \$135 billion of this is held by U.S. Government agencies and trust funds; about \$80 billion is held by the Federal Reserve System; and about \$266 billion is held by private investors.

Inflation, to the extent it is underanticipated at the time securities are issued, reduces the amount of purchasing power which the Government must repay to holders of maturing securities. For example, the repayment in 1972 of \$1,000 on a maturing five-year note issued in 1967 would buy roughly what only \$805 would have bought in 1967.<sup>23</sup>

The Government's debt consists of securities issued at various times, for various maturities, and at various interest rates. We cannot tell precisely the degree to which the inflation we have had has been anticipated or the degree to which interest payments have compensated purchasers for losses in the purchasing power of their monetary asset due to subsequent inflation. Probably, however, much of the inflation has been unanticipated. We can observe, for example, that if a \$1,000 five-year note was purchased at par in 1967 to yield 5 percent per year<sup>24</sup> and held to maturity, interest receipts would have equalled \$50 per year or \$250 for the five years. Since, however, prices rose each year, each \$50 interest receipt would buy less than the previous one.

<sup>21</sup>A discussion of the effect of inflationary expectations on interest rates and numerous references are contained in William P. Yohe and Denis S. Karnosky, "Interest Rates and Price Level Changes, 1952-69," this *Review* (December 1969), pp. 18-38.

<sup>22</sup>The exchange price of a monetary asset is the price which it can command in the market currently. This can vary, whereas the dollar amount to be obtained at maturity remains fixed.

<sup>23</sup>Deflating by the GNP implicit price deflator.

<sup>24</sup>The average yield on three to five-year Government securities ranged between 4.5 and 5.5 percent during 1967.

Table II shows the continual decline in the purchasing power of the interest receipts compared to 1967.

Year	Interest Receipt	Purchasing Power in 1967 Dollars <sup>1</sup>
1968	\$ 50	\$ 48.08
1969	50	45.86
1970	50	43.48
1971	50	41.60
1972	50	40.24
	<u>\$250</u>	<u>\$219.26</u>

<sup>1</sup>Deflated by the GNP implicit price deflator.

Ignoring possible reinvestment of interest receipts, total interest payments in terms of 1967 purchasing power come to only \$219. With the \$195 loss in the purchasing power of the principal, offset by only a \$219 payment in real purchasing power for interest, the security holder received essentially nothing for allowing the Government to use his funds for five years.

The Government's commitment to redeem its securities and pay interest on them is a commitment to pay a fixed number of dollars. Unanticipated inflation reduces the amount of real resources embodied in this commitment. Hence, inflation captures, from those who purchased bonds, resources which otherwise either would not be available for Governmental use or distribution or would have to be financed with other taxes. These resources, thus captured, constitute an arbitrary transfer from, or "tax" on, the wealth of the bondholders.

### *The Inflation Tax on Money*

As mentioned earlier, inflation is the continuous erosion of the purchasing power of money. Those who continue to hold money as it decreases in purchasing power incur a loss. The loss is often described as a "tax" on money. The real value of money holdings is the tax base; the rate of inflation is the rate of tax; the product of the base and rate is the negative impact of inflation on the real wealth of the money holder.<sup>25</sup>

<sup>25</sup>Bailey, "Welfare Cost," p. 93; Phillip Cagan, *The Channels of Monetary Effects on Interest Rates* (New York: National Bureau of Economic Research, 1972), pp. 9-39, and "Monetary Dynamics," p. 78; Milton Friedman, "Government Revenue from Inflation," *The Journal of Political Economy* (July/August 1971), p. 846.

Consider an example of someone holding \$100 in the form of money. Assume that at the end of a year the \$100 will purchase a market basket of goods equal to only 9/10 of what it would have bought at the beginning of the year. This is the same as saying that the original basket costs \$111.11 at the end of the year, or that prices have risen by 11.1 percent, or that the original money holdings are worth only \$90 in purchasing power at the end of the year. The person holding the \$100 has paid a tax equal to 11.1 percent of that \$90. The rate of the tax is the rate of inflation (11.1 percent). The tax base is the real value of money balances (\$90). The tax payment, in real terms, is the product of the rate and base (\$10).

A general formula describing the tax payment from an inflation tax is:

$$\frac{M}{P_1} \times \frac{P_1 - P_0}{P_0}$$

where M is the amount of money held, P<sub>0</sub> is the initial price level, and P<sub>1</sub> is the price level after the inflation. In terms of the example in the previous paragraph where P<sub>0</sub>=1 and P<sub>1</sub>=1.11:

$$\frac{\$100}{1.11} \times \frac{1.11 - 1.00}{1.00} = \$90 \times .111 = \$10.$$

The decrease in purchasing power incurred by holders of money due to inflation imparts gains to the issuers of money if the rises in the price level are due to increases in the quantity of money. The increases in the price level reveal to some extent the real resources acquired by the issuers of money through the expansion of money.<sup>26</sup> In this case the inflation tax on money is an extension of the concept of seigniorage discussed earlier in the context of monetary expansion just sufficient to keep the price level stable.

Declines in the purchasing power of money due to declines in the real wealth of the community do not impart absolute gains to the issuers of money.<sup>27</sup> Nevertheless, to the extent that declines in real wealth are reflected in a rise in the price level, the declines are distributed in the community according to holdings of money.

<sup>26</sup>"Inflation can be deliberately utilized as a tax. A government can acquire resources by creating and spending new fiat money. This policy can cause prices to rise and it is this rise in prices that reveals the transfer of wealth to the government from money holders and reduces the wealth position of all (including government) creditors." [Kessel and Alchian, "Effects of Inflation," p. 525.]

