APPENDIX

ELIMINATING INFLATION BY 1995

Special Presentation to the FOMC

December 18, 1989

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Our presentation this afternoon will focus on identifying the probable macroeconomic consequences of an effort to stabilize the price level by 1995 through the application of monetary policy. We shall examine a set of alternative characterizations of the effects of central bank credibility on inflation and output, and we'll attempt to identify those lessons from our analysis that have the most direct bearing on your decisions.

Introduction

Your first exhibit provides a brief outline of our presentation. We'll begin with a discussion of the long-run relationship between money and prices, using the P-star model to illustrate a money path that is consistent with reaching price stability by 1995. From there, we will discuss the key features of the economy influencing the costs of disinflation, focusing on the difficulties of reducing inflation expectations and the related issue of establishing and maintaining the credibility of the central bank. We consider these issues with the aid of two econometric models that differ in the degree to which monetary policy announcements are viewed as credible by workers and firms. In addition to inflation expectations, many other elements of the economic environment might work for or against achieving price stability in the first half of the 1990s. We outline the consequences

for the economy of seeking zero inflation in the face of persistent downward pressure on the foreign exchange value of the dollar, a jump in world oil prices, and a looser-than-expected fiscal policy. Finally, we discuss some strategic issues surrounding the achievement of price stability by 1995. In particular, we compare a policy that slows the economy sharply in the near term and then produces a gradual lowering of the unemployment rate, with an alternative policy that leads to a smaller increase in the unemployment rate but one that is more persistent.

Your second exhibit places the notion of price stability in some historical perspective. The upper panel plots the level of the consumer price index since 1913, the year the Federal Reserve System was founded. The lower panel plots the corresponding inflation rate. The historical record suggests that even rough approximations to price stability have not occurred with great frequency. In the past 75 years, there have been three periods of approximate sustained price stability--shown by the shaded areas. The first two episodes occurred between the world wars. Over the period from 1922 to 1929, there was virtually no net change in the price level, and from 1934 to 1940 the average increase in the price level was less than one percent per year. However, as seen in the lower panel, there was considerable variation in annual inflation rates, which fluctuated between positive 5 percent and negative 4 percent during these intervals. In the post-World War II period, inflation was fairly low and relatively stable between 1951 and 1965--averaging just 1-1/2 percent annually and varying between minus

3/4 percent and plus 4 percent. Of course, even the low rates of inflation during the 1951 to 1965 interval led to a substantial cumulative rise in the price level of more than 20 percent.

Money and Prices: The P-Star Model

Although the year-to-year fluctuations evident in inflation can be caused by a variety of supply and demand disturbances, over the longer haul, a persistent rise in the price level is a phenomenon that cannot occur without at least the acquiescence of the monetary authority. Monetary theory maintains that, while money growth may cause short-run movements in real output, in the long run, money only affects the price level--with fundamental real forces, such as population growth and productive efficiency governing the expansion of real output. The P-star model, outlined in the upper panel of exhibit 3, embodies this theory and provides a convenient framework for summarizing the observed dynamics of the relationship of money and prices. P-star--shown in equation 1--is defined as the equilibrium price level associated with a given stock of M2. It is calculated under the assumption that M2 velocity is at its long-run average and that output is at its potential level, measured by the level of real GNP associated with the natural rate of unemployment.

Equation 2 of the P-star model tells us how the system will adjust if disturbed from long-run equilibrium. The model suggests that when P-star is above the actual price level, there is a tendency for inflation to increase as the price level moves toward its equilibrium. This correlation can be seen in the bottom two panels. The shaded areas

highlight periods when P-star was above P and inflation generally was rising. In the unshaded intervals, P-star was below P and, for the most part, inflation was easing, with the period from 1979 to 1985 the most notable episode of disinflation. At present, the price level is close to its estimated equilibrium, and the model is not pointing to any significant change in inflation.

In exhibit 4, we use the P-star model to solve for a path of M2 growth that yields an inflation rate close to zero in 1995. Starting in the upper panel, we used the staff projection for the growth of M2 during 1990 and 1991 and then trimmed money growth a bit further over the remainder of the projection horizon. As seen in the middle panel, the slowing growth of money creates a widening gap between P and P-star. According to the model, that price gap places gradual downward pressure on the inflation rate--shown in the lower panel.

One of the principal messages of this model is that, given the long lags between money growth and inflation, a five-year horizon is short, if the goal is a gradual elimination of inflation from current levels. Given the inertia in inflation that is implied by the estimated coefficients of this model, any significant delay in the slowing of M2 growth from that shown in this simulation would have required a much sharper tightening of policy later to reach price stability by 1995.

The primary shortcoming of the P-star model for the purposes of today's discussion is that it provides no insight into the consequences of monetary policy beyond its probable effect on inflation, with the

most notable unobserved consequence being the output loss that might be associated with eliminating inflation. The model doesn't imply the absence of such costs, it simply lacks the ancillary structure to describe them.

Expectations and the Costs of Disinflation

The upper panel of exhibit 5 lays out a few factors influencing the costs of disinflation. In general, output losses arise when the wage- and price-setting behavior of workers and firms is not fully consistent with the current actions and announced intentions of the monetary authority. Rigidities in prices and wages that can prevent instantaneous adjustment to changes in monetary policy may take many forms. One is legal contracts, such as collective bargaining agreements or supply arrangements. Another is the costs associated with changing prices, which may be as obvious as the expense of printing new catalogs, menus or price lists. Finally, there are decision lags, which reflect the time required to set new prices in response to changes in the economic environment.

But perhaps a more pervasive question is how rapidly and through what channels do inflation expectations adjust to changes in monetary policy. Even absent the rigidities noted above, wages and prices will exhibit a good deal of inertia if past patterns of price movements are expected to persist. A reduction in the growth of money that is not accompanied by a proportionate reduction in inflation expectations is likely to have negative effects on output.

Some gauge of the current degree of tension between people's expectations of future inflation and the goal of price stability is provided by available survey data. In the middle panel, we have plotted the results of the Hoey survey for both ten-year-ahead inflation expectations--the short dashes--and one-year-ahead inflation expectations--the long dashes, as well as actual consumer price inflation--the solid line. For most of this decade, long-term inflation expectations have exceeded short-term expectations and actual inflation, suggesting that respondents anticipated a rise in inflation over the longer run. In that regard, an encouraging feature of recent survey results has been the further gradual drop in long-term inflation expectations since 1987, a period in which actual and expected short-term inflation edged up. This drop has brought long-term expectations down to roughly the current rate of inflation, perhaps pointing to confidence among market participants that the FOMC will act to prevent any significant acceleration of inflation.

By the same token, the survey evidence also suggests that those individuals polled do not expect the FOMC gradually to eliminate inflation. Inflation over the next ten years still is expected to average about 4-1/4 percent annually, with little difference anticipated between the first and second five-year periods.

Given the considerable gap between current expectations and the goal of price stability, a key question becomes one of how these inflation expectations can be reduced. We can't provide a definitive answer to this question. Instead, we shall present several hypotheses

about how expectations are formed, examine their implications, and gauge their likelihood by looking at relevant historical evidence.

With the Federal Reserve playing a crucial role in the longer-term behavior of the price level, the lower panel suggests three possible interactions between the policy of the FOMC and the formation of inflation expectations. One hypothesis might be that FOMC announcements have complete credibility with all wage and price setters, so that inflation expectations promptly fall into line with announced FOMC intentions both for the present and for the future. Another hypothesis might be that people observe and respond to the actions of the FOMC, but are unwilling to alter their current behavior on the basis of announcements of future policy plans. A third hypothesis might be that people reduce their inflation expectations only when they see actual progress toward lower inflation. These alternatives span a fairly broad spectrum of possibilities, but do not capture all of the subtleties that likely are associated with how workers and firms anticipate, learn of, and respond to changes in policy. In particular, the degree of central bank credibility could change over time, as individuals learn whether the FOMC follows through on its announcements.

Forward-Looking Model

To explore the implications of some of these hypotheses, we have employed an experimental model with forward-looking expectations developed in the Division of International Finance. This model--outlined in your next exhibit--incorporates so-called "rational expectations"; that is, it assumes individuals are forward looking and

understand the structure of the economy well enough to anticipate correctly the consequences of monetary policy for inflation and output. Another important underlying assumption of the model is that staggered wage and price contracts create rigidities that prevent an immediate adjustment of prices to unexpected changes in monetary policy.

We use the model to examine two cases that differ in the degree of central bank credibility. In one case, labeled "strong credibility," we have assumed that, during the first two years of a deceleration of money, people expect the FOMC to permanently hold money growth at the lower rates of increase that are actually observed, but do not act on the FOMC's announcement of future reductions in money growth. However, after witnessing two years of monetary deceleration in line with previous FOMC announcements, people come to believe that the FOMC will carry out the plans it has announced for future years and, therefore, are willing to alter wage and price setting today on the basis of announced future changes in monetary policy. In essence, the FOMC, by acting on its announcements in the first two years, is assumed to earn full credibility for its subsequent longer-range policy announcements. In the second case, labeled "weak credibility," it is assumed that people believe that the FOMC will hold to current money growth rates in the future, but are not willing to alter current behavior on the basis of announced future policies. In this case, credibility must be earned year by year through demonstrated policy action.

In order to perform these simulations, as well as others that we undertake in our presentation, we have made a number of additional

assumptions about other key variables. First, we have assumed that, in the absence of any significant change in real interest rates from current levels, the foreign exchange value of the dollar in real terms would remain constant. Second, we have held the real price of oil at its current level over the projection interval. And finally, we have assumed that the full-employment budget deficit is reduced from over $160 billion now to near zero by 1996.

Your next chart displays the effects on inflation, output, and unemployment of alternative assumptions concerning central bank credibility. In both cases, we assume that the FOMC announces in advance its intention to slow money growth to rates consistent with attaining price stability by 1995. Under strong credibility, shown as the long dashes in the panels, inflation falls rapidly--hitting about 2-3/4 percent in 1991 and close to zero by 1992. Growth in real GNP slips a bit below potential in 1990 and 1991, but moves a bit above potential, thereafter. The unemployment rate peaks at nearly 6 percent in 1991 and drops back to an assumed "natural rate" of 5-1/2 percent by 1994. All told, there are small losses in output in the interval during which the FOMC is establishing its credibility and virtually no losses beyond that period.

In the case of weak credibility--shown by the short dashes--inflation slows more gradually over the projection interval. In this case, because wage and price setters are unwilling to alter their current behavior before seeing the actual implementation of monetary policy, the continued reductions in money growth are not anticipated and

acted on in advance. The consequence is that growth in real GNP is weaker and the unemployment rate higher than in the case of strong credibility. In this simulation, growth in output remains a bit below potential throughout the period, and the unemployment rate drifts up to near 6-1/4 percent by 1995.

The potent effects of inflation expectations and the degree of credibility of the monetary authority in this model rest on a number of strong assumptions about economic behavior. Larry Slifman now will present some simulation results using the Board's large-scale econometric models, which contain a different hypothesis about expectations and credibility.

Zero Inflation Base Case

Your next exhibit, titled "zero inflation base case," shows the results of a simulation derived by combining the results of two large-scale econometric models used by the Board's staff--the MPS quarterly econometric model of the U.S. and the multicountry model. For convenience, however, I shall refer to this combination as the Board model. Both the Board model and the forward-looking model that Dave just discussed have a similar structure, except that in the Board model individuals do not change their expectations about inflation until they see a change in the actual inflation rate. Consequently, in the Board model credibility plays no direct role, as monetary policy influences expectations only by affecting actual inflation.

Comparing the upper and lower panels on the left, you can see that in this simulation, a steady slowing of inflation can be achieved

without a recession. We will use this simulation as the base case for examining alternative scenarios later in our presentation. Looking now at the results of this simulation more closely, the steady slowing of inflation is achieved by raising the unemployment rate over the next two years to about the 7 percent neighborhood, and maintaining labor market slack close to that level through 1995. Accompanying this unemployment path would be a slowing of real GNP growth to an average of a little under 1 percent annually during the next two years or so, followed by a pickup to the neighborhood of potential GNP growth through the mid-1990s.

Achieving such a path for real GNP would require a slowdown in the growth of M2 during the early 1990s. Consistent with the monetary restraint on aggregate demand over the next few years, some increase in real interest rates would be likely. Later in the period, monetary restraint would have to be eased in order to prevent further increases in unemployment, and real interest rates would decline. I should note that the entire path of real rates shown in the exhibit is held down somewhat--reflecting our assumption of a shrinking budget deficit. Peter Hooper will have more to say on the role of fiscal policy in a few minutes.

