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Problems of Inflation and High Interest Rates

John J. Balles, President
Federal Reserve Bank of San Francisco
Testimony before House Committee
on Banking and Currency
Washington, D.C., July 17, 1974

Mr. Chairman, I appreciate this opportunity to share my thoughts on basic monetary problems with this Committee. I will attempt to set forth and analyze what I believe are the major issues and the appropriate policies to deal with them. In that context, I will deal with the questions you raised in your letter of June 19.^{1*}

As you pointed out in calling these hearings, two of the most serious problems currently facing the U.S. economy are an unprecedented rate of peace-time inflation and a record high level of interest rates. The present inflation is especially pernicious because many of the largest price increases have been for necessities such as food, housing and fuels, so that the poor and those living on reduced retirement income have been the hardest hit. Such perverse effects of inflation tend to negate the attempts of the government in recent years to assist such groups with direct government programs. Similarly, it is clear that the current high level of interest rates has created serious dislocations and strains in our economy. These include the adverse impact on the housing market, the large capital losses to those persons in all walks of life who have put their savings into stocks and bonds, directly or through mutual funds and pension trusts, and the threat to the liquidity of financial institutions.

World-wide problem

As you are aware, the problems of rampant inflation and extremely high interest rates are not restricted to the United States. All of the major industrial countries are experiencing similar, or even higher rates of inflation, and the high interest rates which go with these rates of inflation. A significant share of our current inflation results from the fact that the prices of many basic goods—such as oil, wheat, cotton, and lumber—are determined in the international market place, rather than in the U.S. market alone. Thus, worldwide inflation acts to exacerbate and complicate our domestic inflation problem. For similar reasons, the resolution of our current inflation and high interest rate problems does not lie completely within our hands, but rather requires the cooperation of the major industrial countries of the world.

What has led to this unprecedented world-wide inflation? Some observers would cite excessive monetary and fiscal expansion as the major immediate cause. But since I do not believe that governments and central banks act out of blind ignorance or perverse motives, we must consider the social and political climate which tends to produce a bias toward inflationary policies. One major factor appears to be the increasing pressure on the world's available resources which has been created by a growing and more affluent population with ever-rising

*Footnotes at end of article.

expectations for a higher standard of living. Another key factor appears to be the increased priority that governments have assigned to achieving a fully employed economy, both here and abroad, since World War II. Given this priority, governments have committed themselves to ongoing, expansionary domestic policies to prevent "unacceptable" levels of unemployment from developing. These secular developments have tended to create an underlying inflationary bias in government policies throughout the world.

The cultural and economic forces generated over the past three decades have provided the basis for our present inflationary experience, but they do not explain why serious worldwide inflation occurred in the first half of the 1970's, rather than the second half of the 1960's, or at some other period. The reasons for the timing of our problems are complex. However, one element which has not received as much attention as it deserves is the breakdown of the Bretton Woods System, and the decline in recent years in foreign confidence in the U.S. dollar. In the years from the end of World War II until the mid-1960's, the world looked on the U.S. as the strongest and most stable country, and the dollar as the strongest and most stable currency. As a result, both foreign governments and private persons tended to accumulate dollar assets. But as the U.S. suffered an almost unbroken string of deficits in our balance of payments, and as the U.S. inflation rate gradually accelerated in the late 1960's towards 6 percent, confidence in the dollar weakened, and there was an incentive to switch out of dollars into other currencies.

This movement out of dollars accelerated in the period after the U.S. suspended convertibility of the dollar into gold in August, 1971. The movement only came to a halt in March 1973, when most industrial countries floated their exchange rates, and thereby rang down the curtain on the Bretton Woods system of fixed-exchange rates.² In the period up to March 1973, foreign governments resisted an appreciation in value of their own currencies *vis-a-vis* the dollar because they believed that it would hurt their export industries, slow their growth, and create

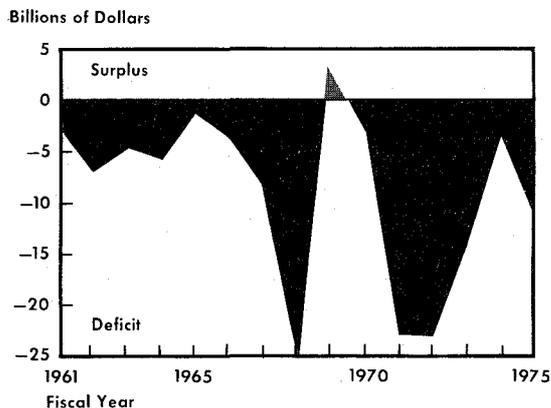
domestic unemployment. The consequent intervention in foreign-exchange markets by other governments substantially increased the domestic money supply in these countries as they bought dollars by issuing their own money through central bank operations. Thus the well-publicized dollar overhang was matched by foreign monetary expansion. Simultaneous monetary expansion in all major industrial countries helped to foster a simultaneous business-cycle boom around the world, which aggravated the inflation from which we all now are suffering.

Having noted the worldwide inflationary climate, I would now like to turn to a more specific analysis of the underlying factors that have produced rampant inflation in the United States, even in the face of a softening in economic activity. It may be helpful to put this problem in historical perspective, before attempting to assess possible cures.

Effect of budget deficits

Our domestic inflation problem owes much to the fact that the Federal Government in the United States has run deficits in 14 of the last 15 fiscal years. These deficits, which occurred in all phases of the business cycle, have ex-

Inflation problem reflects continued deficit spending, especially in recent years



panded the Federal debt by \$193 billion, or 67 percent since 1959. Federal deficits became an especially critical problem with the major escalation of the Vietnam war in mid-1965. The size of these deficits increased at an alarming rate during the Vietnam build-up period between 1966 and 1968 when the economy was at, or near, full employment. The fiscal situation was temporarily relieved by the belated income-tax surcharge in mid-1968, and by a leveling off in military expenditures at about the same time. However, the situation deteriorated further in 1969-70 when outlays for civilian programs outstripped recession-reduced revenues, and became still worse in the 1971-73 period when a full-blown expansion got underway.

It can be argued that a tighter monetary policy ought to have been able to offset the inflationary effects of this large, sustained deficit financing. In theory this may be true, but in practice the opposite has tended to occur. When huge Federal credit demands are added to those of a fully-employed private sector, interest rates tend to rise sharply. There are some sectors of the economy, such as housing construction, and programs financed with municipal bonds, that are especially sensitive to such a development because they depend heavily upon long-term credit. Because high interest rates have an uneven impact on the economy, demands for relief are quickly heard. For example, in the spring of 1973, there was a serious effort made by some members of Congress to freeze interest rates, or even to roll them back to the level of January 1, 1973.

In short, large-scale deficit financing by the Government tends to bring great pressures on the central bank to keep interest rates from rising to "unreasonable," "unacceptable," or "dangerous" levels. Unfortunately, the only way the mounting credit demands can be satisfied without an increase in interest rates in the short run is for the Federal Reserve to accelerate the growth of money and credit. But if done for too long, or to an excessive degree, such action can generate inflationary pressures which may persist for a long period of time and result in even higher interest rates in the long run.

It has been my observation that large and persistent Federal deficits are a major factor in pulling monetary policy off course, in the direction of excessive monetary expansion, as the central bank attempts to cope with the conflicting pressures that develop. Too often in practice, therefore, an expansionary fiscal policy tends to generate excessive expansion in money and credit.

Priority of employment goal

The second major factor tending to inhibit the use of monetary policy in combatting inflation is the conflict in national goals that often occurs as between "full employment" and stable prices. Since the early 1960's, the "full employment" goal in the U.S. generally has contemplated an unemployment rate of 4 percent or less. Such a rate was regarded by many as a practical minimum, in view of the normal shifting of workers between jobs and the lack of marketable skills of some job-seekers. Whenever the conventional or aggregate unemployment rate has exceeded 4 percent, pressures have developed for expansionary monetary and fiscal policies. For example, recently there have been demands for a tax cut to take up slack in the economy and to reduce our conventional or aggregate unemployment rate from the 5.2 percent level that prevailed last month. Were such policies to be undertaken, I greatly fear that they would simply accelerate the already extremely high inflation rate in the U.S.

In my view, there has not been enough policy use of a refined analysis of the employment and unemployment data, concentrating on the "hard core" of our labor force—i.e., heads of households or "breadwinners"—for whom the social and economic costs of unemployment are the highest. Among this group, the unemployment rate last month was only 3.1 percent, in contrast to the conventional or aggregate unemployment rate of 5.2 percent.

The significance of a 4 percent aggregate unemployment rate has gradually changed over time because of shifts in the composition of the labor force. An earlier study by George Perry of

the Brookings Institution,³ and a more recent study by Eckstein and Brimmer for the Joint Economics Committee⁴ suggest that a 4 percent unemployment rate today represents a much tighter labor market than it did twenty years ago, in view of the increased participation in the labor market by teenagers and other new entrants who also lack marketable skills. Generally, it now seems to take a higher rate of inflation to achieve a 4 percent unemployment rate than it did some years ago, because of those factors. Thus if we should now attempt to follow a monetary policy aimed at reducing unemployment to 4 percent, the likely consequence would be to exacerbate present inflationary pressures, which have already reached dangerous levels.

This, of course, is not to imply that monetary and fiscal policy should never be used to help deal with unemployment. What it does mean is that, because of shifts in structure of the labor force, there may be a change over time in the practical minimum unemployment target that can be achieved through expansionary monetary and fiscal policies without creating an unacceptable rate of inflation. Thus, some knowledgeable observers would hold that, because of the shift in the composition of the labor force already noted, the practical minimum target today might be about 4½-5 percent as far as measures to stimulate aggregate demand through monetary and fiscal policy are concerned.

In these circumstances, a very useful way to fight unemployment is to attack the structural source of the problem by helping to increase the marketable skills of those groups who lack experience. Such measures as low-interest education loans to youth and minority groups, retraining programs directed toward skills where job vacancies are high, and steps to facilitate worker mobility are all important in this context. Rather than imposing inflation on everyone by attempting to reach our employment goals through expansionary monetary and fiscal policies, our aim should be a much more vigorous use of selective means to deal with these specific problems. We need a high-powered rifle shot approach, rather than the shotgun approach of monetary and fiscal policy.