<sup>27</sup>Ibid., p. 527.

## LIMITS TO THE EFFECTIVENESS OF MONETARY EXPANSION AND INFLATION AS SOURCES OF GOVERNMENT FUNDS

### Anticipation of Inflation

Once the public anticipates inflation, the gains in purchasing power the Government can derive from its ability to expand the money stock and issue debt become more limited. Anticipation of inflation leads to attempts by the public to economize on cash balances, and in the process they bid up prices of goods and services. The rise in prices reduces the real money stock which is the base of the inflation tax.<sup>28</sup>

A study of historical hyperinflations has shown that Government revenue from the inflationary finance was high at the beginning. However, as the experience of inflation was built into the expectations of the public and the public made adjustments on the basis of those expectations, real inflation tax revenues could

<sup>28</sup>The effect of anticipated inflation on the inflation tax base and revenues is described more completely elsewhere. For example:

A higher rate of anticipated inflation will produce larger tax proceeds per unit of real value of money balances held by a community, but it also reduces stocks of money balances in real terms. [Ibid., p. 531.]

and

The base of the tax is the level of real cash balances; the rate of the tax is the rate of depreciation in the real value of money, which is equal to the rate of rise in prices. Revenue (in real terms) from the tax is the product of the base and the rate,

$$\frac{M}{P} \left( \frac{dP}{dt} \frac{1}{P} \right)$$

The note-issuing authorities 'collect' all the revenue; however, when prices rise in greater proportion than the quantity of money, that is, when real cash balances decline, part of the revenue goes to reduce the real value of the outstanding money supply. Thus total revenue per period of time is the sum of two parts: first, the real value of new money issued per period of time,

$$\frac{dM}{dt} \frac{1}{P}$$

and, second, the reduction in outstanding monetary liabilities, equal to the decline per period of time in the real value of cash balances,

$$\frac{d \left( \frac{M}{P} \right)}{dt}$$

This is demonstrated by the following identity:

$$\frac{dM}{dt} \frac{1}{P} - \frac{d \left( \frac{M}{P} \right)}{dt} \equiv \frac{M}{P} \left( \frac{dP}{dt} \frac{1}{P} \right)$$

[Cagan, "Monetary Dynamics," p. 78.]

be increased only by even more rapid rates of money growth.

Rates were quickly reached, however, that completely disrupted the economy, and they could not be long continued. The attempt to enlarge the revenue in the closing months thus produced the characteristic pattern of the hyperinflations: price increases did not peter out; they exploded.<sup>29</sup>

Correct anticipation of inflation would also limit the opportunity of the Government to gain command over resources from inflationary policies through its status as a net monetary debtor. With anticipations of inflation, the public would buy securities only at a discount or at a yield which incorporated an inflation premium.

### *Tax Structure*

As noted in footnote 15 of this article, our tax structure tends to yield increases in income tax revenues at a rate faster than inflation. Offsetting this influence, but only slightly, is the effect of capital losses due to inflation. Capital losses reduce taxable income and are realized when securities are sold at a discount, compared to the purchase price, due to an increase in the actual or anticipated rate of inflation.

### *Competition in the Issue of Money*

Competition in the issue of money transfers gains from money creation to the holders of money, while issuers continue to earn a return sufficient to remain in business.

In the United States, institutional constraints limit the ability of private institutions to compete with the Government in the issue of money, but they do not eliminate it entirely. Commercial banks issue demand deposits on the basis of reserves which essentially are issued by the Government. Hence the gains to the

Government from the issue of money are in relation to the total of bank reserves<sup>30</sup> and currency in the hands of the public, that is high-powered money, while the money stock consists of the larger total — currency plus demand deposits in the hands of the public.

### **SUMMARY**

Increases in the money stock, under institutional arrangements for monetary expansion in the United States and elsewhere, provide, in the first instance, purchasing power for the issuer of money — primarily the Government. Monetary expansion, whether accompanied by actual rises in the price level or not, taxes the wealth of money holders by making the purchasing power of their money holdings less than it would be in the absence of the expansion or under an arrangement where money holders reaped all the gains from a larger stock of money services.

In addition, unanticipated price rises reduce the real value of monetary assets and liabilities and thus transfer wealth from net monetary creditors to net monetary debtors. The decrease in the real value of the Government debt due to inflation is a transfer of wealth from bondholders and money holders to taxpayers and to beneficiaries of Government spending programs. Correct anticipation of inflation would tend to reduce these transfers. In addition, changes in institutional arrangements, such as removal of the prohibition of interest payments on demand deposits, and indexation of income taxes and security prices would reduce the contributions of monetary expansion and inflation to Government finance.

Monetary expansion and inflation, like income and other taxes, redistribute purchasing power from the private sector to the public sector and among members of the private sector. Unlike other taxes, however, they are not legislated specifically, but come about primarily as the result of actions of the monetary authorities.

<sup>30</sup>Reserves of commercial banks that are members of the Federal Reserve.

<sup>29</sup>Cagan, "Monetary Dynamics," p. 80. See also: Milton Friedman, "Monetary Policy in Developing Countries," *Nations and Households in Economic Growth: Essays in Honor of Moses Abramovitz*, ed. Paul A. David and Melvin W. Reder (New York: Academic Press, 1974), pp. 272-76; Friedman, "Government Revenue;" and Bailey, "Welfare Cost," p. 101.