The critical point to draw from this simulation and the simulations based on the forward-looking model is the link between the costs of eliminating inflation and the speed with which inflation expectations change: the more people tend to adjust their inflation expectations before prices actually change--that is, the more policy is

believed in advance of results and expectations are forward looking--the lower will be the costs of disinflation.

Sacrifice Ratios

At this point, a natural question to ask is "which of these model simulations is more realistic?" One approach to answering this question is to compare the sacrifice ratios implied by the models with historical ratios. This is shown in exhibit 9. The sacrifice ratio is arrived at by dividing the amount of disinflation during a particular time period--measured in percentage points--into the cost of that disinflation--measured as the cumulative difference over the period between the actual unemployment rate and the natural rate of unemployment. Thus, it is a measure of the amount of excess unemployment over a year's time associated with each one percentage point decline in the inflation rate. The larger the sacrifice ratio, the greater the cost for each percentage point of disinflation. For example, assuming that the natural rate of unemployment during the next five years will be roughly 5-1/2 percent, the strong credibility simulation presented by Dave suggests that reducing inflation by nearly 4 percentage points will cost seven-tenths of a percentage point in terms of excess unemployment, for a sacrifice ratio of 0.2, while the weak credibility simulation has a sacrifice ratio of 0.6. In contrast, the sacrifice ratio implied by the Board model simulation--2.2--is several times larger.

Lines 4 to 7 of the table show sacrifice ratios in the United States calculated for the four periods of disinflation since the end of

the Korean war. During three of the periods, the sacrifice ratio was about 2 or more. The exception was the 1970 to 1972 period, when the costs were contained (if only temporarily) by the imposition of wage and price controls in August 1971. Finally, for purposes of comparison, lines 8 to 12 show sacrifice ratios for five other industrialized countries; despite the wide variety of institutional arrangements and of purported degrees of policy credibility in these countries, the ratios generally tell a story about the historical costs of disinflation similar to that for the United States.

Thus, the historical experience suggests that apart from incomes policies or other controls, which have their own problems, the use of macroeconomic policies to reduce inflation does involve costs, and those costs are of an order of magnitude consistent with the simulation results from models in which inflation expectations do not adjust in advance of actual inflation. It seems quite possible that over time an announced disinflation policy that had established some successes might begin to have a perceptible effect on expectations, and sacrifice ratios might be less than those observed in the past. Nonetheless, the Board model comports well with the historical evidence on sacrifice ratios and would seem to be a useful starting point for measuring the costs of disinflation.

Realism of the Models

Of course, other questions remain about the realism of our econometric simulations. In particular, as noted on the top panel of your next exhibit, many analysts have suggested that such phenomena as

increased global competition, heightened efficiency and cost consciousness on the part of business, and the diminished strength of labor unions may have fundamentally changed the way wages and prices are determined in the United States. Thus, it might be argued that an econometric model estimated using historical data would not adequately predict future price developments, and that the sacrifice ratio in the 1990s could be lower than in the past.

The lower panel addresses this issue in a simple way, although in other work the Board's staff has performed a more rigorous analysis with the same basic results. The exhibit shows actual inflation--the solid line--and a forecast generated by a version of the price and wage sector of the Board model estimated using data only through 1979; so that what we are showing is an out-of-sample forecast. If there had been a fundamental change in the wage and price determination process during the 1980s that was not captured by the model, then we would expect to see large, persistent errors in the out-of-sample forecasts. As you can see, however, the model has tracked actual inflation reasonably well during the past decade. To be sure, there have been some large errors--notably in 1984--but they have dissipated within a couple of years, and the model has been right on track recently. This suggests that any effects of structural changes in labor and product markets already are captured in the model by their effects on unemployment, productivity, and inflation expectations.

Another issue related to the realism of the model simulations is the question of financial strains and financial fragility. For

example, Chairman Greenspan in his appearance before Representative Neal's subcommittee said that efforts to eliminate inflation could produce a "major financial crunch" unless they are accompanied by a significant reduction in the federal deficit. Frankly, apart from providing us with a rough and uncertain guide to the likely path of interest rates, our models are not equipped to shed much light on this issue. Clearly, a combination of higher real rates and weaker economic growth is not a hospitable environment for highly leveraged firms or households--especially those with short-term or floating rate debt. But whether cash flow strains or actual defaults would result in different patterns of spending behavior than observed in past cycles isn't entirely clear. For example, it is often argued that institutional and legal changes make restructuring of financial obligations easier. Nonetheless, one cannot rule out the possibility that a higher rate of defaults could influence confidence more generally and have broader systemic effects.

With this caveat in mind, we now turn to Peter Hooper, who will discuss the effects of several possible impediments to achieving zero inflation over the next five years.

Alternative Exchange Rate Assumption

The estimates of the costs of reaching zero inflation that Dave and Larry have discussed assume that economic conditions over the next five years will be relatively favorable for achieving that goal. As was noted earlier, we have assumed that there will be no autonomous drop in the foreign exchange value of the dollar, that there will be no adverse

supply shocks, and that we will continue to see steady progress toward balance in the federal budget. Of course, there is always the chance that something will go wrong along the way. I shall consider how the monetary restraint needed to eliminate inflation and its associated effects might be influenced by less favorable outcomes for some of these variables. In doing so, I'll be presenting estimates based on simulations with the Board model that Larry discussed.

The first less favorable assumption concerns exchange rates, as shown in exhibit 11. In the base-case disinflation scenario we assumed that dollar exchange rates would not be directly influenced by the U.S. external deficit. That is, exchange rates were assumed to move principally in response to changes in interest rates and inflation rates. As indicated by the solid line in the top panel, the dollar appreciates for several years in the base case as anti-inflationary monetary policy pushes real interest rates in the United States up relative to rates abroad. The base-case scenario also projects a persistent U.S. external deficit, which is assumed not to affect the dollar.

At some point, however, the mounting U.S. external debt to foreigners could begin to influence the willingness of international investors to hold additional dollar assets. As you know, this has been one of the tenets of our Greenbook exchange rate projection, and it is the basis for the alternative shown by the dashed line. Under the assumption that the willingness to accumulate dollar assets declines over time, the average value of the dollar against G-10 currencies falls

at a rate of about 6 percent per year relative to the base-case path, reaching a level nearly 30 percent below that path by 1995.

The lower dollar exchange rates have a significant inflationary effect through both higher import prices and increased demand pressures created by stimulus to net exports. In order to offset these additional pressures on inflation while still achieving the objective of zero inflation by 1995, money growth is tightened more than in the base case. One index of the extra monetary restraint is the greater increase in real interest rates relative to the base-case path. This can be seen by comparing lines 1 and 2 in the panel below, which show that by 1995, the real Treasury bill rate, at a level of 7 percent, is 3 percentage points above the base case.

The rise in real interest rates depresses private domestic expenditures, especially investment, by enough to more than offset the stimulus to net exports from the lower dollar. Real GNP growth, line 3, falls somewhat relative to the base case, particularly during the last three years of the simulation period, and the unemployment rate (line 5) rises above the base case, to a range of 7-1/2 to 7-3/4 percent after 1992. In this scenario, the additional degree of slack in the economy is needed to offset the inflationary effects of rising import prices.

The weaker dollar does result in a significantly lower current account deficit measured as a percent of nominal GNP, as shown in line 7. By 1995, the improvement in the current account relative to the base case amounts to 1 percent of GNP or roughly $70 billion. This improvement would be noticeably greater if the higher interest rates in

this scenario were not also raising U.S. debt service payments to the rest of the world.

Supply Shocks

Your next exhibit presents the effects of a representative supply shock. Our base-case assumption (the solid line in the exhibit) is that oil prices in real terms remain unchanged. Deviations from this assumption are plausible in both directions. However, the growing concentration of world oil production and reserves in OPEC countries and prospects for continued growth of demand in consuming countries raise the possibility of an upward adjustment in the relative price of oil at some point. Our alternative assumption here is that real oil prices double between 1992 and 1994, and remain unchanged thereafter. This is a very large increase, but still leaves the real price of oil $6 per barrel below its average during the first half of the 1980s.

Achieving zero inflation in the face of higher oil prices again requires some additional monetary restraint. As indicated in line 1 in the table below, by 1995, the real Treasury bill rate is pushed up one percentage point above the base case. The oil price shock also results in significantly weaker domestic activity. From 1992 on, real GNP growth (line 3) remains noticeably below the path in the base case. And the unemployment rate (line 5) eventually rises to 8 percent.

Alternative Fiscal Policy

The third alternative assumption we consider is fiscal policy, as shown in exhibit 13. Our base-case assumption (shown by the solid line) is that the full-employment budget deficit will decline steadily,

through reduced government expenditures, to zero by 1995. Recent geopolitical developments and the resultant possibility of deep cuts in defense expenditures suggest that this path might now be more easily attained. But with many potential competitors for any "peace dividend," it is worthwhile to consider an alternative case in which the full employment deficit remains unchanged as a share of GNP. Here we assume that the deficit persists at about 2-1/2 percent of GNP, or roughly $130 billion at current income levels.

In contrast to the examples of a weaker dollar and higher oil prices, the easier fiscal policy in this scenario affects inflation primarily through its stimulus to aggregate demand. Achieving zero inflation, therefore, requires raising real interest rates enough to offset that stimulus and keep GNP and the unemployment rate roughly unchanged from their base-case paths. The simulation results in lines 1 and 2 below show real short-term rates rising steadily above the base case, and by 1995 exceeding the base-case path by 2-1/2 percentage points.

While the level of total output is not greatly affected in this scenario, the combination of fiscal stimulus and higher interest rates does produce a significant shift in the composition of GNP. In order to make room for the higher level of government expenditures at unchanged GNP, housing, business fixed investment, and net exports are crowded out strongly.

The actual budget deficit in this scenario (shown in line 7) rises well above the assumed full-employment level of 2-/1/2 percent of

GNP. This is because of both the shortfall of GNP from potential and the high real interest rates associated with the move to zero inflation. Even at a level of 4.6 percent in 1995, however, the ratio of the deficit to GNP would still be less than its peak levels of earlier in the 1980s.

Summary of Alternative Scenarios

The alternative scenarios we chose to present here involved less favorable circumstances, in part because more difficult decisions would have to be made if something goes wrong than would be the case if events turn out more favorably than expected. One also could argue that the odds are somewhat greater on the negative side at this juncture. Nevertheless, there is some chance that we could see a stronger dollar, a fall in real oil prices, or even, with some stretch of the imagination, a budget surplus. To a first approximation, the estimated effects of the shocks presented here could be reversed in sign if one wished to estimate the implications of a correspondingly more favorable set of outcomes.

A summary of the simulated costs of achieving zero inflation under the alternative scenarios I have discussed is presented in exhibit 14. The first column of numbers shows the cumulative shortfall of the level of GNP from potential over the next six years, expressed as a percent of potential GNP. The second column shows the cumulative excess of unemployment relative to an assumed natural rate of 5-1/2 percent, and the third column shows sacrifice ratios, which were

calculated by dividing the numbers in column 2 by the 3.9 percentage point reduction in inflation over the period.

Relative to the base case (shown in line 1), achieving zero inflation with the weaker dollar (line 2) involves a greater loss of output and employment and a higher sacrifice ratio. Losses in the scenario with higher oil prices (line 3) are greater still. Nevertheless, the differences between these two scenarios and the base case are considerably smaller than the estimated costs of disinflation under the base case itself. The costs associated with the unchanged budget deficit scenario do not differ appreciably from the base case, and if anything, appear to show slightly smaller losses in employment. Keep in mind, however, that the level of private investment is depressed in this case, which would have more negative implications for the longer run.

Let me turn the presentation back to Larry now for some closing remarks.

Strategic Issues

In closing our presentation, I would like to touch on a key strategic issue. As shown by the solid lines in your final exhibit, although the base-case simulation produces a steady deceleration of inflation throughout the first half of the 1990s without generating a recession, it ends with the unemployment rate at 7 percent in 1995--roughly 1-1/2 percentage points above our estimate of the natural rate of unemployment. If unemployment were to remain at that level, in fairly short order it would lead to outright deflation. Thus, in the

case of a gradual deceleration of inflation with no credibility effects, the economy would continue to pay a price beyond the five-year horizon in the form of excess unemployment and deflation.

Consequently, we conducted an alternative experiment. In this simulation, we used the Board model and searched for a money path that would both produce approximately zero inflation in 1995 and also return the unemployment rate to a level close to the natural rate. The results of this simulation are shown by the dashed line in the exhibit. This alternative experiment requires a more aggressive tightening of monetary policy early on, and generates a small recession in 1990. As a consequence, the unemployment rate peaks in 1992 at a level about one percentage point higher than in the base case, but then falls rapidly during the subsequent three years. In the scenario, the sacrifice ratio would be about 2-1/2, only a bit higher than the 2.2 ratio in the base-case scenario. I should note that the upward movements in real interest rates in both of these simulations would cause the dollar to appreciate, which would augment the disinflationary forces emanating from reduced domestic cost pressures.