For whatever reason, there has been a tendency for the goal of "full employment" to take priority over stable prices, in view of actions in recent years by the Administration and Congress—whose job it is to determine national priorities. Not enough attention seems to have been paid to the trade-off—i.e., the additional inflation that must be accepted to get a lower unemployment rate. In essence, my argument is that we have had both a faulty diagnosis, and in part the wrong medicine, for the unemployment goal. First we need a more meaningful "target rate" for unemployment, as I have explained. Secondly, we need new perceptions and new remedies for structural unemployment, particularly among teenagers, minority groups and part-time women workers.

Lags in monetary policy impact

A third major factor which tends to inhibit the use of monetary policy in combatting inflation, and which results in calls for its use to provide short-term stimulus to the economy, is a complicated technical one. Namely, the lags in the effects of a change in monetary policy seem to be shorter for production, employment and profits than for prices. Admittedly, our knowledge about the length of those lags is imperfect. But it is reasonably clear that the "good news" from easy money appears first, with production, employment, and profits expanding within, perhaps, 6 to 12 months. However, the "bad news" comes later, in the form of increased inflation with a lag of perhaps 1 to 3 years. Conversely, if a tight money policy is adopted, the bad news of a dampening economic activity comes first, whereas the good news of a diminished rate of inflation is delayed. In these circumstances, it is not surprising that elected officials who must face the voters at regular intervals tend to prefer an easy money policy.

Monetary policy too expansive

Thus, it may be asked, has monetary policy been a principal cause of our inflation problem,

with the accompanying high level of interest rates, and could this have been avoided if monetary policy had been tighter in recent years? In testimony earlier this year before the Congress, Chairman Burns acknowledged that, with the benefit of hindsight, monetary policy may have been overly expansive in 1972. Some of our critics, such as Professor Milton Friedman, would go much further—alleging that the money supply has grown too fast since about 1970, and that this played a major role in producing the current inflation.

Such criticism, whether or not fully justified, is easy enough to make, based both on monetary theory and statistical studies, but it seems to me to ignore real problems in the real world. No central bank can be or should be wholly independent of government. The elected representatives of the people of the United States, both the Congress and the Administration, must have the ultimate responsibility for economic policy. The Federal Reserve System must take account of the high priority which the Congress and the Administration have assigned to full employment and economic growth, which has often conflicted with stable prices. Central banks cannot completely ignore such imperatives—even against their better judgment. It is vital that this matter be thoroughly appreciated, not only by the Congress and the Administration, but also by the business and financial community and the general public. It is only in this way that we can get support for the belt-tightening measures needed to overcome the corrosive problem of rampant inflation and sky-high interest rates.

Inflation and financial markets

Having dealt at length with “what went wrong,” I would next like to deal with the pressing question of “where do we go from here.” Specifically, I will attempt to assess the consequences of severe inflation for the economy and financial markets and the policy options available to deal with these problems. But first, I must emphasize the crucial role which inflation plays in causing high interest rates.

Interest rates, as the price of money, are determined by the supply and demand for funds, which in turn are critically influenced by inflation expectations. On the supply side, in a period of inflation lenders will expect an interest premium to compensate for the erosion by inflation of the value of their assets. On the demand side, the need for funds in a period of inflation is boosted by rising prices of new plant equipment, inventories and consumer goods. Additionally, expectation that repayment will be in depreciated dollars will also add to demand for credit. The resultant heavy credit demands push rates even higher.

It is crucial to realize that the sharp escalation of interest rates in the first half of 1974 has occurred despite a continued growth in the money supply at a rate which some of our critics fear is still too large to be non-inflationary. According to latest estimates, the narrowly-defined money supply (M 1) rose at an annual rate of 7.0 percent in the first six months of 1974. Thus, the extremely high level of interest rates has stemmed principally from forces set in motion by inflation itself—i.e., by an inflation premium in interest rates and the way in which inflation magnifies credit needs.

In a very real sense, the double-digit inflation and accompanying high interest rates from which we are now suffering reflect inflationary policies of the past, the symptoms of which were temporarily suppressed during the period August 1971 to early 1973 by wage and price controls under various programs. Unfortunately, the inflationary process is not quickly reversible, and it will probably require several years to reduce the rate of inflation, and hence interest rates, to more reasonable levels. If sole reliance continues to be placed on monetary policy to do the job, unaided by fiscal restraint, it may take even longer. It is vital to recognize that rampant inflation cannot be brought under control without sustained monetary and fiscal restraint, in the U.S. or any other country. I believe that this conviction is shared by most economists of all schools of thought. Thus, the great challenge that we face in the process of licking inflation is to design the best measures to restrain demand and to increase supplies.

High and rising interest rates have taken their toll on financial markets. To the man in the street, some of the most obvious results have been the decline in the stock market and the sharply reduced supply of funds for home loans at savings institutions. These institutions have endured heavy withdrawals of funds, as depositors placed their funds in higher yielding market instruments, and the consequence has been a major curtailment of funds to the housing industry. To the man on Wall Street, the dangers have been just as ominous. For example, public utilities have experienced serious difficulties in raising money in the capital market, and the commercial banks have had increasing problems in raising funds to meet heavy loan demands.

The market disruptions caused by high interest rates, in turn, have seriously affected the real economy. Those who have invested in stocks and bonds, directly or through mutual funds and pension trusts, have suffered substantial capital losses, and have become poor sales prospects for new homes, new cars and other big-ticket items. And higher borrowing costs generally have contributed to higher prices of most goods and services.

One may certainly ask whether we must put up with such severe dislocations in the financial markets and the overall economy. Unfortunately, the answer to this question appears to be yes. A policy specifically aimed at reducing interest rates now would require massive injections of reserves into the banking system by the Federal Reserve and an acceleration in the growth of money and credit. The result might be a temporary levelling off or decline in interest rates, and a short-run rise in output. But in the longer run, this policy would cause an even sharper rise in prices, which in turn would cause interest rates to rise even higher.

Since high interest rates have had such painful consequences, it is pertinent to ask whether they have done any good in moving toward a solution to the inflation problem. I see mounting indications that the high cost of credit is having the desired rationing effect, both from the standpoint of borrowers and lenders, in

“cooling off” the economy. This is a necessary first step in purging the economy of inflationary excesses and starting on the long road back toward stable and non-inflationary growth.

Policy recommendations

What can policymakers do to extricate the economy from the present situation of surging inflation and high interest rates? I believe that several major lessons are implicit in what I have already said about the dangers of inflation and of unbalanced policy responses. However, these lessons can be summarized in the following four specific policy recommendations.

1. Longer-term policy horizons. Both with regard to monetary and fiscal policy, I suggest that we explicitly recognize the lagged effects of policy measures, and work within somewhat longer time horizons than has been the custom in the past. In our present uphill battle against inflation, we should expand our policy-planning horizons to at least three years to measure the effect of policy actions being taken currently. A planning horizon which does not capture the full consequences of current policy actions, especially with regard to prices, necessarily has an inflationary basis.

2. Budget reform. I applaud Congress' efforts this year in moving toward budget reform. By setting up new machinery that will deal with the budget as a single entity, you are in effect creating a vested interest devoted to the cause of economic stabilization. For the first time, Congress will be able to vote on fiscal policy. But beyond that, it seems essential to push for actual budgets which are restrictive in periods of severe inflation. The best fiscal policy for fiscal 1975 would be at least a balanced budget, or preferably a surplus, instead of the \$11.4 billion deficit currently projected. In my judgment, this is the most important single step that the Congress could take to relieve inflationary pressures and to reduce the level of interest rates. Up to the present, far too great a burden has been placed on monetary policy, with the anti-inflation effort centered around credit controls and the resulting high price of credit.

3. **Economic priorities.** I would recommend an amendment to the Employment Act of 1946, stating explicitly that price stability is a co-equal goal of economic policy, along with "maximum employment, production, and purchasing power." Further, I would suggest making explicit in policy decisions the implicit trade-off between full employment and stable prices whenever a conflict arises between these two goals. In the past, our laudable emphasis on the full-employment goal has caused us to downplay other necessary objectives, with the results we see today.

4. **Monetary policy.** If we are to overcome inflation, the Federal Reserve System must have Congressional and Administration support in pursuing a non-inflationary growth target for money and credit—even if high interest rates and some increase in unemployment are necessary in the short run, as inflationary forces are wrung out of the economy. It is particularly vital that we not be pulled off course toward excessive credit ease by the two major forces that have done so in the past—i.e., the necessity to finance large-scale budget deficits, and the tendency to call for easy money to solve structural unemployment problems that could be handled better through selective measures of the type I've described.

Concluding comments

My testimony, Mr. Chairman, has attempted to deal with the broad problems raised in your letter of June 19. Now I would like to conclude with a brief recapitulation directed specifically toward the six issues noted in that letter that involve some dispute in monetary economics. While recognizing that there are differences of opinion on these matters, both within and without the Federal Reserve System, my own views are summarized below.

1. **The reliability of the trade-off between inflation and unemployment as a guide for monetary policy.**

The trade-off between inflation and unemployment seems to be unstable and

subject to change. In recent years, it appears that the trade-off has worsened—i.e., it now takes more inflation to produce a given decline in unemployment. Even with the recent 11.5 percent inflation rate, the unemployment rate last month was 5.2 percent. Moreover, the trade-off appears to be a short-run phenomenon. In the long run, say, three years or more, a higher inflation rate will not "buy" a lower unemployment rate. Only in the short run of one to two years will we possibly observe a higher rate of inflation leading to a temporary decline in unemployment. This observation follows from the widely accepted doctrine that in the long run the growth in the money supply affects only the general price level, while in the short run the principal effects are on production and employment.

2. **Benefits and risks involved in the Federal Reserve accommodating non-recurring price increases originating in supply shortfalls and other special events.**

It is my view that the Federal Reserve should seldom, if ever, accommodate price increases originating from supply shortfalls and other transitory events. This will do nothing to ease the supply problem, and by facilitating higher prices, it will contribute to a higher permanent rate of inflation. As Chairman Burns said last winter, we recently have had a shortage of oil, not a shortage of money, and we cannot increase the supply of the former by increasing the supply of the latter.

3. **The benefits and risks involved in monetizing deficit spending.**

As I indicated earlier, it is undesirable for the Federal Reserve to monetize the deficits of the Federal Government in periods of full or nearly-full utilization of resources. At such times, the monetization of Federal deficits tends to pull monetary policy off course toward excessive monetary expansion, and thus contributes to inflation. In periods of recession, on the other hand, it is appropriate and benefi-

cial to monetize Federal deficits as part of a program aimed at recovery. Unfortunately, Federal budget deficits (as measured by the unified budget) have occurred in 14 of the last 15 years, irrespective of the state of the business cycle. There have been a number of important technical reforms in recent years, such as the auctioning of Treasury securities, which have reduced the Federal Reserve's role in support of the debt management area. However, the fundamental solution to the problem lies in keeping spending in line with receipts, thereby eliminating the deficits when they are not needed to bolster a sagging economy.

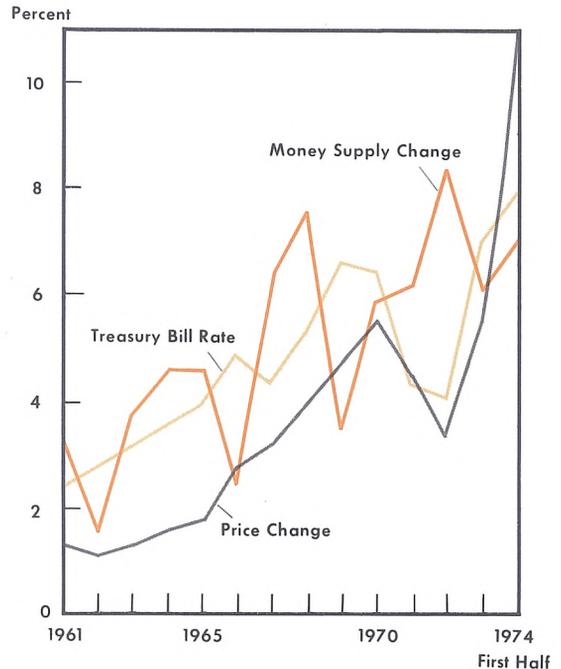
4. **The benefits and risks involved in the Federal Reserve fighting money market fires.**

A primary function of any central bank is to act as the lender of last resort to protect the institutional integrity of the financial system. In this sense the Federal Reserve must "fight money market fires." Many scholars believe that a serious aggravating factor in the Great Depression was the Federal Reserve's failure to perform this function in an aggressive way. In my opinion, the Fed has done a creditable job in protecting the institutional integrity of financial markets in recent decades during periods of liquidity crises, without letting the money supply get out of control on the upside.

5. **Relationships between money supply, inflation and interest rates.**

The rate of growth in the money supply is a major influence determining the level of interest rates in both the short run of a few months, and in the long run of a few years. However, the nature of this influence is quite different in these two time periods, because of the role of inflation in these relationships. In the short run, accelerated money growth can force interest rates down, and restricted money growth can force interest rates up, by altering the short-run supply of funds relative to de-

High interest rates reflect price inflation, and in turn high rate of money growth



mand for these funds. However, short-run changes in money growth have little if any direct effects on the overall rate of inflation. In the long run, sustained changes in the rate of growth in the money supply are a major determinant of the rate of inflation, and expectations of future inflation rates. Since current rates of inflation and inflation expectations are major determinants of the current level of interest rates, sustained changes in the rate of money growth will have a major effect on the level of interest rates. The lesson here is that efforts to reduce interest rates by accelerating money growth in the short run will be self-defeating in the long run. Thus, excessive easy money over a period of several years leads to inflation, which is a major factor producing high interest rates.

6. How to use monetary policy to check inflation and to bring interest rates back down to reasonable levels.

Monetary policy can check inflation and bring interest rates back down to reasonable levels through a gradual but steady policy of reducing the rate of mon-

etary expansion to a non-inflationary growth track. But to make this a viable approach, we will need a powerful assist from a policy of fiscal restraint, along with support for making stable prices a goal of equal importance with economic growth and full employment.

1. "(1) the reliability of the trade-off between inflation and unemployment as a guide for monetary policy; (2) the benefits and risks involved in the Federal Reserve accommodating non-recurring price increases originating in supply shortfalls and other special events; (3) the positive elements and the risks involved in monetizing deficit spending; (4) the benefits and risks involved in the Federal Reserve's fighting money market fires; (5) the relationships between money supply, inflation, and interest rates; (6) how to use monetary policy to check inflation and bring interest rates back down to reasonable levels."

Wright Patman letter of June 19, 1974 to John J. Balles

2. "How Well Are Fluctuating Exchange Rates Working," Report of the Subcommittee on International Economics of the Joint Committee, 93rd Congress, 1st Session (Washington, D.C.: U.S. Government Printing Office), August 14, 1972.

3. George L. Perry, "Changing Labor Markets and Inflation," Brookings Papers on Economic Activities, No. 3, 1970.

4. "The Inflation Process in the United States." Study prepared for the use of the Joint Economic Committee by Otto Eckstein and Roger Brimmer, (Washington, D.C.: Government Printing Office), February 22, 1972.

The Relation Between Income Growth and Unemployment

By Larry Butler

On an optimistic-realistic view, the best hope [for the 1970's] is that a 4 percent rate of unemployment and a 2 percent rate of price increase will prove compatible and that such a combination will be regarded as a satisfactory compromise by the American public. This was the hope before the Vietnam spurt in mid-1965, and nothing that has happened since demonstrates that it is unattainable.^{1}*

These words, dating from late 1969, are those of Arthur Okun, one of the principal architects of the Federal government's economic policy in the 1960's. His "best hope" may be taken as the consensus view in 1969 among economists of what the 1970's might bring. And in fact, neither number was wildly out of line with postwar experience up to that point; from 1947 through 1969, the unemployment rate averaged 4.6 percent and inflation proceeded at an average rate of 2.6 percent.

Nor was there good reason on the surface to believe that the targets of 4-percent unemployment and 2-percent inflation were incompatible. The two serious inflations of the postwar period—those associated with the Korean and the Vietnam wars—were accompanied by unemployment well below 4 percent, at a 3.1-percent average in 1951-53 and at a 3.6-percent average in 1967-69. In addition, there were two peacetime periods when policy brought unemployment near 4 percent—1955-

57 with average unemployment of 4.3 percent and 1965 with an average of 4.5 percent—and both were associated with inflation near 2 percent. It is now clear, however, that either something was wrong with Okun's analysis or that the economy has changed dramatically in recent years: from 1970 through 1973, unemployment averaged 5.3 percent, and inflation averaged 4.7 percent.

Underlying this discussion is the relation known as Okun's Law, which in its most general form states that there is a highly stable, predictable relation between the unemployment rate and the rate of growth of real income. Okun's development of this concept led to his construction of two of the best-known tools of fiscal and monetary analysis—potential GNP and the high-employment Federal budget. The measures, in the form which came into common use in the mid- and late-1960's, measure GNP and the Federal deficit, not as they are, but as they would be if the unemployment rate were at 4 percent.

Okun's estimate was that on the basis of the historical growth in the labor force, capital stock and productivity, an annual rate of growth of real income of approximately 4 percent would produce a constant unemployment rate.² He also estimated that each 1.0 percent of growth above the 4-percent figure would, on a quarterly basis, reduce the unemployment rate by .08 percent. Thus, 5 percent real growth, sustained for a full year, would lower

*Footnotes at end of article.

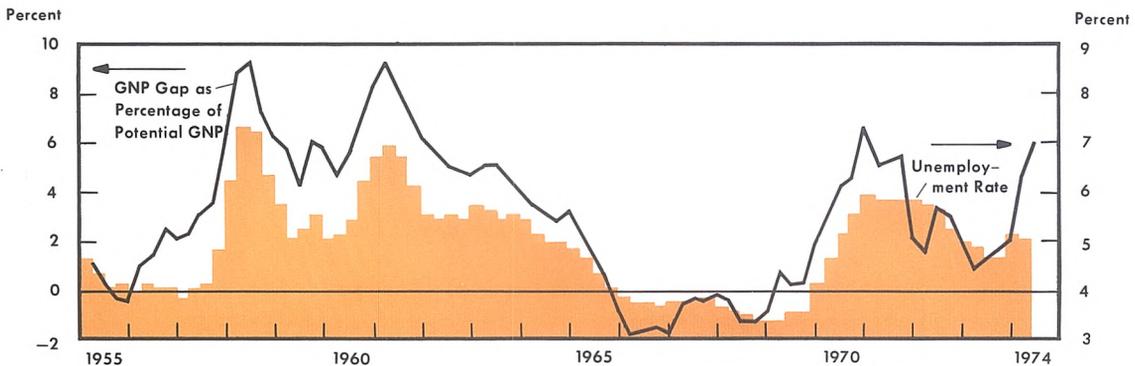
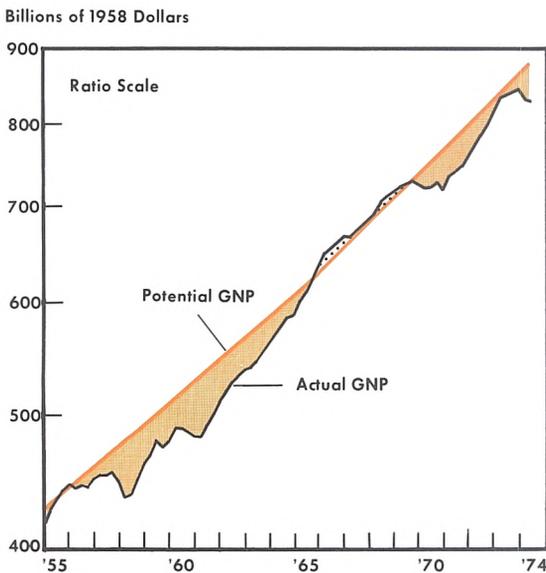
unemployment by 0.3 percent. With these two numbers, it is easy to compute the added real income at each point in time which is needed to produce 4 percent of unemployment. This added income, which has also been used widely in fiscal and monetary analysis, is called the GNP gap. The high quality of the relation between the gap and unemployment is apparent from the chart, which presents the observed relation between potential and actual output and unemployment (Chart 1).

Natural rate of unemployment

The bottom panel in the chart makes it clear that the computation of potential GNP based on 4-percent unemployment is arbitrary. The quality of the fit to observed unemployment would be unchanged if the line for zero gap were shifted up or down to a different level of full employment. This is so because the GNP gap approach essentially reflects only supply conditions: an added unit of labor in this world always generates and requires added growth in real income. There is no connection with the related demand notion that high demand for labor should also push wages up relative to other prices and thus automatically lower that demand. That this world cannot always be so may be seen by taking the case—which occurred in both the Korean and Vietnam wars—where neither added labor nor added capital were to be had. Any attempt to increase output must fail; if aggregate monetary or fiscal policy were used to this end, the effect would simply be to increase prices.