Conclusion

We have presented a large number of simulations this afternoon based on three different models. At this point you probably are wondering: what is the bottom line of our presentation? We can't give you a single bottom-line answer, since the acceptance or rejection of a particular simulation depends on one's views about such things as credibility effects and the way expectations are formed, and on one's

willingness to accept a possible recession, among other things. However, the one thing we can say is that all of the models and simulations indicate that if inflation is to be eliminated within five years, money growth will have to slow. Moreover, unless credibility effects are quite strong, the slowdown in the growth rate of money will generate higher real rates and a sizable increase in unemployment. Indeed, under most scenarios, increases in the unemployment rate of about a tenth of a percentage point per month could be expected for at least the next year or two.

STRICTLY CONFIDENTIAL (FR) CLASS I–FOMC

Material for

Special Presentation to the Federal Open Market Committee

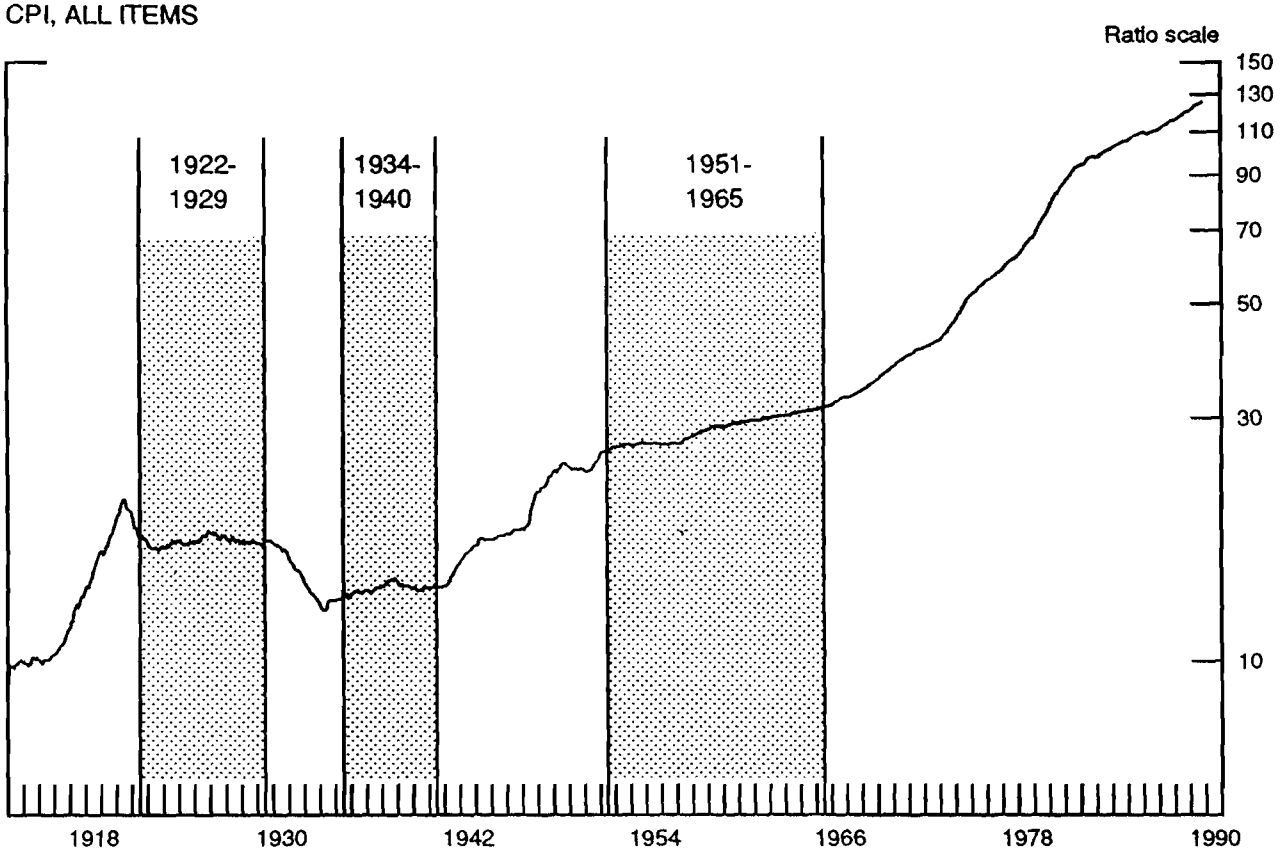
December 18, 1989

Outline of Presentation

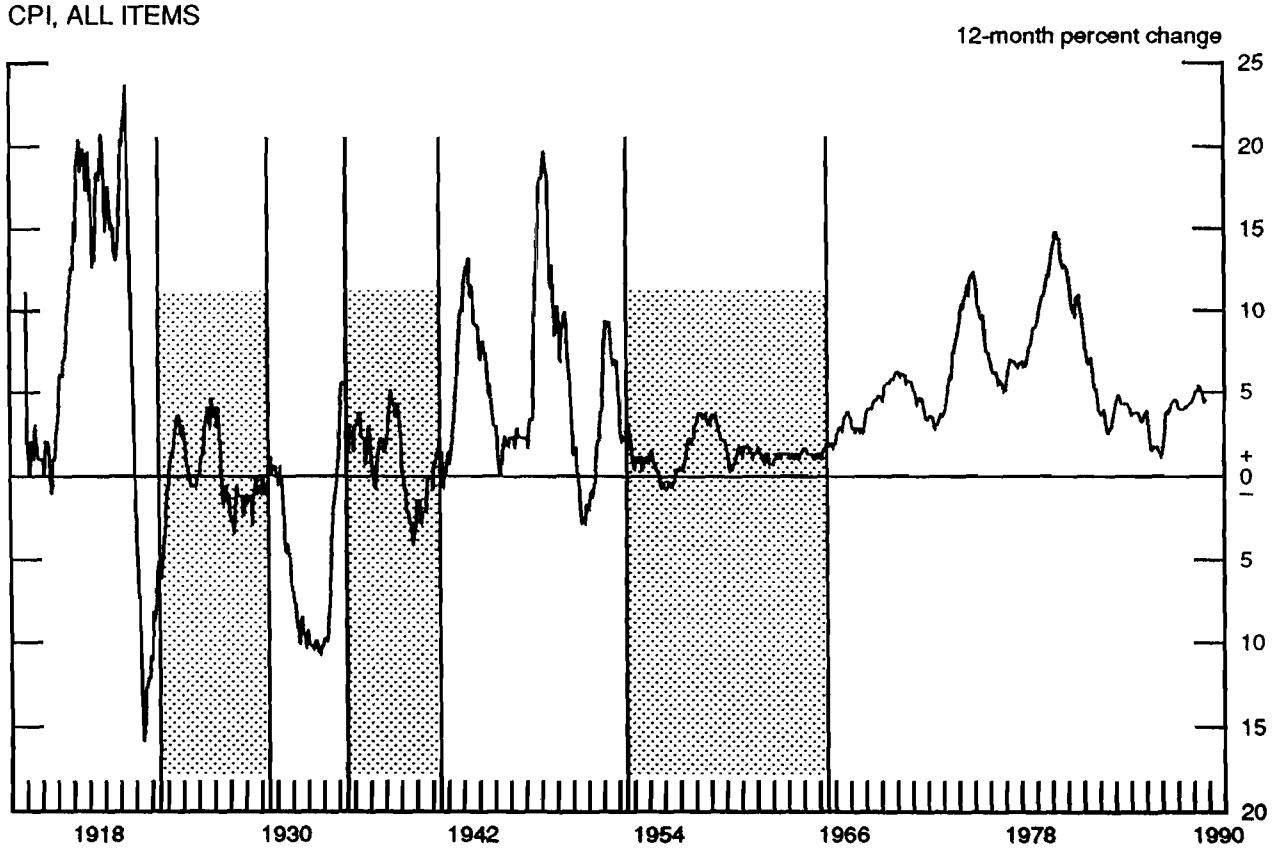
- The long-run relationship between money and prices
- Factors influencing the cost of disinflation
  - — Difficulties of reducing inflation expectations
  - — Establishing and maintaining the credibility of the central bank
- Econometric model simulations with different degrees of central bank credibility
- Possible impediments to price stability in five years
  - — Persistent downward pressure on the foreign exchange value of the dollar
  - — A jump in world oil prices
  - — A less restrictive fiscal policy
- Comparison of alternative strategies for disinflation

Exhibit 2

CPI, ALL ITEMS



CPI, ALL ITEMS



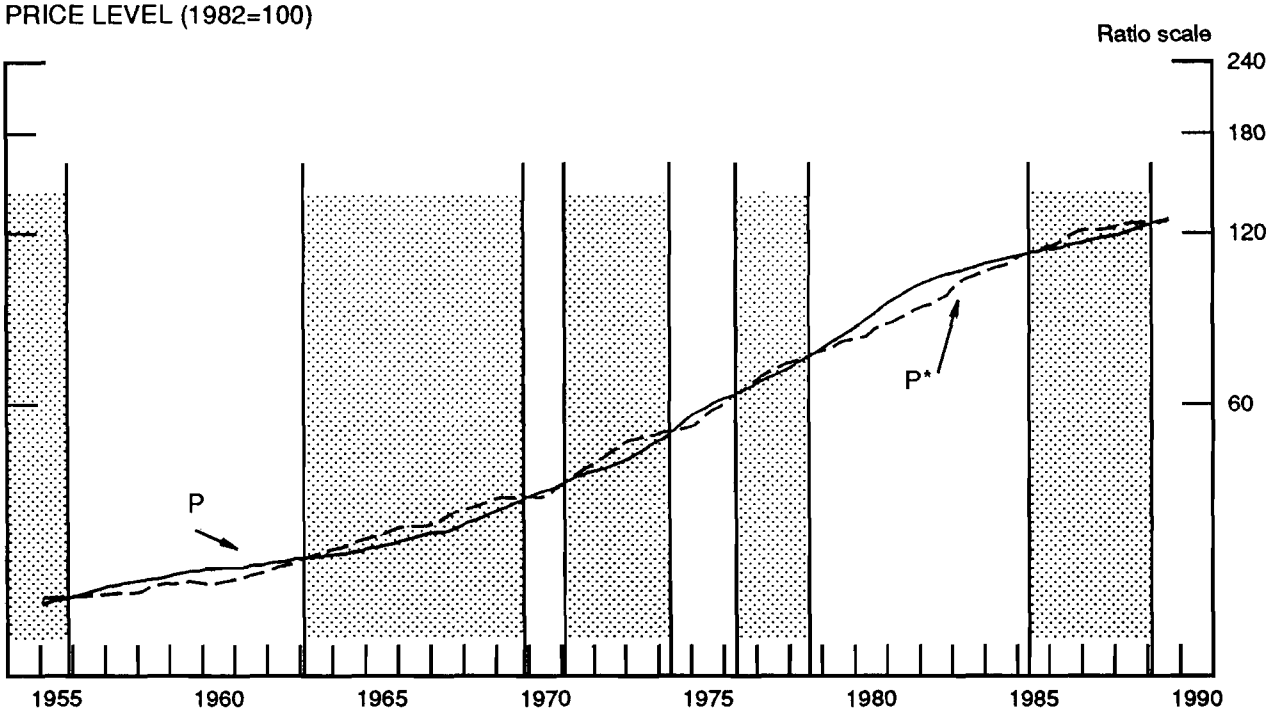
The P–star Model

(1) $P^* = M2 \bullet (V^* / Q^*)$

(2) $\pi_t - \pi_{t-1} = -\alpha (P_{t-1} - P^*_{t-1})$

P^* = equilibrium price level,
P = actual price level,
$M2$ = monetary aggregate,
V^* = historical average of M2 velocity,
Q^* = potential real GNP,
π = inflation rate.