The necessary addition to the discussion is provided by Milton Friedman's concept of the natural rate of unemployment. Friedman observes that the unemployment rate is basically a measure of the degree of tightness in labor markets, and hence the amount of pressure on wage rates. At each point in time there will be one unemployment rate—the natural rate—which involves *no change* in the amount of wage pressure on the rate of price inflation. The rate of increase in wages at the natural rate will just equal the rate of growth of productivity

Chart 1



plus the rate of inflation expected by participants in the labor market. Gearing policy to any unemployment rate lower than the natural rate will cause problems, for the resultant wage pressure on prices will eventually mean that the inflation rate will go up, and will require a further wage rate increase to offset the new inflation rate. Thus the inflation rate could increase without limit, unless the authorities decide at some point to pursue policies which raise unemployment to at least the natural rate.

This point is illustrated by Chart 2, which depicts the familiar Phillips curve trade-off between the growth in wages and the unemployment rate. The natural-rate analysis permits us to say that changes in the expected rate of inflation shift the short-run trade-off up or down. In the chart, an increase in the rate of expected inflation from pe_1 to pe_2 increases the rate of increase of wages associated with any unemployment rate by the same amount—the natural unemployment rate, associated with no change in the amount of wage pressure on the inflation rate.

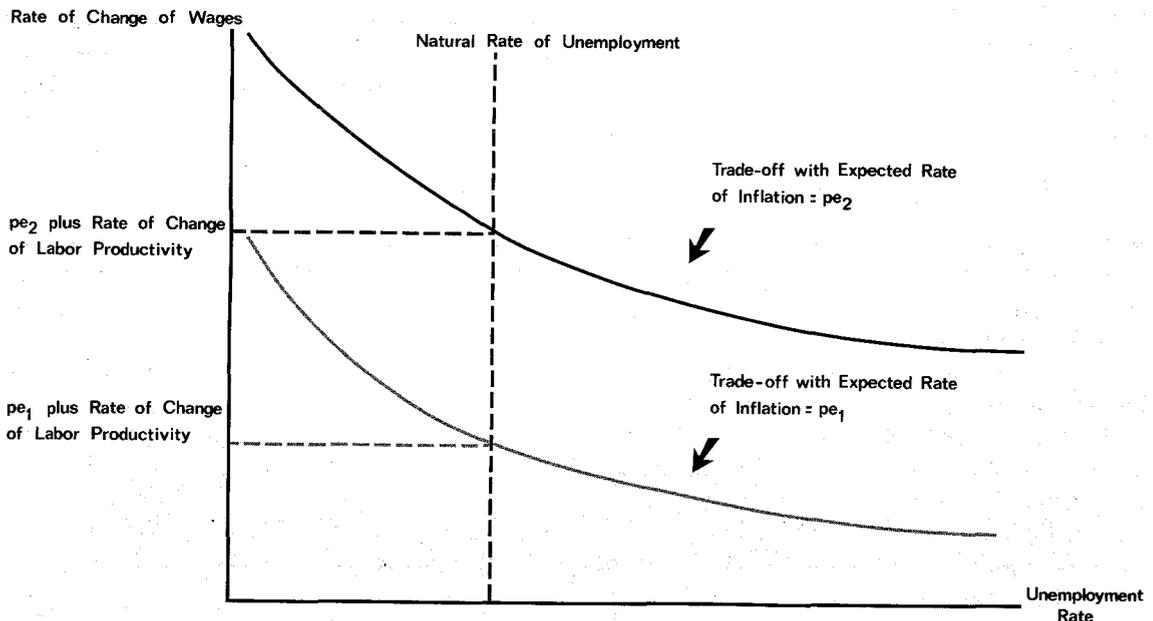
The main requirement for the existence of a natural rate is that changes in prices operate independently of the real economy; that is, that

an increase in wage pressure on prices will eventually be fully reflected in the price level but will have no effect on the level of real income. This assertion is natural in economics because of the usual assumption that people are not subject to “money illusion”: at least in the long run, workers and businesses respond to shifts in real (and not in money) wages and assess their welfare accordingly. Thus Friedman’s approach would suggest that potential income should *only* be computed with reference to the natural rate. Use of any other rate would imply that the calculation is not neutral to inflation, that it embodies some amount of misallocation due to changes in inflation.

It is the purpose of this article to measure the natural rate of unemployment implicit in Okun’s Law and examine the relation for changes over time. It will be shown that, except for the effect of temporary conditions:

1. The natural rate of unemployment has remained unchanged at 4.8 percent during the post-war period;
2. The growth rate of potential income has increased from 3.5 percent before 1956 to 4 percent since 1965; and

Chart 2



3. The relation between income growth and unemployment has changed in a way which makes it much less likely that high income growth will produce very low unemployment rates (below 4 percent) than was the case in the early post-war period.

Okun's Law and the natural rate

There is no reason in principle for either Okun's Law or the natural rate of unemployment to be particularly stable over time. Both depend on a number of factors which can shift over time. For example, with respect to Okun's Law relating the growth in potential GNP to the growth of the input of capital and labor, the growth rate of the civilian labor force is far from constant, and is influenced by such items as the number of young persons entering the labor force and the number of women entering or reentering the labor force, both matters largely beyond the scope of economics. But it may well be that all such influences are transitory, and that a simple correction for them will produce relations which are indeed very stable. Such is the case for Okun's Law, at least for the period from the end of World War II through the mid-60's, the period studied by Okun and his followers. There is also some evidence, provided by Friedman in the form of an examination of the relation between inflation and unemployment, that the natural rate of unemployment was also largely unchanged in the same period.

Whether this stability remains in the 1970's is a question of some importance for policy making, because Okun's Law and the natural rate both bear directly on the major social concerns of policy—the high social cost of unemployment and the misallocation of resources implicit in inflation. We will examine this stability with the aid of a minor extension of the basic Okun model to allow for a measure of the natural rate of unemployment. The Okun model makes the change in the unemployment rate ΔU_t at time t equal some number a (the *income multiplier*) times the difference between the rate of growth of real income YR_t and its

potential rate of growth g :³

$$(1) \quad \Delta U_t = -a(YR_t - g)$$

If we sum all quarterly changes in unemployment from 1 to time t , and add the level of the unemployment rate U_0 at time zero, we obtain the *level* of the unemployment rate U_t at time t as a function of the *sum* YS_t over all past rates of income growth and a time trend. This last term arises because a sum over a constant growth rate g will increase by just one unit of growth per quarter:

$$(2) \quad U_t = U_0 - a(YS_t - gt)$$

Two other items must be taken into account before fitting the equation. First, there is no logic that requires all of the effects of a certain level of income growth to occur in the present quarter. Our investigation of this point showed that the best statistical results would be obtained if we used instead a simple average of the current and just-past values for the change in real income. We replace the YS_t term in equation (2) with:

$$YA_t = (YS_t + YS_{t-1})/2$$

Secondly, the relation will be subject to a variety of temporary elements, and there must be a correction for such disturbances in the relation if our estimates are to be accurate. A simple correction is to allow the unemployment rate to depend on the observed error e_{t-1} in the relation last quarter times a correction factor p_p as well as on the other, more basic, variables. What this dependence means is that if the basic projection was high last quarter, it will be high again this quarter because the transitory forces which caused the high projection will not yet be completely spent. These additions yield the final form of the relation:

$$U_t = U_0 - a(YA_t - gt) + pe_{t-1}$$

U_t is the overall unemployment rate
 U_0 is the equilibrium unemployment rate in 1948

a is the income multiplier

YA_t is a two-quarter moving average of the sum over all annual rates of growth since 1948

g is the growth rate of potential income

pe_{t-1} is a correction factor times the error in the relation in the previous quarter.

With these alterations, deviations in the relation either show up as random events of no importance or are subsumed in the natural growth rate of income. In other words, there can be no trend in the natural rate of unemployment. Such is not the case for the equation as originally written in equation (1), for it would not be possible to distinguish between differences caused by changes in the rate of income growth and by changes in the natural rate of unemployment. Both would appear as changes in the value of the constant. Either type would, of course, be a true structural change in the economy, but they each would have very different meanings.

The natural rate is a reference point for the amount of wage pressure exerted on the economy by a given unemployment rate. If the rate does not change over time, the essential meaning of a given unemployment rate does not change. The potential growth rate for income and the income multiplier are in contrast summary measures of the relations among productivity, labor force growth, and employment. If they do not change, the nature of technological and labor-force growth underlying Okun's Law does not change. All of these measures are subject to some extent to the offsetting forces of substitution, but especially so the natural rate of unemployment. There is good reason to believe that a relative increase in, say, the numbers of some low-skill, high-unemployment group of the labor force would be partly offset by a lowering of that group's wage rate relative to others. There is no similar automatic presumption that an increase in technology would be offset by a decrease in labor force growth, or that it would leave unchanged the potential growth of income.

It is worth noting in this regard that there is no presumption in the present tests as to the

relative importance of labor and other factors in generating inflation. It may be that the source of the stability in the natural rate we will observe is a systematic tightening in the supply of capital or of production inputs to the United States by the rest of the world. Should such be the case, there would be no change in the implications of our analysis for *aggregate* policy aimed jointly at all sectors, but there would be a possibility of devising *specific* policies aimed at the relief of particular bottleneck sectors and thus perhaps at a permanent lowering of the natural rate of unemployment. Thus, the results we obtain should be read entirely as having implications for aggregate policy.

Interpretation of results

We fit the adjusted relation to the unemployment rate for the period 1948.3 through 1974.1—the longest period available with quarterly data for all series—and obtained the following results. Standard errors for the estimated coefficients are shown in parentheses below the equation; income growth is at annual rates.

$$U_t = 5.82 - .092(YA_t - 3.76t) + .856e_{t-1}$$

(.35) (.005) (.21) (.051)

The standard error in fitting this quarterly average unemployment rate is .217 percent, which compares well with the monthly sampling error of .20 percent for the rate published by the Bureau of Labor Statistics.

This relation may be interpreted as follows:

1. If the two-quarter average growth of real income is above a 3.76 percent annual rate, and no temporary factors are at work, the unemployment rate will fall. Below that growth rate, unemployment will rise.
2. If the two-quarter average growth rate is one percent above this critical value and no temporary factors are present, the unemployment rate will decline by .092 percent.
3. If some temporary factor is present in quarter t, then 85.6 percent of the fac-

tor will be present in quarter $(t+1)$.

4. The value of the constant, 5.82 percent, is the sum of the natural rate of employment, defined entirely in terms of productivity and labor force factors,⁴ and the amount of displacement of the unemployment rate from that level in 1948. In calculating the natural rate, we would find that average unemployment in the period of fit was 4.80 percent, and that the average growth rate of real income was 3.77 percent. Because the latter is above the natural growth of income, the natural rate of unemployment must be above the observed average rate. Though the difference in growth rates is small, over the 102 quarters of the sample period, it is not trivial, and the necessary correction comes to .04 percent, making the natural rate of unemployment 4.84 percent.

These results largely validate Okun's results: the 3.8 percent potential growth rate for income and .09 income multiplier are not appreciably different from Okun's 4.0 and .08 figures. It does appear that the natural rate of unemployment is now, and has been for the entire postwar period, far above 4 percent.

We can check on this result by asking whether the underlying relation between income and employment has changed over the years. The answer to this question is a qualified yes: we can be 95 percent certain that the relation has changed, but we cannot be 99 percent certain.⁵ Despite this mild uncertainty, we get large policy implications from the observed changes, because they substantially affect our ability to achieve very low rates of unemployment. This uncertainty does mean that the forecasting error of the relation gets improved by only a very small amount by allowing for a shift. The expected error in our relation is .217 percent in the equation above; after the shift, the expected error drops to .208 percent. Such an improvement in fit would not be worth the added complexity of the relation were it not for its policy implications.

The allowance for shift was made by dividing the period of fit into three equal parts, ending respectively in 1956.4, 1965.2, and 1974.1. The estimated coefficients were set to be constant in the first and last periods, with a smooth transition from the initial to the final values occurring during the second period in order to provide continuous values for all of the estimates throughout the period. The differences which arose were then checked for statistical validity, and only the constant term and the income multiplier proved to have shifted; the multiplier on the time trend did not change. This result is important, for the role of the parameter on the time trend is to determine the relation between the natural rate of growth of income and the natural rate of unemployment: if it does not change, the natural rate of unemployment does not change, not matter what happens to the natural growth of income, because this parameter is the product of the income multiplier and the growth rate of potential income. The same calculation used above yields a natural rate of unemployment of 4.82 percent, essentially the same number obtained before. Thus, the natural rate is now, and has been for the entire postwar period, very close to this number.⁶

However, two important shifts have occurred: an increase in the natural rate of growth of income and a decrease in the multiplier on income. The two equations appear below; the numbers have the same interpretation as before.

1. Fully effective 1948.3-1956.4; declining in importance 1957.1-1965.2.

$$U_t = 6.66 - .099(YA_t - 3.51) + .831e_{t-1}$$

(.45) (.005) (.21) (.055)

2. Increasing in importance 1957.1-1965.2; fully effective 1965.3-1974.1.

$$U_t = 4.03 - .087(YA_t - 4.01t) + .831e_{t-1}$$

(.95) (.005) (.24) (.055)

Thus, achieving a decline in the unemployment rate now requires much higher income growth (4.01 percent against 3.51 percent) than it did earlier, while the response of unemployment to given income growth is lower now than before (.087 against .099). This asymmetric change means that in boom periods, the higher natural rate of income growth and the lower income multiplier both work to keep unemployment from going as low as it would have under the earlier relation, while in recessions the two largely offset each other, with the high natural growth rate still working to keep unemployment up but with the low multiplier now working to keep it down. This point is made in concise form in Chart 3, which contains projections made with two relations for the period from 1970.1 to 1974.1—a period which contains both a recession (from 1970.1 to 1971.1) and a rather long period of very high income growth (from 1971.4 to 1973.2). These projections are made by ignoring the allowance for transitory components (the multiplier on e_{t-1}) and thus track only the basic Okun's Law relation. In this chart, the two relations have almost identical performance in the recession period (the first five quarters), but the relation based on the earlier data begins to deteriorate sharply in the quality of its projection once income growth moves to high levels in 1971.4. The deterioration con-

tinues throughout the high growth period, and only begins to unwind in the most recent three low-growth quarters. The relation in fact projects that the rates reached near the 1973 minimum would be well below the lowest peacetime unemployment rates of the postwar period, reached in the 1955-56 expansion.

The deterioration would not be extremely serious, and there would be no significant differences between the beginning and end of the period, if the deterioration were regarded as arising from a transitory component (Chart 4). But this correction will not work. The two relations once again show almost the same performance during the 1970 recession, with the quality of fit being much better than in Chart 3. After the recession, however, the relation based on the recent period continues to track the actual unemployment rate rather closely, while the relation based on older data steadily under-projects the actual numbers.

Conclusions of study

1. For the postwar period as a whole, the best values for the basic formulation are 3.8 percent for the natural rate of growth of income and .09 for the quarterly multiplier between real income and the unemployment rate. These values agree rather well with the

Chart 3

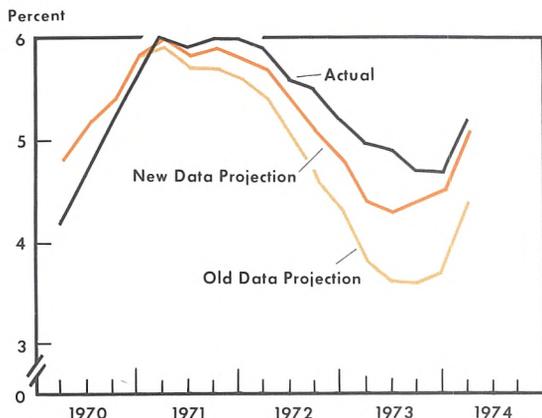
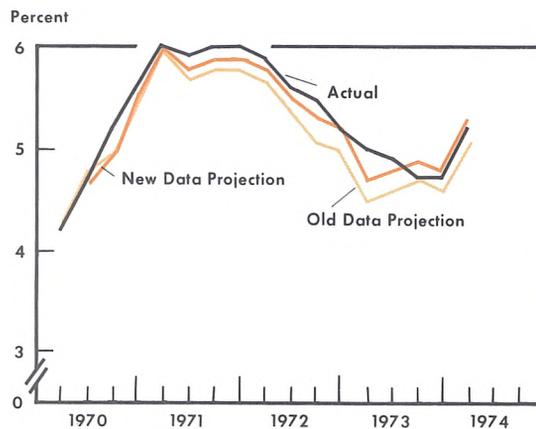


Chart 4



principal Okun results of a 4.0 percent natural growth rate and a .08 income multiplier. Thus the events of the last seven years have not invalidated the main thrust of Okun's Law.

2. The principal applications of the Law—the constructions of potential GNP, the GNP gap, and the full-employment budget—have all been based on a 4.0 percent unemployment rate, and ignore the fact of a 4.8 percent natural rate of unemployment. This natural rate has not changed at all during the postwar period, and thus stands as at least as durable an artifact as Okun's Law itself. It follows that policy based on a 4.0 percent full-employment rate will be an engine of inflation. Policy, both now and in the past, either should have aimed at an unemployment target of 4.8 percent—not 4.0 percent—or it should have built much more comprehensive inflation protection for individuals and businesses into the economy's institutions than it has.

3. Though the added data for the 1970's generally support Okun's number for the postwar period as a whole—with his based on data through the mid-1960's—they also suggest that there has been a change from the relation which held in the 1950's. The shifts involved are modest: the natural growth of real income has increased from 3.5 to 4.0 percent, and the multiplier from income growth to the unemployment rate has declined from .10 to .09, with no change in the 4.8 percent natural rate of unemployment. However, these small shifts have an important policy implication. When income growth is low, the two changes

act to offset each other, and the recession behavior of Okun's Law has thus remained largely unchanged over the years. But when income growth is high, the two shifts reinforce each other and prevent the unemployment rate from going as low as it formerly did. The basic relation projected a minimum unemployment rate of 3.6 percent for the 1971-73 period, while the recent relation projected a minimum of 4.3 percent. It is thus no longer possible to get to 4.0-percent unemployment during even the strongest of peacetime booms.

4. Because the natural rate of unemployment has not changed, it is not possible to describe the shifts which have occurred as being in any meaningful sense "structural." A structurally unemployed person gets that way because he or she possesses a mix of skills which, because of technological factors and the skill mix of the labor force, does not lend itself to finding a job at the going wage. These elements are precisely those which determine the natural rate of unemployment, so that it is hard to conceive of a true structural shift which does not alter that rate. Undoubtedly, there has developed over time a different composition of the labor force and a different mix of available jobs, but the evidence suggests that these changes have been offset precisely by substitution between labor-force categories and by shifts into newly available jobs. This argument does not necessarily mean that there is no problem of structural unemployment: it means instead that the problem has not gotten any worse (or better) over the years.

Footnotes

1. Okun, *The Political Economy of Prosperity* (Washington: Brookings, 1970) p. 102.
2. This statement is a simplification of the subtle Okun approach to the measurement of potential output. After careful analysis, Okun concluded that potential output—adjusted to 4-percent unemployment—grew at an average of 4½ percent in the late 1940's through 1953, at 3½ percent through 1961, and at 4 percent since that time. Our results will largely—though not completely because of different sample periods—validate those numbers. *Ibid.*, ch. 2.
3. This equation is the inverted form of Okun's potential-output equation, written in a way which begs the question of what an appropriate growth rate for output is. The first close analog of this equation appeared in the Council of Economic Advisers' statement to the Joint Economic Committee of March 1961.
4. The Friedman definition takes into account the pattern of individual adjustments to inflation, and thus cannot be used without a formal inflation-generating mechanism. Because the subject here is Okun's Law, we use a narrower definition, without reference to either the prevailing rate of inflation or the pattern of adjustment to that rate. In practice, Friedman's natural rate should be essentially identical with ours. For a formal model of the nominal price apparatus, see Milton Friedman, "A Theoretical Framework for Monetary Analysis," *Journal of Political Economy* (1970), pp. 193-238. To our knowledge, the earliest exposition of the natural-rate concept is in Friedman's "The Role of Monetary Policy," *American Economic Review* (1968), pp. 1-17.
5. The statistical results are in Appendix A.
6. A mathematical treatment of this observation is given in Appendix B.