PRICE LEVEL (1982=100)



GNP IMPLICIT PRICE DEFLATOR

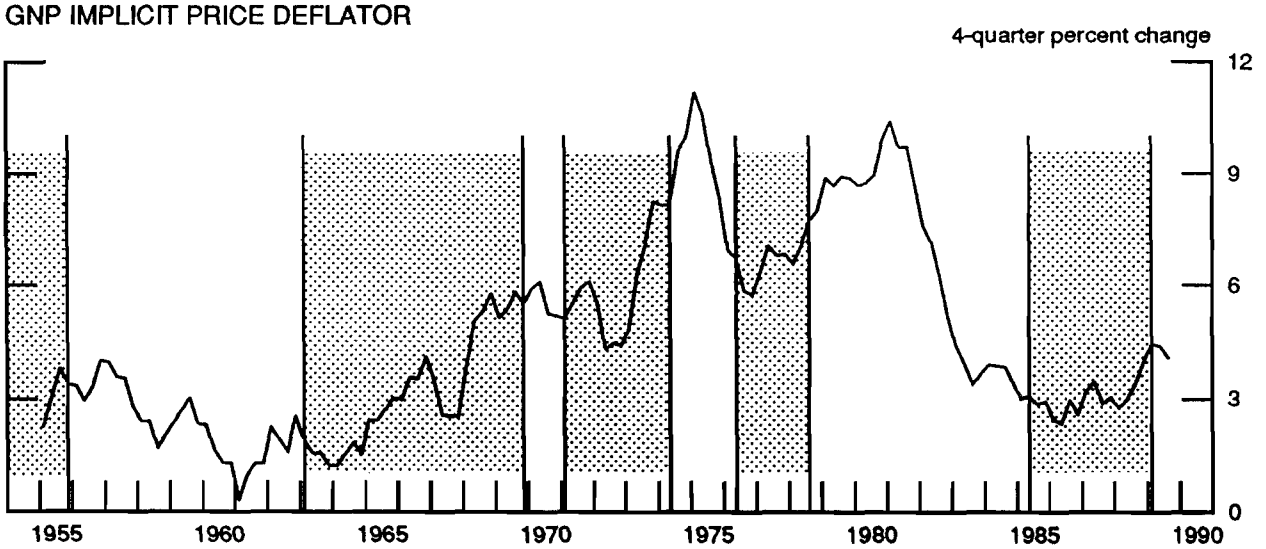
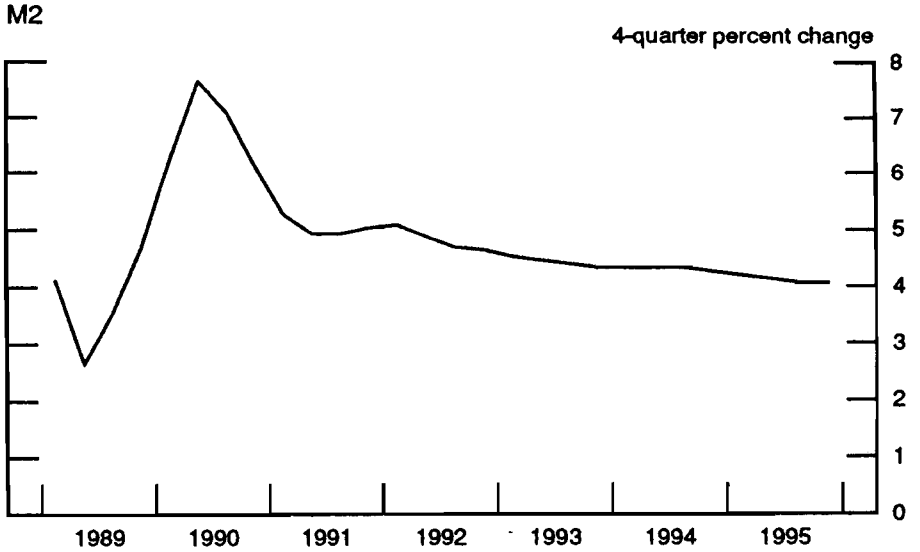


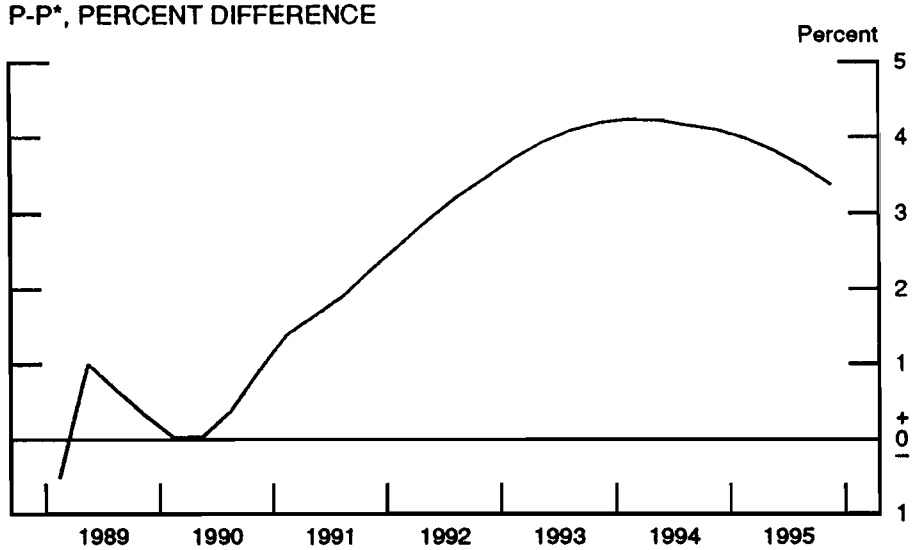
Exhibit 4

P-star Simulations

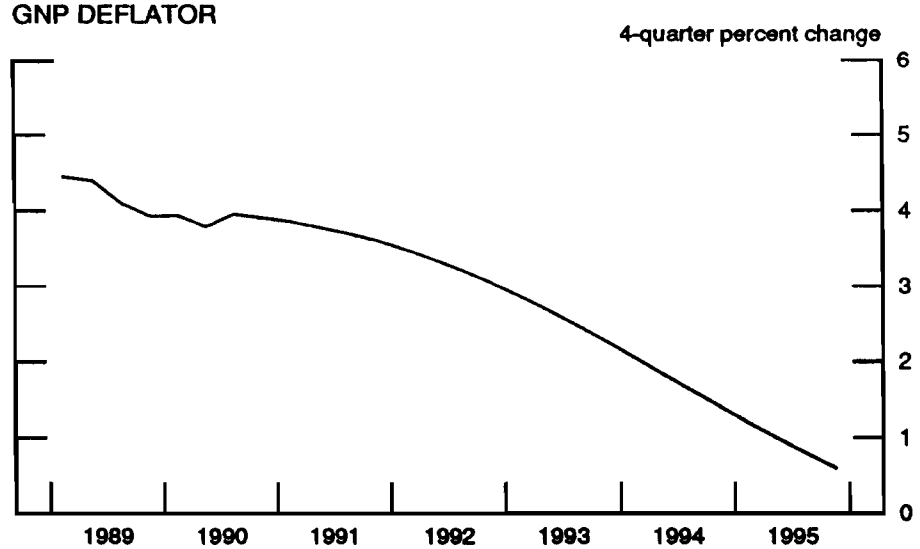
M2



P-P*, PERCENT DIFFERENCE



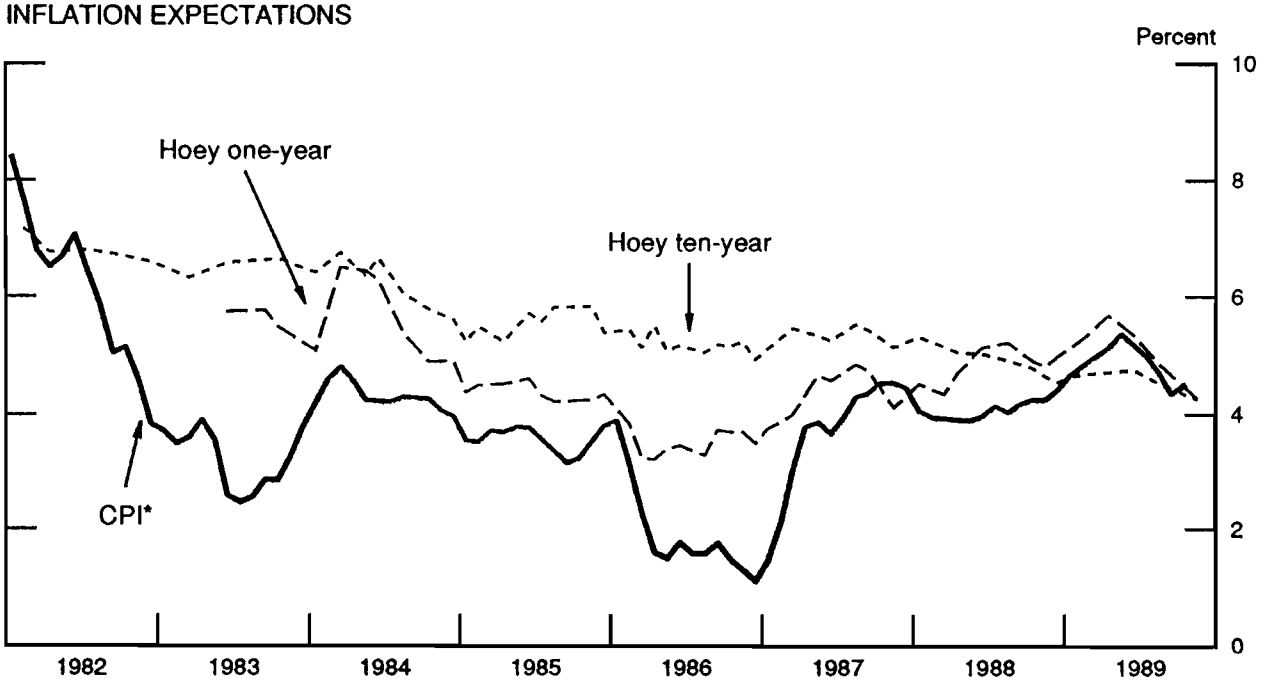
GNP DEFLATOR



Factors Influencing the Costs of Disinflation

- Nominal rigidities
  - — Wage and price contracts
  - — Costs of changing prices
  - — Decision lags
- Failure of inflation expectations to adjust correctly to changes in monetary policy

INFLATION EXPECTATIONS



* 12-month percent change

Alternative Hypotheses about Inflation Expectations

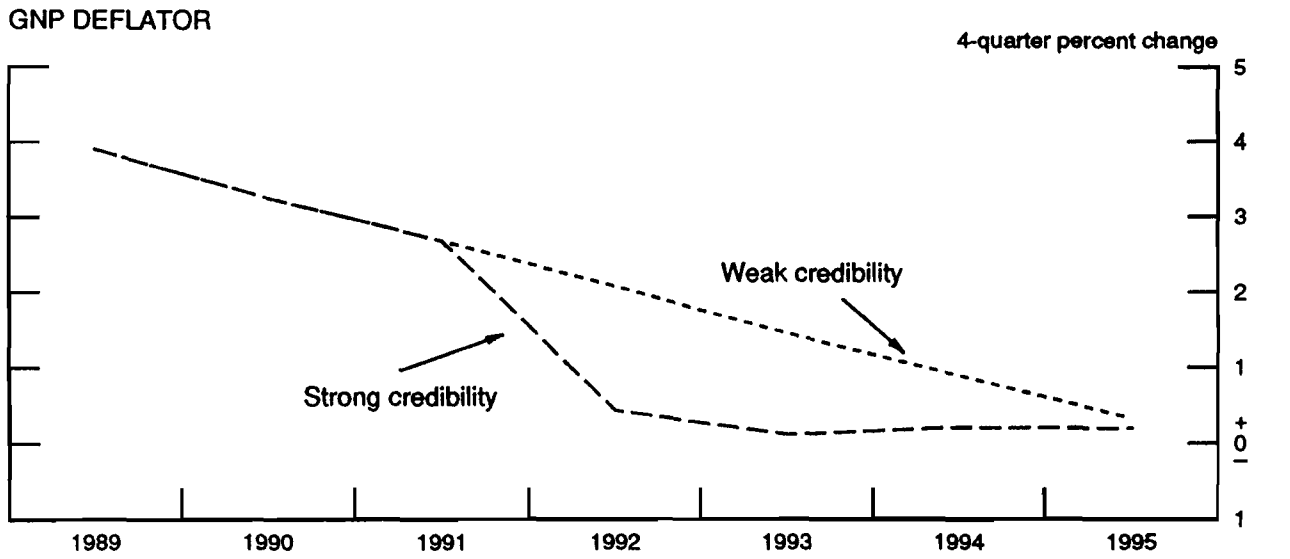
- FOMC **announcements** have complete credibility. Inflation expectations reflect current actions and announced monetary policy plans.
- FOMC **actions** have credibility. Inflation expectations reflect the observable actions of the FOMC, **but not announcements** concerning future intentions.
- FOMC actions and announcements have no direct effect on inflation expectations. Inflation expectations are formed by looking at past behavior of prices.