Technical notes

A. Statistical method. The statistical tests employed above use Scheffe's S-method for the analysis of variance. This method requires that one establish a "pool" of acceptable independent variables for a relation, none of which depends for the desirability of its inclusion in the relation on the presence or absence of any other variable in the relation. The method then operates by casting variable out of the pool: if there are k variables, the method operates by casting out the least important variable, the two jointly least important variables, and so on. The results are normally presented in reverse order of casting out, and thus have the same appearance as a stepwise regression. The difference is that the size of the pool determines the number of lost degrees of freedom, and the method is thus relatively invulnerable to attempts at "data-mining."

The attraction of analysis of variance as an econometric technique has long been obvious, but its use has been severely limited because an appropriate technique for setting up pools for distributed lag models is not at all obvious. A second problem, the stochastic time dependence of most economic time series—which renders invalid the only non-robust aspect of analysis of variance, its assumption of time independence—has been solved by the advent of the Cochrane-Orcutt and Hildreth-Liu serial correlation corrections. The correction used in this paper is Cochrane-Orcutt because it is a true non-linear least-squares technique and thus fits explicitly into the analysis-of-variance framework. The "pool" problem for distributed lags is that we normally have no very clear notion of how long a distributed lag should be, and we often have only the vaguest idea of the proper shape for such a lag: the only more-or-less universal requirement is that the structure be continuous. The standard solution to distributed-lag estimation is the polynomial-

distributed lag, a device which does not lend itself to "pooling" very well: there are 136 different polynomial lags of length between one quarter and sixteen, a "pool" which would more than exhaust the number of postwar quarterly observations on the economy. Our solution to this problem was to select one polynomial of each desired lag length, each set to form a continuous curve through to the maximum lag and have one estimating parameter left over. The simplest such family of curves is the set of parabolas forced to zero at either end of the lag structure. A typical member of the "pool" for variable X_t would be:

$$Z_t = \frac{\left(\sum_{i=0}^k (i+1)(k-i) X_{t-i} \right)}{\left(\sum_{i=0}^k (i+1)(k-i) \right)}$$

The pool variable for the income growth rate YR_t above for $k=2$ is exactly the paper's YA_t variable. Once YA_t entered the relation, no other member of a pool having k go from 1 to 8 had more than the slightest effect on unemployment.

Having checked for lag structure, we then checked for structural change. These tests were separated only because we wanted to use the largest possible sample in the structural change test; with the short structure found, it was necessary to lose only one observation to the distributed lag. The main relevant information from the analysis appears in the table below.

<i>Variables in regression</i>	<i>Sum of squared residuals</i>	$F_1^{*,n-k}$
1. Constant, income, time trend	19.2200	—
2. (1) plus autoregressive correction	4.6983	305.99 ₁
3. (2) plus structural split on income	4.5214	3.83 ₃
4. (3) plus structural split on constant	4.2418	6.40 ₂
5. (4) plus structural split on time trend	4.2275	.33 _x

*F's are placed on line for which the variables included are the maintained hypothesis.

- 1: Significant with at least 99.9-percent confidence.
- 2: Significant with 97.5-percent confidence, but not with 99 percent.
- 3: Significant with 90-percent confidence, but not with 95 percent.
- x: Not significant with 90-percent confidence.

An easy summary device for this analysis is the triangle of F's, which appears below. The $F_{1,n-k}$'s appear on the diagonal.

Test hypothesis	(1)	(2)	(3)	(4)
Maintained hypothesis				
(2) (p correction)	305.99 ₁			
(3) (income split)	159.29 ₁	3.83 ₃		
(4) (constant split)	114.17 ₁	5.22 ₂	6.40 ₃	
(5) (trend split)	85.11 ₁	3.56 ₃	3.38 ₄	.33 _x

1: Significant with at least 99.9 percent confidence.
 2: Significant with 99 percent confidence, but not with 99.9 percent.
 3: Significant with 97.5 percent confidence, but not with 99 percent.
 4: Significant with 95 percent confidence, but not with 97.5 percent.
 5: Significant with 90 percent confidence, but not with 95 percent.
 x: Not significant with 90 percent confidence.

The only variable not worth having in the relation is the structural split on the trend line, which with its very low .33 $F_{1,n-k}$ ratio does not represent a reduction in variance over the relation excluding the variable. We may be 97.5 percent certain that the constant does have a structural split; as a maintained hypothesis, it represents a reduction in variance against all test hypothesis with at least that confidence. We have the same confidence that the structural split on income is significant. Though its $F_{1,n-k}$ as a maintained hypothesis is low (significant only at 90 percent), its $F_{2,n-k}$ with the constant split also included, at a value of 5.22, is significant at 99 percent. We then reduce this confidence so that we have in the constant split because that split is necessary to our confidence in the income shift. And, finally, the Cochrane-Orcutt correction is necessary to the relation to a very high degree of confidence.

B. Computing the natural rate of unemployment. The relations above may be rewritten as errors-in-variables relations with the unemployment role as the sum of the natural rate of unemployment and the implicit displacement of unemployment from this rate at time t :

$$U_t = (U_{xt} + U_n) - a(YA_t - gt)$$

For the natural rate taken as a constant, as may be done by the obvious errors-in-variables interpretation of U_{xt} , we may compute the natural rate for any period for which the sum over the displacements is zero. This sum is zero for the full sample by construction of the results of running least-squares fits of the type presented in this paper. If we take the mean of the above relation, we must have:

$$\bar{U} = U_n - a(\bar{YA} - g\bar{t})$$

We may ignore the moving-average aspect of YA_t because each observed growth rate enters the sum which forms YA_t with unit weight (aside from a minor endpoint problem) and write:

$$\begin{aligned} \bar{YA} &= \frac{1}{n} \left(\sum_{t=1}^n \left(\sum_{i=1}^t (YR_i - g) \right) \right) \\ &= \frac{1}{n} \sum_{t=1}^n (\bar{YR}_t - g)t \end{aligned}$$

An easy and highly accurate approximation to this sum for any long series which contains much movement (as is true of income growth) is to let YR_t equal YR_n , the mean for the full sample. We get:

$$\begin{aligned} \bar{YA} &= \frac{1}{n} \sum_{t=1}^n (\bar{YR}_n - g)t \\ &= \frac{1}{n} \left[YR_n - g \right] \frac{n(n+1)}{2} = \frac{n+1}{2} (\bar{YR}_n - g) \end{aligned}$$

If we apply this formula to the above, we get

$$U_n = \bar{U} + a \frac{n+1}{2} (\bar{YR}_n - g)$$

For the full 1948.3-1974.1 series (103 observations) the relevant calculation is:

$$U_n = 4.80 + .092 \times 52 \times (3.774 - 3.765) = 4.84$$

Note that we must carry one extra digit of accuracy in the income growth rates to perform the calculation to the same accuracy as the other numbers.

The structural split does not complicate the calculation of the natural rate overmuch; it remains true that the sum over the displacements involved is still zero for the full sample, and the natural rate for the full sample comes to 4.82 percent. An indication of how this is derived may be obtained by splitting the relation into two pieces, one relevant to the early set of parameters and one relevant to the late set of parameters. In matrix form, and ignoring the transitory component correction, the relation is:

$$\begin{bmatrix} U_{48.3} \\ \vdots \\ U_{56.4} \\ U_{57.1} \\ \vdots \\ U_{65.2} \\ U_{65.3} \\ \vdots \\ U_{74.1} \end{bmatrix} = \begin{bmatrix} 1 \\ \vdots \\ 1 \\ 33/34 \\ \vdots \\ 1/34 \\ 0 \\ \vdots \\ 0 \end{bmatrix} \begin{bmatrix} YA_{48.3} \\ \vdots \\ YA_{56.4} \\ YA_{57.1} \times 33/34 \\ \vdots \\ YA_{65.2} \times 1/34 \\ 0 \\ \vdots \\ 0 \end{bmatrix} \begin{bmatrix} 1 \\ \vdots \\ 33 \\ 34 \times 33/34 \\ \vdots \\ 67 \times 33/34 \\ 0 \\ \vdots \\ 0 \end{bmatrix} \begin{bmatrix} U_{01} \\ \vdots \\ -a_2 \\ \vdots \\ a_2 g_1 \end{bmatrix} + \begin{bmatrix} 0 \\ \vdots \\ 0 \\ 1/34 \\ \vdots \\ 33/34 \\ 1 \\ \vdots \\ 1 \end{bmatrix} \begin{bmatrix} 0 \\ \vdots \\ 0 \\ YA_{57.1} \times 1/34 \\ \vdots \\ YA_{65.2} \times 33/34 \\ YA_{65.3} \\ YA_{74.1} \end{bmatrix} \begin{bmatrix} 0 \\ \vdots \\ 0 \\ 34 \times 1/34 \\ \vdots \\ 67 \times 33/34 \\ 68 \\ 103 \end{bmatrix} \begin{bmatrix} U_{02} \\ \vdots \\ -a_2 \\ \vdots \\ a_2 g_2 \end{bmatrix}$$

We may now calculate the natural rate for the two pieces of this relation on the assumption that the net displacement of the unemployment rate in each half is zero. This assumption will not quite be true: some covariance will arise in the middle of the period. This covariance should be quite limited, however, because of the declining weights on the early parameters in the middle third and the rising weights on the late parameters. When we perform the calculations, we get:

1. Fully effective 1948.3-1956.4; declining in importance 1957.1-1965.2.

$$U_n = 4.71 + .099 \times 26 \times (3.567 - 3.513) = 4.85$$

2. Increasing in importance 1957.1-1965.2; fully effective 1965.3-1974.1.

$$U_n = 4.89 + .087 \times 25.5 \times (3.972 - 4.013) = 4.80$$

The growth rate for income obtained in the first calculation is above the mean of 3.30 percent obtained by simply splitting the sample in two at 1961.2 because of the effect of high income growth in the boom of 1962-65. The figure in the second calculation gets reduced from the second half mean of 4.18 percent because of the 1957 and 1960 recessions. The figures are evidently quite close together, much closer than the disparity in the mean unemployment rates would suggest.

Summary Description of Information System for Banking Agency Reports

The Federal Reserve System, the Office of the Comptroller of the Currency, and the Federal Deposit Insurance Corporation have long been concerned about the problems and burdens of bank reporting. The three agencies, both separately and jointly, have instituted a variety of programs directed toward these problems. As one part of these programs, the agencies have been engaged for several years in a joint project—the Bank Report Reform Project—to develop and implement a more systematic approach to their procedures for requesting information from banks, for defining what is wanted in the various reports, and for collecting the information. The operating materials and procedures developed in this project have been given the name “Information System for Banking Agency Reports” (ISBAR).

The project was set in motion by an *ad hoc* group of commercial banks—the Steering Committee on Banking Information—and it has progressed in close cooperation with this group. The general approach and main characteristics of the project were developed within this Steering Committee.

The ISBAR procedures are completely voluntary and optional for reporting banks. These procedures will be made available by each of the three agencies for any bank to use if it so wishes. Each bank will decide for itself whether to use the ISBAR procedures or to continue with present procedures. Similarly, the approach does not presuppose or require

any particular design for banks’ internal accounting or recordkeeping systems. Moreover, the system does not add to reporting burdens since it remains within the confines of existing reporting requirements.

A preliminary version of ISBAR has been prepared for banking industry comment. This pamphlet, which is being mailed to all commercial banks, contains a summary of the approach and its major characteristics. A more complete description of all aspects of the system and copies of its operating materials are presented in another set of documents bearing the general title *Information System for Banking Agency Reports*. These documents will be available from the agencies on request in a few weeks.

Members of the banking community and others who are interested are invited to review the approach and its procedures and materials and to communicate general comments or specific suggestions to any of the agencies. Comments received by February 1975 will be taken into account in the preparation of an operational version of the material, which is scheduled for release in the second half of 1975. At that time the three agencies will make the ISBAR procedures operationally available to interested banks.

The summary discussion in this pamphlet focuses on the following questions that reflect the system’s major characteristics:

- (1) What is ISBAR, how will it be used in report

procedures, and what types of banks can use it to advantage?

- (2) What role have commercial banks had in the design and development of the system?
- (3) Will the use of the system be compulsory for banks?
- (4) Does ISBAR involve any changes in the substance of information that banks report?
- (5) Does the use of ISBAR put any particular requirements or restrictions on banks' internal recordkeeping procedures?
- (6) What reports are covered in the system?
- (7) How will future changes in reporting requirements be handled in the system?
- (8) Will the ISBAR approach be extended to other types of reports?
- (9) How does ISBAR fit into the general efforts of the banking agencies to deal with problems of reporting burden?
- (10) What additional materials on the system are available and how can they be obtained?

(1) What is ISBAR, how will it be used in report procedures, and what types of banks can use it to advantage?

ISBAR consists of a set of materials and procedures that provide, as an alternative to present procedures, a systematic basis for: (a) banking agency requests for information from commercial banks; (b) the definition of the information requested; (c) bank generation of this information; and (d) bank reporting of the information to the agencies.

In the ISBAR approach, each line of information requested in agency reports that deal with balance sheet and related items is completely defined in terms of an appropriate combination of the elements of a standard classification structure. This single, comprehensive structure embraces the definitional needs of all the reports covered in the system. The system's main operating documents are the classification structure, a Dictionary defining each element of that structure, and a set of report Instructions that specify the information requested in the reports in terms of the elements of the classification structure.

For banks, ISBAR will have four separate

uses: (a) in their determination of the definition of agency information requests; (b) in connection with their generation of information for agency reports on a coded or automated basis; (c) as an input to their design of record-keeping and information systems; and (d) in connection with the physical form of reporting to the agencies.

(a) The fundamental use of the system by banks will be definitional. The operating documents provide each bank with the basis for systematically determining the complete specification of all agency requests for information that are covered by the ISBAR structure. Similarly, a basis is provided for a systematic comparison of what is wanted on different reports requesting somewhat similar information.

For such definitional purposes any bank—regardless of size, accounting procedures, or extent of automation or coding of accounts—may find that it can use the system to advantage. This definitional use is independent of the bank's accounting methods or internal procedures. There is no requirement, or even presumption, that a bank has coded its accounts or automated any of its procedures, nor is there any implication that it ever intends to do so. While the Instructions for each report line are stated in terms of code numbers, these codes—insofar as definitional use is concerned—are internal to the ISBAR documents. They serve simply to guide the user from the coded Instructions for the line to the elements of the classification structure and to the Dictionary defining these elements. Once the definition of a line is determined in this way, the ISBAR codes have no further significance for a bank using the system for definitional purposes only.

(b) While the ISBAR operating documents may be used solely for definitional purposes, they may also be used in connection with bank generation of agency reports on a coded or automated basis. The ISBAR classification structure provides the substantive basis of bank coding of accounts that would be appropriate for the agency reports. The ISBAR coded report Instructions state agency requests for information in terms of the elements of the classification structure. With appropriate identification and adaptation of its own classifica-

tion system to the ISBAR structure, a bank could—if it so chose—use the ISBAR coded Instructions as the basis for compiling some or all of the data needed for agency reports by retrieval procedures that would be stated in terms of the classifications used in its own records.

A bank that has already coded or automated some of its accounts or files for internal purposes may, therefore, have some interest in examining the details of the ISBAR materials to determine the feasibility of using ISBAR to facilitate the coded or automated generation of some of the information needed for agency reports. Such an examination would be a necessary part of the bank's determination of the reports for which it might be worthwhile to link, and adapt as appropriate, its present procedures to the ISBAR materials.

(c) Another potential use of the ISBAR materials is as an input to systems planning for banks that are designing new or revised information systems or automated recordkeeping systems. Such a bank may be interested in a detailed examination of the ISBAR materials if it has any thought of incorporating agency-report-generation features into its new systems or if it has any concern about the relationship between reporting requirements and its systems design.

(d) ISBAR also provides banks with alternative procedures with respect to the physical form of reporting information to the three banking agencies. Banks are given two types of options in this regard. In the first, the data being reported may be identified either by ISBAR codes or by existing procedures. In the second, each bank will have the choice of transmitting the data either by use of the present report forms or by means of computer printouts or punched cards in standard formats to be set by the agencies. Any bank that can put its report returns on computer file may find it convenient to transmit reports by the new alternative methods—even if it does not use other ISBAR procedures and materials.

Eventually, consideration may be given to extending the options in this area to include transmission of the data by magnetic tape or terminals. A few Federal Reserve Banks may

be interested in pursuing such transmission methods on an experimental basis with a limited number of banks.

(2) What role have commercial banks had in the design and development of the system?

Commercial banks have played a major role in the design and development of ISBAR. The project originated when the group of banks making up the *ad hoc* Steering Committee on Banking Information suggested to the banking agencies that the banks and the agencies work together to develop an approach to reporting that would permit banks to deal with reporting requirements in a more effective manner. Under the chairmanship of M. H. Schwartz, then a vice president of the First National City Bank of New York and now Director of the Division of Management Information and Telecommunications Systems of the Atomic Energy Commission, and later Robert K. Wilmouth, Executive Vice President of the First National Bank of Chicago, the Steering Committee set the general direction of the project and established the major scope and characteristics of the approach. The members of the Steering Committee stressed to the agencies that banks had a pressing need in the area of reporting and that the project was directed toward that need. The Committee persuaded the agencies to establish the project and to implement the resulting system as an operating alternative for banks.

Throughout the project, the Steering Committee continued to give general guidance to the project staff. In addition, consultations with operating personnel at each of the Steering Committee banks during various stages in the work contributed to significant improvements in the project results.

Commercial bank participation will continue during the present review period. Comments by individual banks on this preliminary version will be taken into account in preparing the operational version to be issued in 1975.

As a supplement to the reviews by individual banks, The American Bankers Association (ABA) and the Bank Administration Institute (BAI) have established a joint steering com-

mittee to provide a focal point for industry reaction to the ISBAR approach. The members of the committee are Virgil Dissmeyer, Senior Vice President and Cashier of the Northwestern National Bank of Minneapolis; Graham P. Dozier, III, Comptroller of Wachovia Bank and Trust Company, N.A., of Winston-Salem; Gail M. Melick, Executive Vice President of Continental Illinois National Bank and Trust Company of Chicago; Paul Laskoski, Senior Vice President (Finance) of The First Pennsylvania Banking and Trust Company of Philadelphia; James E. Lodge, Director of the Operations and Automation Division of The American Bankers Association; and Thom McCord, Principal Bank Counselor of the Bank Administration Institute.

The committee is recruiting a group of banks to experiment with procedures for linking ISBAR into their own accounting and information systems. Any bank interested in obtaining more information about the experiment should contact the ABA or BAI staff representative on the committee.

In addition, the ABA and BAI are prepared to organize appropriate forms of educational sessions on ISBAR if a need becomes evident.

(3) Will the use of the system be compulsory for banks?

Nothing in the ISBAR approach is compulsory for any bank. Use of the system is completely at the option of each commercial bank. A major purpose of the approach is to provide the flexibility of alternative procedures to those banks that can use such procedures to advantage, while also allowing each bank the option of continuing under existing procedures.

Each reporting bank has the option to use the system or not. If a bank does choose to use the system, other options arise on how and to what extent. Thus, a bank may use the ISBAR materials for any one, or any combination, of the uses discussed under Question (1). It may use them for all of the reports covered by the system that are applicable to it or for any subset of reports or even for parts of reports. It may use the approach in connection with some of its files or some of its

departments and not others. The bank may adopt the procedures as soon as ISBAR becomes operational or at any time thereafter.

(4) Does ISBAR involve any changes in the substance of information that banks report?

ISBAR does not add to, or otherwise change, the substance of reporting requirements. The system focuses on procedural and format matters and on improvement, codification, and systematization of definitions within the context of the existing substance of reports. Whether a bank uses ISBAR or the current procedures, it will report the same items of information at the same levels of detail for the same reports. Any future changes that occur in reporting requirements as a result of changes in banking agency information needs will be reflected in the ISBAR operating materials—just as they will be in the current reporting forms—but the ISBAR procedures do not in themselves initiate such changes.

(5) Does the use of ISBAR put any particular requirements or restrictions on banks' internal recordkeeping procedures?

ISBAR does not impose, or presuppose, any particular design for banks' accounting, record-keeping, or information systems. Each bank that uses the ISBAR materials will continue to determine its own procedures in accordance with its individual needs.

This is true in particular for the classification and coding systems used by a bank to identify and differentiate its accounts. ISBAR does provide the substantive basis for the classification structure that is needed for such identification of accounts as is relevant to reporting requirements. But the particular format, organization, and level of detail of the ISBAR classification structure does not constitute a recommended standard system of classification for bank use. For its own purposes, each bank may have need for additional classification detail and for a different organization of its classification system. Similarly with respect to the code num-

bers that represent the classification structure, ISBAR does not require or provide a particular coding system for use by banks in the coding of their accounts. The code numbering used in the ISBAR documents is for identification and reference within the ISBAR materials and for coded communication of information requests. These ISBAR codes are not intended or designed for bank use in coding accounts. A bank that makes any use of the ISBAR materials would use a code numbering system in the classification of its accounts that is appropriate for its own needs.