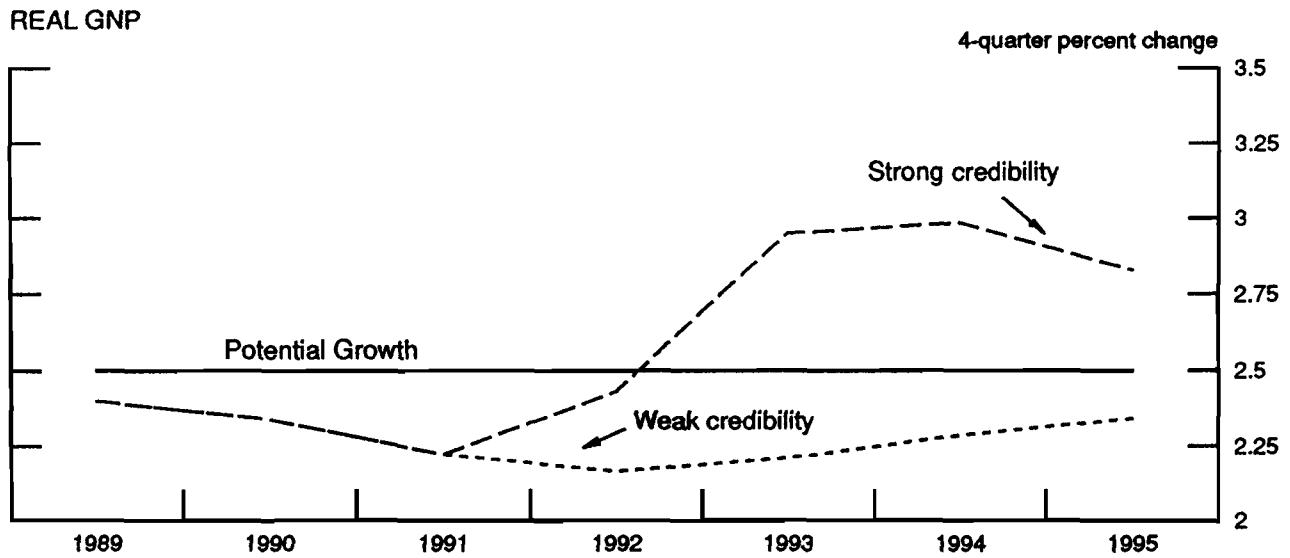
A Forward–Looking Model of the Economy

- Incorporates "rational expectations"
  - — Individuals are forward looking.
  - — Individuals understand the structure of the economy well enough to anticipate correctly the consequences of changes in monetary policy.
- Nominal rigidities
  - — Staggered contracts prevent immediate adjustment to unexpected changes in monetary policy.
- Assumptions about central bank credibility
  - — "Strong credibility"—After two years, wage and price setting behavior is altered on the basis of current actual and announced future changes in monetary policy.
  - — "Weak credibility"—Wage and price setting behavior incorporates current actual, but not announced future, changes in monetary policy.
- Additional assumptions
  - — In the absence of any significant change in real interest rates from current levels, the real foreign exchange value of the dollar would remain unchanged in real terms.
  - — Oil prices are constant in real terms.
  - — Full–employment Federal budget deficit is eliminated by 1996.
- Both simulations employ the same monetary policy.

Exhibit 7

Simulations of Forward-Looking Model





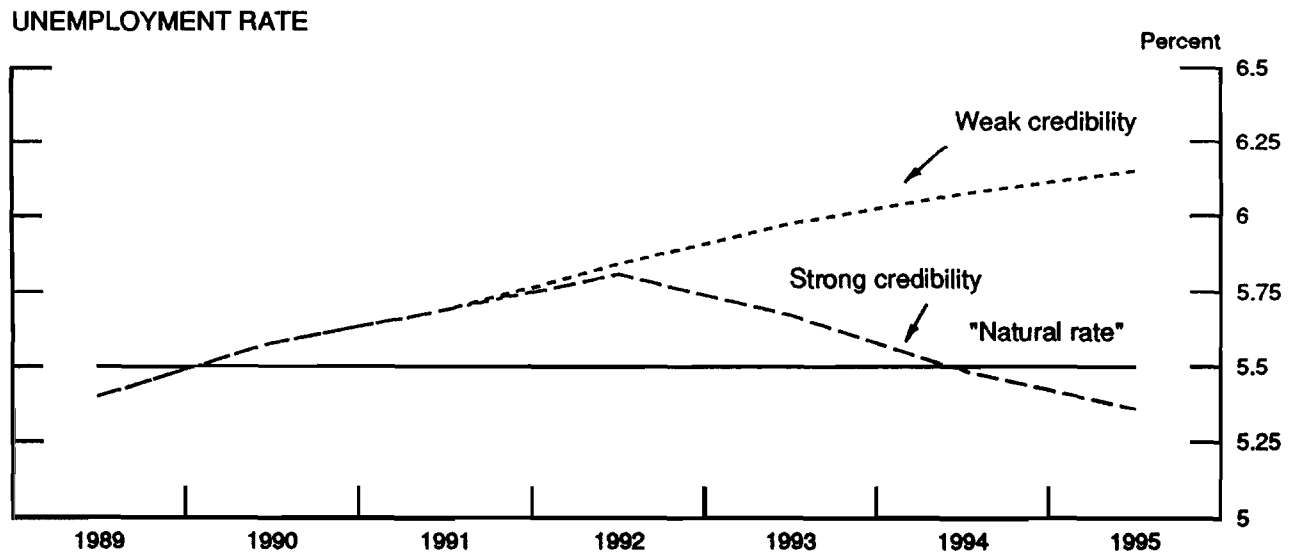
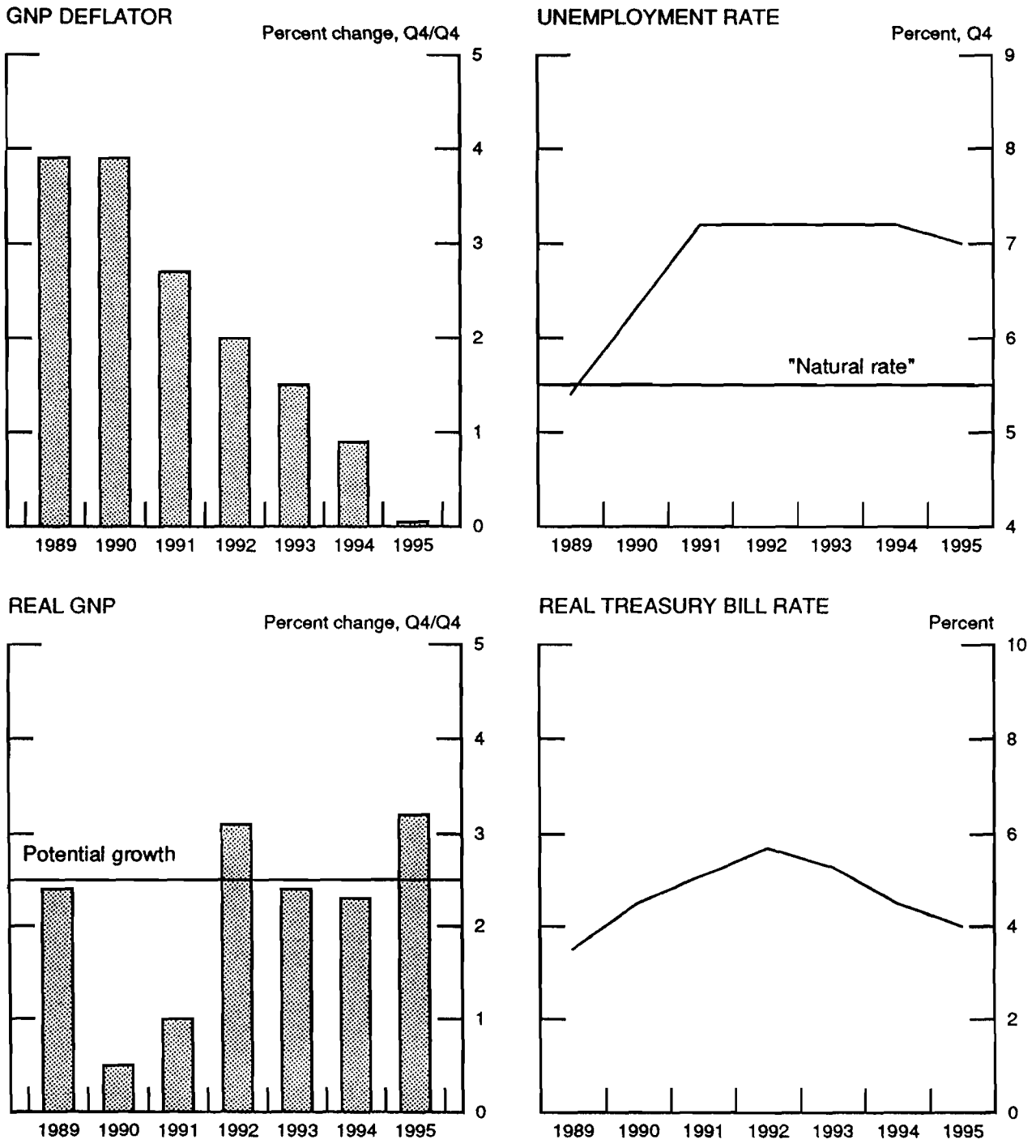


Exhibit 8

Zero Inflation Base Case



Sacrifice Ratios

		Change in inflation rate* (percentage points) (1)	Excess unemployment** (percentage points) (2)	Sacrifice ratio (2)/(1)
	Forward–looking model (1989–95)			
1.	Strong credibility	3.9	.7	.2
2.	Weak credibility	3.9	2.4	.6
3.	Board model (1989–95)	3.9	8.4	2.2
	Historical experience in U.S.			
4.	1957–61	2.6	7.1	2.6
5.	1970–72	.8	.8	1.0
6.	1975–77	3.1	6.8	2.2
7.	1981–85	6.7	11.8	1.8
	Foreign experience (1981–85)			
8.	Japan	1.2	2.6	2.2
9.	Germany	2.3	9.5	4.1
10.	France	7.1	5.8	.8
11.	United Kingdom	1.8	6.3	3.5
12.	Canada	7.5	13.5	1.8

* GNP implicit deflator

** Cumulative difference over the time period between the actual unemployment rate and the "natural rate" of unemployment.

Possible Factors Affecting the Realism of Model Simulations

- Increased global competition
- Heightened efficiency and cost consciousness on the part of business
- Diminished strength of labor unions
- Financial strains and financial fragility
  - — Our models are not equipped to shed much light on this case.
  - — A combination of higher real rates and weaker economic growth could affect highly leveraged firms or households.
  - — It is possible that more defaults could influence confidence more generally and have broader systemic effects.

GNP DEFLATOR

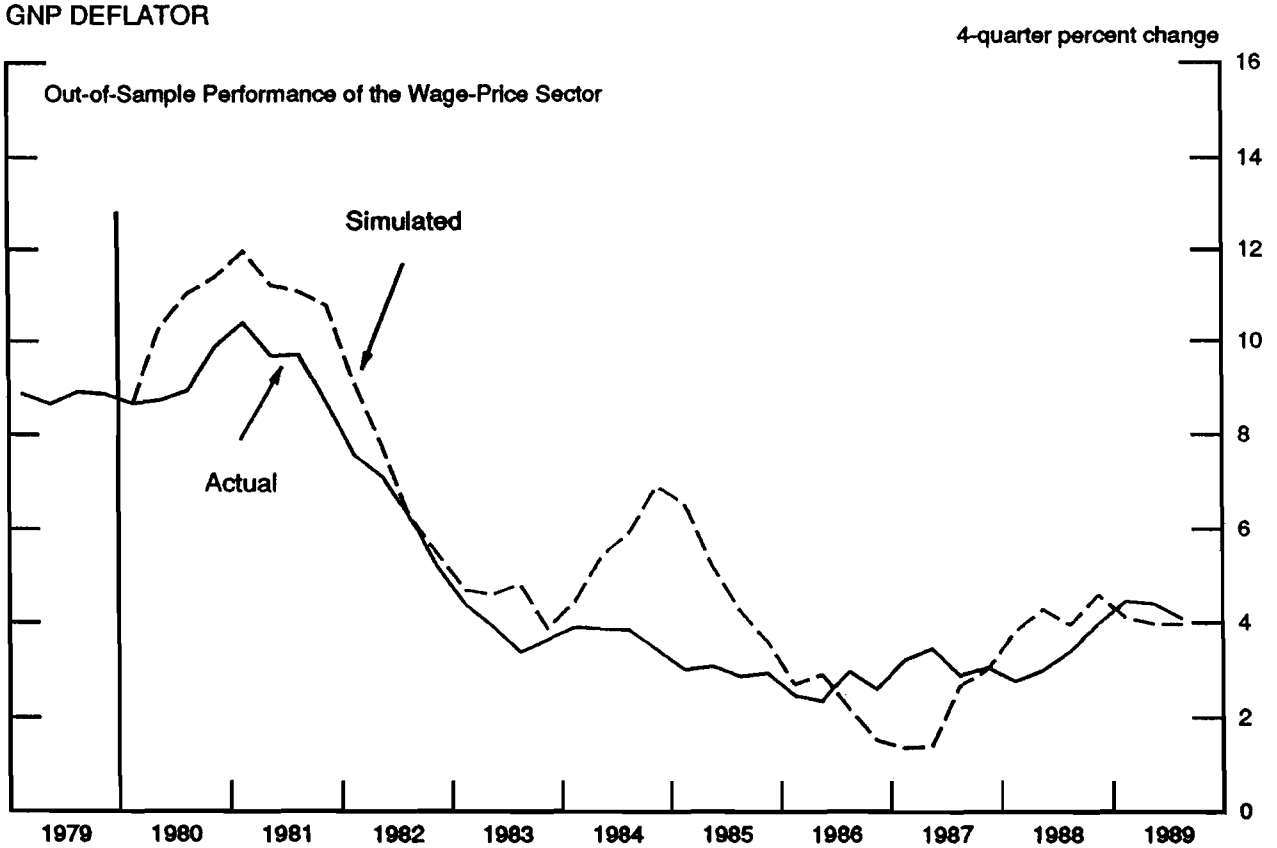
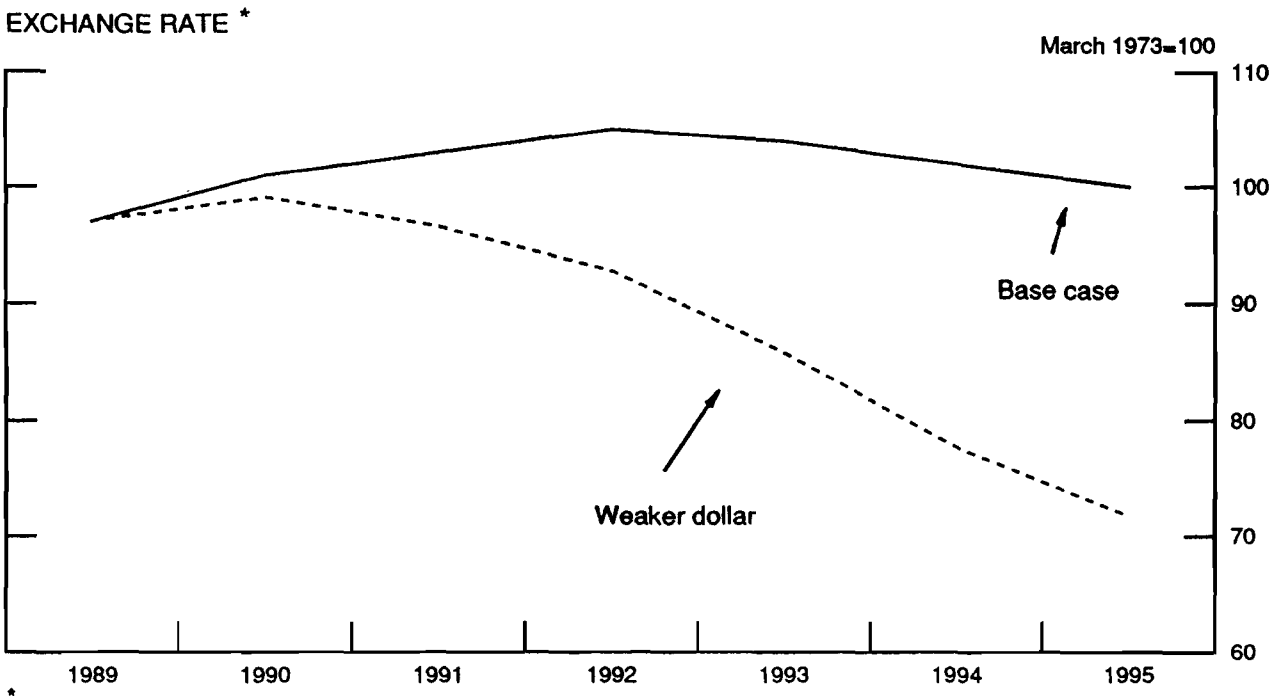


Exhibit 11

Alternative Exchange Rate Assumptions



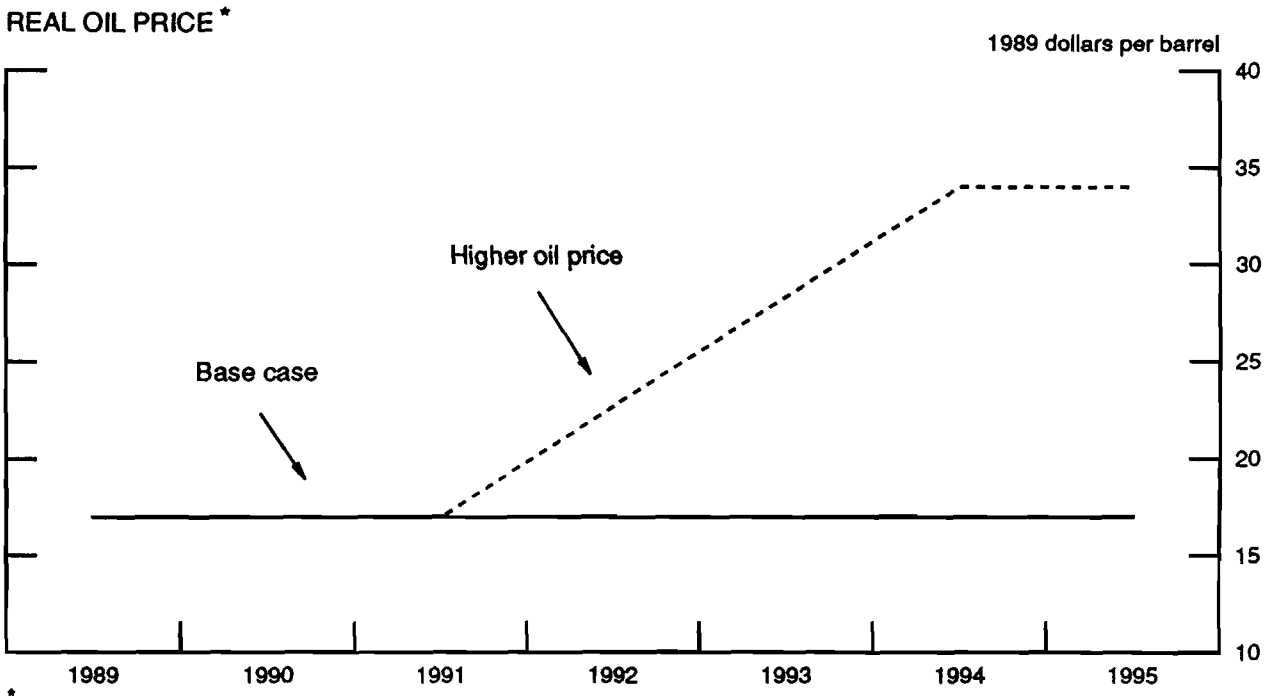
* FRB Index, G-10 currencies.

Weaker Dollar Exchange Rates

	1990	1991	1992	1993	1994	1995
1. Real Treasury bill rate (%)	4.8	5.4	6.3	6.4	6.3	7.0
2. *Base case*	*4.5*	*5.1*	*5.7*	*5.3*	*4.5*	*4.0*
3. Real GNP (% change, Q4/Q4)	.4	.9	3.0	1.6	2.0	2.7
4. *Base case*	*.5*	*1.0*	*3.1*	*2.4*	*2.3*	*3.2*
5. Unemployment rate (%)	6.3	7.3	7.3	7.5	7.8	7.7
6. *Base case*	*6.3*	*7.2*	*7.2*	*7.2*	*7.2*	*7.0*
7. Current account deficit (% GNP)	2.2	2.1	1.8	1.6	1.4	1.3
8. *Base case*	*2.2*	*2.4*	*2.4*	*2.3*	*2.3*	*2.3*

Exhibit 12

Alternative Oil Price Assumptions



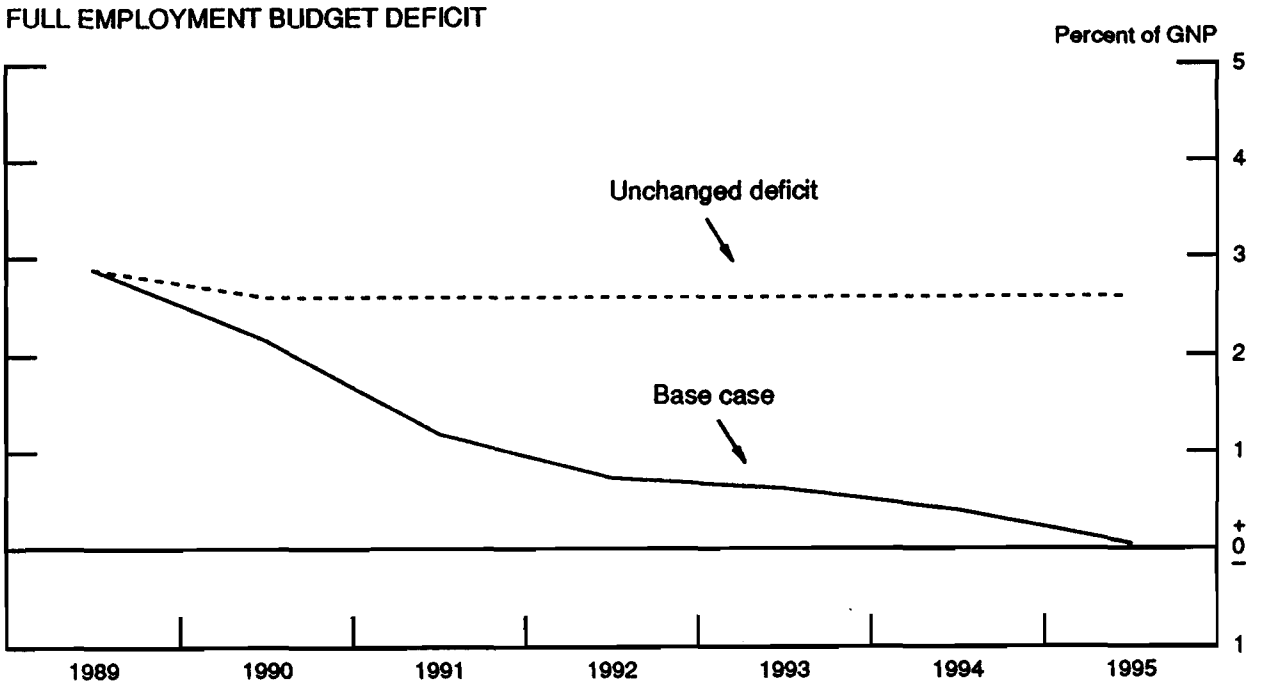
* US Import Price / CPI indexed to 1989=1.0.