However, because ISBAR does not put any particular requirements on banks' recordkeeping procedures, each bank using the ISBAR materials in connection with coded or automated generation of agency reports will have to prepare and maintain a conversion table linking the ISBAR classifications, codes, and procedures to its own records, classifications, codes, and procedures. This conversion table would be the operating link between the ISBAR report Instructions, which are stated in terms of the ISBAR codes, and the information as it is organized and identified in a bank's records. As mentioned in connection with Question 2, some experimental exercises in performing the kind of substantive identification necessary to prepare such conversion tables will be organized by the joint ABA-BAI steering committee.

The absence of any requirements on banks' internal procedures, other than for a conversion table, does not mean that a bank's decision to use the ISBAR materials may not have some effect on its recordkeeping procedures. It is unlikely that there will be any significant impact in those cases where the bank is using the ISBAR materials solely for definitional purposes, although even here clarification of reporting requirements may result in some change in internal records. But there may be a significant impact in those instances where a bank is using the ISBAR materials as an input to its systems design activities or where a bank is trying to adapt its existing procedures to take advantage of the ISBAR approach. However, even where use of the ISBAR materials strongly influences the direction that a bank takes in designing or

adapting its procedures, each bank will still be free to design its systems to meet its own needs.

(6) What reports are covered in the system?

When ISBAR becomes operational in 1975, it will cover the definitional requirements of reports that meet all of the following conditions: (a) The reports are issued by one or more of the three Federal banking supervisory agencies (including the Treasury's Foreign Exchange Reports collected through the Federal Reserve Banks); (b) they are submitted by commercial banks; and (c) they request information on balance sheet and related items. Certain reports meeting these criteria are excluded as unsuited for the ISBAR approach—for example, reports that request judgmental or qualitative information and some one-time or infrequently collected reports that ask for highly detailed, specialized information. Within the indicated scope, the system covers all reports—whether regulatory, supervisory, or statistical; whether mandatory or voluntary; whether completed by all banks or by a sample of banks.

Reports that will not be explicitly covered in the 1975 version of the system include: (a) banking agency reports that do not deal with balance sheet and related items, such as the Report of Income; (b) reports collected from bank trust departments, Edge Act subsidiaries, and bank holding companies and other nonbank affiliates; (c) reports of other Federal agencies, such as the Securities and Exchange Commission and the Internal Revenue Service; and (d) reports of State banking supervisory agencies.

Similarly, information needs of commercial banks for purposes other than compiling the covered reports are not explicitly incorporated in the structure. While there is a considerable overlap between the information that banks need for reporting and what they need for their own purposes, banks presumably require classification detail for internal purposes that is not provided in the ISBAR structure. Because the additional details needed vary from bank to bank, the commercial bank Steering Committee on Banking Information recommended that the

project not attempt to develop a comprehensive classification structure covering all of the information needs of commercial banks.

The preliminary version of the operating materials has not yet incorporated some of the reports that will be covered in the 1975 operational version. The incorporation of the remaining reports to be covered will undoubtedly result in some changes in the ISBAR classification structure and other materials. These changes will be in addition to those resulting from industry and agency review of the preliminary version. The specific reports covered in this preliminary version and those to be included in the 1975 version of ISBAR are listed in the additional descriptive material that is available on request.

(7) How will future changes in reporting requirements be handled in the system?

When ISBAR becomes operational in 1975, the classification structure will reflect the definitional requirements of those reports coming within the scope of the system that are being collected at that time. Not all future requests by banking agencies for new or revised information will come within the scope of ISBAR, but those that do will require prompt preparation and distribution of additional ISBAR materials. If such requests for information can be completely defined in terms of the classification structure as it stands, the main changes required in the material will be the preparation of coded Instructions for the new requests.

However, there can be no guarantee, or presumption, that future information needs of the agencies—even if within the general scope of the system—will be limited to those that can be defined in terms of the ISBAR classification structure as it stands at any time. When agencies do request such new information that is not so definable, appropriate changes will have to be made in the ISBAR classification structure as well as in the Instructions. However, agency procedures will be established in order to prevent unnecessary changes in the structure and to keep to a minimum those changes that are required.

Once the system is operational, all ISBAR documents will be maintained and updated as needed. Whenever a change in reporting requirements entails a change of any kind in the structure, notice to this effect, along with the necessary revisions and additions to all relevant ISBAR documents, will be sent immediately to all banks that have the ISBAR materials. In the 1975 version, these documents will be issued in a looseleaf form so that new and revised pages may be incorporated readily.

(8) Will the ISBAR approach be extended to other types of reports?

An extension of ISBAR to the balance sheet reports requested by other agencies—for example, the Internal Revenue Service, the Securities and Exchange Commission, the Department of Commerce, and the State bank supervisors—would probably require the addition of considerable detail, but not necessarily a drastic redesign of the structure. From the beginning of the project, the intention has been to cover these reports eventually, but the administrative problems involved in doing so have not yet been faced. A feasibility study will undoubtedly be conducted after the system has been satisfactorily implemented in its present scope and is working smoothly.

Extension of the approach to the Report of Income or to reports submitted by bank holding companies would raise difficult problems of substance. These reports might require quite different parallel structures rather than incorporation into the present structure. It is unlikely that the project will be able to turn to those areas until there has been considerable operating experience with the present coverage of reports.

(9) How does ISBAR fit into the general efforts of the banking agencies to deal with problems of reporting burden?

The burden of banking agency reports on banks arises both from the substance of the information to be reported and from the procedures used in requesting, defining, and transmitting the information. ISBAR as such deals

only with matters of reporting procedure; it takes the substance of reports as given. However, ISBAR was also intended and designed to be used as a comprehensive framework for approaching problems of substance and to give technical support for those agency programs dealing with such problems. The ISBAR materials provide an effective mechanism for the kind of detailed and comprehensive comparison of the contents of existing reports that would be needed in any program of evaluation and restructuring of the substance of reports. Moreover, the system will provide an efficient mechanism for communicating to reporting banks the results of revisions of individual reports or restructuring of groups of related reports. Also, because it provides a sharp and immediate focus on definitional questions, the system—once it is operational—will have a significant role to play in the design and introduction of new requests for information.

(10) What additional materials on the system are available and how can they be obtained?

The full presentation of ISBAR is contained in a set of documents that provides both a more complete description of the system and copies of the operating materials. The presentation bears the general title *Information System for Banking Agency Reports* and is divided into four major parts:

PART 1 is a general description of the system—its origins, purposes, scope, characteristics, uses, and operating materials and procedures. It also discusses the relationship of the system materials and procedures to banks' own recordkeeping and information systems.

PART 2 consists of the various operating documents required to implement the procedures of the system. These include the classification structure needed to specify the lines of the covered reports, a Dictionary defining each element of the structure, and a set of coded report Instructions that specify the Report of Condition and its schedules in terms of the elements of the classification

structure. Part 2 also includes a technical *Guide to Operating Documents* that describes in detail the formats, contents, and use of these documents.

PART 3 contains the coded report Instructions for all covered reports except the Report of Condition, which is in Part 2. Because all banks do not prepare the same reports, a bank requesting Part 3 will receive only those coded report Instructions that are relevant to it.

PART 4 comprises supplementary documents that are not needed for the definitional use of the system but that may be of interest for design and evaluation purposes to those banks that desire to use the system in connection with coded or automated retrieval of information for agency reports. A description of these supplementary documents is contained in the *Guide to Operating Documents* of Part 2.

Each part of the ISBAR presentation is available separately upon request. Banks may request as much of the material as they wish; but because the entire presentation is of considerable size, banks with no previous exposure to the system may find it helpful to examine the descriptive Part 1 before deciding to request the operating documents of Parts 2 and 3 or the supplementary documents of Part 4.

The documents making up the presentation may be obtained by writing to the Board of Governors of the Federal Reserve System, the Office of the Comptroller of the Currency, the Federal Deposit Insurance Corporation, or any Federal Reserve Bank. The specific addresses to which requests should be sent are listed on the inside of the back cover of this pamphlet. Requests should specify which parts of the presentation are wanted.

In addition to providing the documents, the agencies will endeavor, within the limits of the availability of knowledgeable personnel, to discuss the use of the ISBAR materials with interested banks. Banks or groups of banks that are interested in arranging discussions between their staffs and the project staff should address inquiries concerning the possibility of such discussions to any of the agency offices listed on the inside of the back cover.

AVAILABILITY OF ISBAR DOCUMENTS

The various parts of the ISBAR presentation and additional copies of this pamphlet may be obtained by writing to any of the offices listed below. (Comments on the approach may also be sent to the same addresses.)

Bank Report Reform Project
Board of Governors of the Federal Reserve System
Washington, D.C. 20551

Department of Banking and Economic Research
Office of the Comptroller of the Currency
Washington, D.C. 20219

Division of Research
Federal Deposit Insurance Corporation
Washington, D.C. 20429

Bank Report Reform Liaison Officer
Federal Reserve Bank of Boston
Boston, Massachusetts 02106

Bank Report Reform Liaison Officer
Federal Reserve Bank of New York
New York, New York 10045

Bank Report Reform Liaison Officer
Federal Reserve Bank of Philadelphia
Philadelphia, Pennsylvania 19101

Bank Report Reform Liaison Officer
Federal Reserve Bank of Cleveland
Cleveland, Ohio 44101

Bank Report Reform Liaison Officer
Federal Reserve Bank of Richmond
Richmond, Virginia 23261

Bank Report Reform Liaison Officer
Federal Reserve Bank of Atlanta
Atlanta, Georgia 30303

Bank Report Reform Liaison Officer
Federal Reserve Bank of Chicago
Chicago, Illinois 60690

Bank Report Reform Liaison Officer
Federal Reserve Bank of St. Louis
St. Louis, Missouri 63166

Bank Report Reform Liaison Officer
Federal Reserve Bank of Minneapolis
Minneapolis, Minnesota 55480

Bank Report Reform Liaison Officer
Federal Reserve Bank of Kansas City
Kansas City, Missouri 64198

Bank Report Reform Liaison Officer
Federal Reserve Bank of Dallas
Dallas, Texas 75222

Bank Report Reform Liaison Officer
Federal Reserve Bank of San Francisco
San Francisco, California 94120