Higher Oil Prices

	1990	1991	1992	1993	1994	1995
1. Real Treasury bill rate (%)	4.5	5.1	5.6	5.2	4.8	5.0
2. *Base case*	*4.5*	*5.1*	*5.7*	*5.3*	*4.5*	*4.0*
3. Real GNP (% change, Q4/Q4)	.5	1.0	2.7	1.5	1.6	2.6
4. *Base case*	*..5*	*1.0*	*3.1*	*2.4*	*2.3*	*3.2*
5. Unemployment rate (%)	6.3	7.2	7.3	7.6	8.0	8.0
6. *Base case*	*6.3*	*7.2*	*7.2*	*7.2*	*7.2*	*7.0*

Exhibit 13

Alternative Fiscal Policy Actions



Unchanged Full-Employment Budget Deficit

	1990	1991	1992	1993	1994	1995
1. Real Treasury bill rate (%)	5.1	6.1	7.2	6.7	6.5	6.5
2. *Base case*	*4.5*	*5.1*	*5.7*	*5.3*	*4.5*	*4.0*
3. Real GNP (% change, Q4/Q4)	.8	1.4	2.6	1.6	2.2	3.0
4. *Base case*	*.5*	*1.0*	*3.1*	*2.4*	*2.3*	*3.2*
5. Unemployment rate (%)	6.2	6.9	6.9	7.1	7.3	7.1
6. *Base case*	*6.3*	*7.2*	*7.2*	*7.2*	*7.2*	*7.0*
7. Budget deficit (% GNP)	2.9	3.0	3.1	3.8	4.3	4.6
8. *Base case*	*2.7*	*2.4*	*2.1*	*2.1*	*2.1*	*1.8*

Exhibit 14

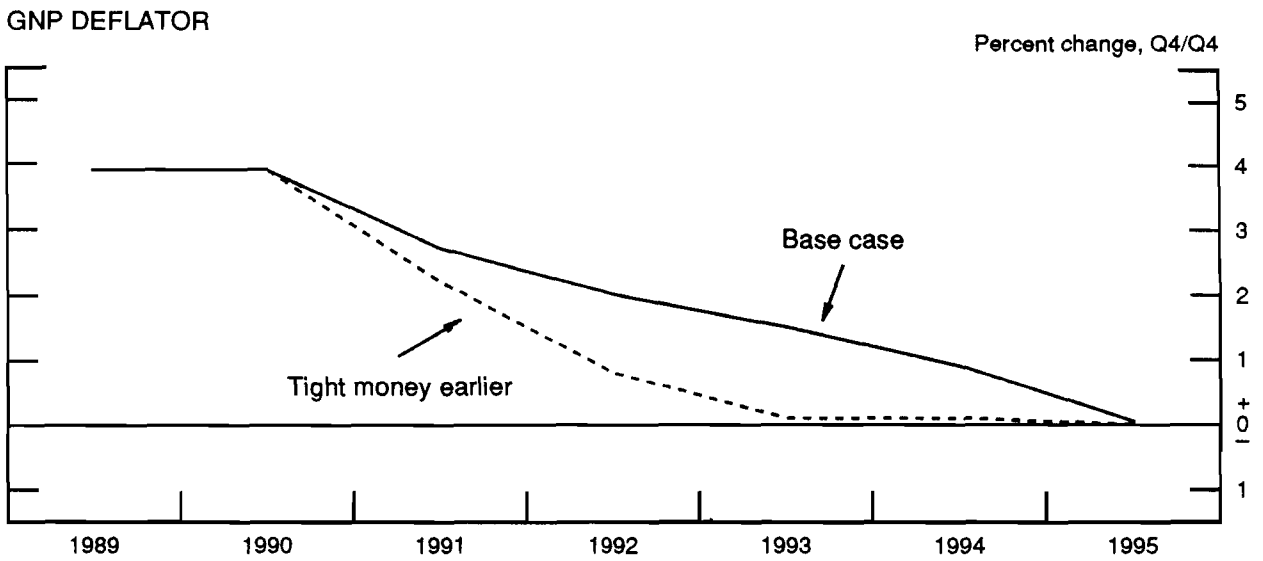
Costs of Achieving Zero Inflation Under Alternative Scenarios

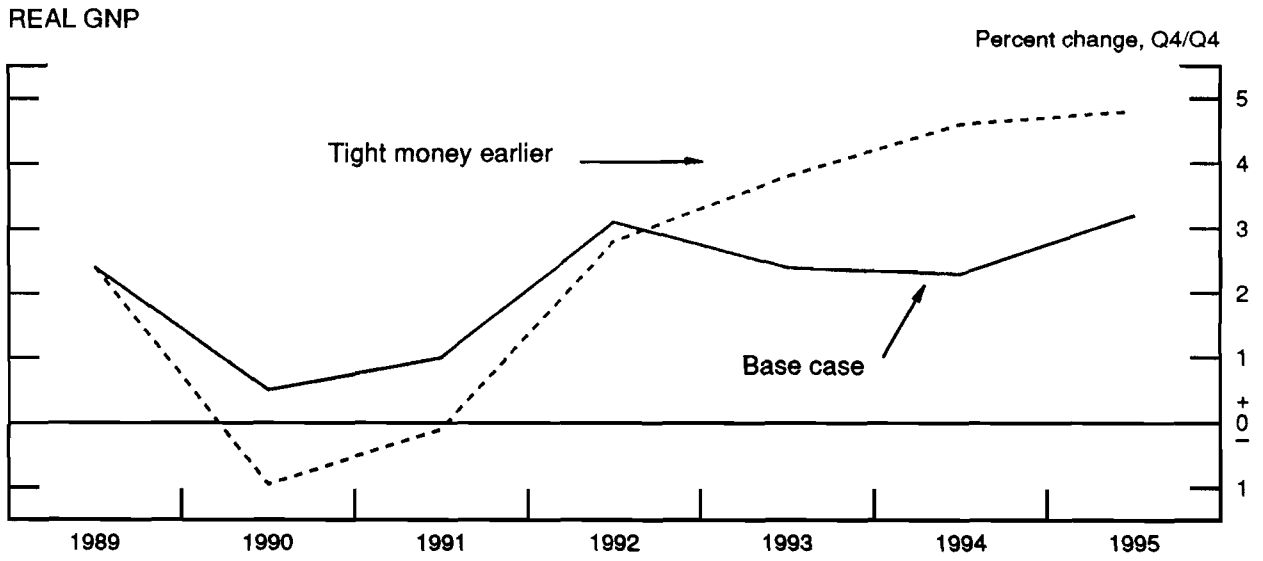
	Cumulative Losses 1989–95		
	Shortfall of GNP from potential[1] (percent) (1)	Excess of unemployment over natural rate[2] (percent) (2)	Sacrifice[3] ratio (3)
1. Zero inflation base case	20	8-1/2	2.2
2. With weaker dollar	24-1/2	9-1/2	2.5
3. With higher oil prices	25-1/2	10-1/2	2.7
4. With unchanged full–employment budget deficit	20	8	2.1

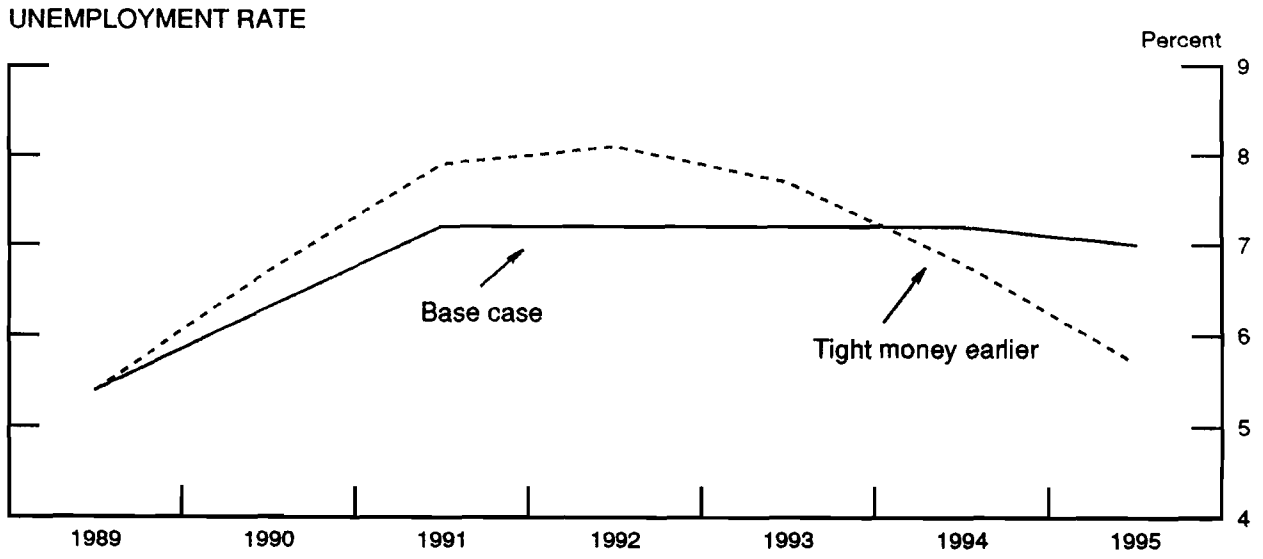
1. Calculated as the cumulative percentage gap between potential GNP and actual GNP from 1989 to 1995 .
2. Calculated as the cumulative gap between the actual unemployment rate and the natural rate (assume to be 5-1/2 percent) from 1989 to 1995.
3. Calculated as the cumulative excess of unemployment over the natural rate divided by 3.9 (the reduction in inflation between 1989 and 1995).

Exhibit 15

Alternative Policy Strategies







NOTES FOR FOMC MEETING
December 18-19, 1989

Sam Y. Cross

Since your last meeting, the dollar's movements against individual foreign currencies have diverged widely, with the dollar remaining firm against the Japanese yen while declining significantly, and at times sharply, against the German mark. Cumulative decreases in the dollar's interest rate advantage over the yen and mark since the spring finally seem to be taking their toll on the dollar. As a result, we have intervened on only two occasions, selling modest amounts of dollars against yen. The dollar's continuing decline against the mark has removed any need to intervene against that currency. The dollar is now trading marginally higher against the yen and about 6 percent lower against the mark than it was at the time of your last meeting.

Sentiment toward the U.S. economy has remained much as it was when you last met, with market participants looking for further evidence of softness in the U.S. economy and expecting signs of easing by the Federal Reserve. Statistics on the U.S. economy released during the inter-meeting period were scrutinized closely, but were seen in the exchange market as offering few new clues about the timing of the next decline in dollar interest rates. In the absence of new evidence to change expectations about U.S. interest rates, market attention turned to

developments overseas, particularly those occurring in Germany and Eastern Europe.

Around the time of your last meeting, a dominant sentiment in the market regarding Eastern Europe was one of apprehension. Although most observers believed that the West German economy would benefit in the long run from the inflow of skilled migrants into Germany from the East and the opening of East European economies to Western investment and exports, there was considerable nervousness about the possibility of civil disorder and conservative backlash. In this rather nervous environment, the mark gradually rose against all major currencies, but did so with some sense of hesitancy.

Over time, however, sentiment toward the German economy and the mark has turned more strongly positive, even euphoric, as developments in Eastern Europe have unfolded with little evidence of serious turmoil. Market participants have increasingly focused on the long-term benefits for the German economy and currency of the opening of Eastern Europe, especially East Germany. In particular, they have noted the stimulative effect on consumer spending and housing as a result of the inflow of new migrants, the greatly expanded market opportunities that West Germany would be uniquely positioned to exploit, and the expectation that German interest rates will rise further as the Bundesbank seeks to contain the resulting inflationary pressures.

In this environment, the mark has surged against all major currencies, reaching highs for the year against the dollar, the pound, and the yen, and putting pressure on its counterpart currencies in the European Monetary System. In fact, the mark has now surpassed levels at which the U.S. monetary authorities were intervening to support the dollar late last year, and this has given rise to rumors that the Desk was buying dollars against marks to resist the dollar's decline. However, David Mulford's comment in early December that the dollar's decline against the mark was "not alarming" has injected a note of uncertainty in to the market that the authorities would, in fact, be quick to support the dollar. And this has heightened market concerns that the dollar could decline still farther against the German currency.

Political developments, though less dramatic, have also been a focus of attention in Japan, with market participants expressing concern that political factors may be diverting energies from economic policy-making. In the October round of discount rate increases, the Germans moved soon enough and by a large enough amount to get ahead of the curve. The Japanese move, on the other hand, was seen as begrudging, too little and too late. Immediately after that Bank of Japan discount rate increase, market participants began to anticipate further increases in Japanese official rates. However, after U.S. rates

declined in early November, the Japanese authorities indicated through their domestic operations that no further policy tightening was on the agenda. The market views the Bank of Japan as having its hands tied until early next year, since a policy tightening is considered unlikely with a new governor and with elections expected in mid-February. In this environment, yen interest rates have eased in recent weeks and differentials favoring dollar over yen investments have actually widened back out a bit. And the yen has shown a tendency to decline against virtually all major currencies, the mark in particular.

Upward pressure on the dollar/yen exchange rate has been more moderate than it was earlier in the year, but on two occasions it was sufficient for us to enter the market to resist the dollar's rise. On these two occasions (November 20 and December 11) we sold a total of $150 million for the U.S. monetary authorities. Both of these operations were undertaken in response to Japanese urging, and to follow-up larger operations by the Bank of Japan. Still, dollar/yen exchange rates remain near levels prevailing at the time of the September Group of Seven meeting.

Recently, there has been growing uneasiness about the dollar. Market participants have noted that the dollar seems to have a greater propensity to decline on negative news than to rise on positive news. And, with rising interest rates abroad

and declining rates at home all but wiping out the interest rate advantage of dollar over mark assets, there is a sense that the dollar may be vulnerable to further declines against the mark and other European currencies.

Mr. Chairman, I would like to ask the Committee's approval for our operations during the inter-meeting period. The Federal Reserve share of the Desk's activity was a sale of $75 million against yen.

I would also like to raise with the Committee the question of our limits on the System's foreign currency holdings. In the past two months, we have intervened very modestly on only two occasions, once for $50 million, once for $100 million. On a number of occasions, with the help of the Chairman and others, we have succeeded in dissuading the Treasury from intervening when they were eager to do so. I think the record during this period has been pretty good. We have prevailed in these discussions with the Treasury much of the time.

Even so, we are now just $350 million below our limit of $20 billion in foreign currency balances. Assuming there is no intervention by the Desk on either side of the market, with the normal accumulation of interest, we would reach that limit in February. As you know, we have a Task Force looking into intervention which is scheduled to report in March, and this is a

difficult time to propose a change. Nonetheless, it would seem to me that, pending the review of these matters next spring, the Committee should provide for a modest increase in the limit, not only for prudential reasons, but also for technical reasons so that we can accommodate the expected interest receipts. I would hope that the Committee would find this the best approach or in any case the least worst of the possibilities in the circumstances. Accordingly, I would recommend that the FOMC limit on foreign currency balances be increased by $1 billion to $21 billion.

FOMC NOTES
PETER D. STERNLIGHT
DECEMBER 18-19, 1989

Domestic Desk operations since the last meeting of the Committee have been aimed at achieving unchanged pressures on reserve availability, with an expectation that Federal funds would trade largely in the area of 8 1/2 percent. That has been the level sought since early November, about a week before the last meeting. Through most of the period, this degree of pressure was associated with a path level of $200 million for adjustment and seasonal borrowing, incorporating a $50 million downward technical adjustment as the period began, in recognition of recent declines in seasonal borrowing. With seasonal borrowing receding further as the period progressed, another downward technical adjustment of $50 million, to $150 million, was made in the path borrowing level a week ago.

A significant difficulty in implementing policy was encountered in the days surrounding the Thanksgiving Day holiday, when market participants first misunderstood a needed seasonal injection of reserves as a probable policy easing and then mistook the Desk's initial effort to correct this misimpression as merely confirming the size of the easing step. A newspaper article purporting to provide official confirmation of an "easing," which appeared the day after Thanksgiving, contributed strongly to the markets' misconstruction. Only after an aggressive reserve-draining action the following Monday, just after a Committee conference call, was the market disabused of its error.

At the Desk, we have asked ourselves many times since November 22 whether market participants had reasonable grounds for their conclusion that the System had eased. My own judgment is that they had grounds to question if a change might be under way, but not to reach a firm conclusion--at least not until the aforementioned news article appeared to provide official confirmation. From our own standpoint, what we faced on November 22 was a large reserve need--averaging nearly $4 billion per day for the remaining 8 calendar days of the maintenance period. Accumulated excess had been low up to that point and sizable daily deficiencies were projected starting that day. Moreover, the next business day--the day following Thanksgiving--was expected to be thinly staffed in the market. We expected that dealers would try to wrap up financing on the 22nd, thus avoiding the need to re-finance on the 24th. Hence, there might not be much opportunity to arrange a sizable reserve injection on the latter date--and that could leave a huge need and undesirably tight money market after the weekend. All this argued for injecting a healthy dose of reserves. The other side was that funds were trading fairly comfortably at 8 7/16 percent over most of the morning. Around 11:30 a.m., the funds rate edged down to 8 3/8 at two of the major brokers--just minutes before the Desk entered to arrange five-day System RPs to carry through the post-holiday weekend. The change to 8 3/8 percent trading was so close in time to our market entry time that some of the subsequent market reports were that funds were still at 8 7/16 when we went in.

The market had mixed views that morning of what the Desk might do. Analysts were generally aware of a sizable seasonal reserve need. Some had even looked for an earlier outright market purchase. Our round-up of market expectations, done when funds were trading at 8 7/16, showed a number of participants anticipating no action essentially because of the comfortable money market. A fair number of others looked for a two-day customer RP. A few, impressed with the reserve need, said they expected System RPs, either two-day or five-day. Market participants had also been telling us they looked for another System easing perhaps a few weeks away; but we were not hearing talk of an immediate move.

In choosing to do the five-day System RP, we recognized that some observers might think another easing could be under way, but we expected the more prevalent interpretation to be that five-day operations at a time of known seasonal needs are most likely addressed to technical reserve shortages. By past experience, the operation would hardly warrant a conclusion that the System had eased. We believe it was reasonable to expect suspicions of possible easing to await confirmatory evidence.

Clearly, we misjudged the market's reaction, even as of Wednesday afternoon. By Friday, of course, the ill-founded newspaper article had cemented in the wrong market conclusion. In retrospect, a few factors may have contributed to the market's over-hasty conclusion on Wednesday: first, staffing at the dealers seems to have been thin; at least we heard later from some more seasoned observers that they had not been around and later had been

surprised at the market's quick reaction. Second and most important, I think there was a collective market hunger for an easing move--even though intellectually it was not expected for another few weeks. Recent dealer purchases apparently worked to encourage an optimistic reading. It has been a poor profit year for most dealers, and a Fed move could be a welcome opportunity to make up lost ground. Besides, the Fed had surprised the market with its timing in early November so this could be another surprise. Possibly, some weakness in the durable goods orders reported Wednesday morning contributed to anticipations of easing, although the numbers did not seem out of line with market expectations. Finally, the further softening in the money market Wednesday afternoon contributed to the market's conclusion, though this was a mixture of cause and effect as a sense of possible easing probably caused some funds market participants to slacken their buying which in turn strengthened the sense of an ongoing easing.

The day after Thanksgiving we sought to repair the damage by draining a small amount of reserves, even though projections still pointed to a need to add reserves for the period. Unfortunately, the funds rate slipped from 8 1/4 to 8 3/16 percent just a couple of minutes before our entry, so we were seen as resisting rates <u>below</u> 8 1/4 percent rather than the 8 1/4 level itself. The big obstacle to correcting misimpressions on Friday, though, was the aforementioned newspaper article supposedly giving official confirmation to an easing. By Monday, with the funds rate just a little firmer, 8 5/16 percent, we were able to make a strong

point by draining a moderate amount of reserves early in the day. By now, moreover, the reserve shortage we had been concerned about all along began to make itself painfully evident. Funds trading moved up to the 8 1/2 percent area on Monday, and a few large banks came to the discount window. On Tuesday, facing a large reserve need and with funds trading a little above 8 1/2 percent, the Desk arranged over $9 billion of two-day RPs, executing nearly all the proposals presented to us. Another $4 1/2 billion of overnight RPs was arranged the next day, the final day of the reserve period, in a firm money market. Borrowing bulged somewhat on that day as well, at least partly reflecting a shortfall of reserves from projected levels.

Taking that full reserve maintenance period, funds averaged very close to 8 1/2 percent, running lower when the market veered to its wrong conclusion but higher in its final days when the large reserve need showed through along with the message that policy had not changed. In the second full reserve period funds held fairly close to 8 1/2 percent, though tending a shade below through much of the interval and thereby causing the Desk to be somewhat laggard in meeting the full reserve need. With a fairly firm final day, funds averaged exactly 8.50. That has also been the predominant rate so far in the current period.

Borrowing exceeded the $200 million path allowance in the first reserve period, as cumulated reserve needs piled up near the end of that period--especially on the Monday that we deliberately extracted some reserves on a day that reserves were already scarce,

in order to deliver our "no change" message. In the next period borrowing ran lighter than path through much of the period, and toward the end of that period, as noted, a downward technical adjustment was made in the path. Borrowing turned out a shade below the lowered path level for the full two weeks. So far in the current period borrowing is a little above path.

Outright operations in the intermeeting period were all on the reserve-adding side, including a record-size market purchase of $4.5 billion of bills on November 29. This was supplemented by $2.2 billion of bills purchased from foreign accounts over the course of the period. Both repurchase agreements and matched sales were employed in the first reserve maintenance period, as already described. In the second period, outright purchases were supplemented by repurchase agreements, although overt action was deferred at times when funds slipped under 8 1/2 percent, lest the market get confused again.

Looking at the Desk's outright operations so far this year, the period has been rather unusual. Instead of the typical large annual addition to outright holdings--these ranged from about $9 to 21 billion over the five previous years--the System's outright portfolio of Treasury and Federal agency securities is <u>down</u> about $11 1/2 billion since the start of this year. Bill holdings are down about $12 1/2 billion, while Treasury coupon issues are up by somewhat over $1 billion. A major reason for the change this year is the System's large increase in foreign exchange holdings--either for our own direct account or in connection with

warehousing of Treasury foreign currency holdings. In addition, reflecting the lack of net growth in narrow money supply, currency outstanding is up less than in recent years and required reserves show relatively little change.

Yields on most fixed income securites fell modestly over the interval, against a background of business news that was seen as predominantly on the soft side, though intermixed with a few stronger than expected reports. There was some tendency for the "latest" numbers to come in fairly strong, but accompanied by downward revisions for earlier months which left market observers uneasy as to the "real" situation. Still, there remained an underlying view that the economy is softening and that policy is likely to undergo further easing steps in the months ahead--though with considerable backing and filling of views as to the timing and size of particular moves. Net over the period, Treasury bill rates came off by about 10 to 20 basis points. Treasury coupon issues out to about 10 years were down in yield by 5 to 15 basis points, while longer-term Treasuries edged off a mere 2 to 5 basis points.

Within the period, there was a flurry of rate declines in the days surrounding Thanksgiving when market participants thought policy was easing slightly, and then a quick reversal of these declines when Desk action made it clear that no policy move had occurred, but even these changes were not large. The swings were on the order of 8 to 15 basis points for short and intermediate issues and only about 2 to 4 basis points at the long end.

Activity was reportedly light in the Government market, partly for seasonal reasons and partly, one heard, because participants felt confused and even abused by the nature of Desk actions and reported official comments on the economy and policy.

The Treasury raised about $10 billion in the bill market through regular cycle issues over the period, plus $7 billion of short-term cash management bills that matured last Thursday. The latest 3- and 6-month issues were sold at average rates of about 7.62 and 7.43 percent, respectively, compared with 7.68 and 7.51 percent just before the last meeting.

The Treasury also raised about $10 billion in the coupon market, a relatively moderate volume of financing that included only 2 and 5 year notes. Rates had backed up just before these auctions, which closely followed the Desk's highly visible reserve-draining operation on November 27, but the issues were reasonably well bid for at the higher rate levels. More generally, dealers have been willing to take on and hold fairly sizable inventories in the continuing expectation that lower rates are coming eventually--though they grumble about the relatively high cost of carry and do not have unlimited patience while awaiting hoped-for lower financing costs.

In another sector of the capital markets, junk bonds retained a high yield spread over investment grade issues, although the high yield market functioned better after coming to a near standstill a couple of months ago. The junk market remains very much tiered, with some names under great pressure as their imminent

demise is rumored while some other issues are seen as presenting fairly attractive investment opportunities at current high spreads.

Finally, I should mention that we recently added two names to the list of primary dealers--Barclays de Zoete Wedd (a subsidiary of the major UK bank) and UBS Securities (a subsidiary of the Union Bank of Switzerland). The addition of a Swiss-owned firm closely followed the Federal Reserve's determination that the Swiss market in government securities affords equal competitive access to foreign firms. These additions bring the number of primary dealers to 44, including 15 that are more than 50 percent foreign-owned.

E. M. Truman
December 18, 1989

FOMC Presentation -- International Developments

We thought it would be useful to review briefly the implications for the staff's forecast of data received on the external side since the Greenbook was put to bed.

First, we received information on service transactions and the current account deficit in the third quarter. BEA's preliminary estimate was that the deficit was $91 billion dollars at an annual rate -- an improvement of $37 billion from the second quarter. However, all but $5-1/2 billion of the improvement was accounted for by a swing in capital gains and losses associated primarily with the effects of movements in exchange rates. While the improvement in the other current account categories -- income on portfolio investment, military sales, etc. -- in the third quarter was somewhat larger than we expected, revisions for the second quarter went the other way. On balance, this information has not caused us to modify our outlook significantly.

Second, last Friday we received the preliminary estimate of merchandise trade on a Census basis in October and the revised estimate for September. The September deficit was revised up to $8.5 billion from $7.9 billion, while the October deficit was estimated at $10.2 billion. The major revision to the September data was on the export side; however, the October export figure was very close to what we had assumed in the Greenbook forecast, and, as a consequence, we would not be inclined to modify our

outlook for this quarter and early in 1990, which is for moderate growth in export volumes, abstracting from the effects of the Boeing strike which has depressed exports this quarter and should boost them temporarily next quarter.

I should note that three factors have affected our thinking about exports over the past few months: First, we are expecting somewhat stronger growth abroad in the near term, especially in Germany. Second, the dollar has depreciated somewhat faster than we had assumed. Third, operating in the other direction, the underlying performance of our exports over the past several months has been somewhat less robust than we had anticipated earlier.

Imports in October were larger than we expected. Although the strength was reasonably broadly based and may have gone into inventories only to be offset later, available information, including customs processing fees collected in November, suggests that imports are going to be larger this quarter. At this point, we are projecting only a partial reversal of the fourth-quarter surge in the first quarter of 1990.

Summarizing our assessment of the most recent information, we anticipate that in the revision to third-quarter real GNP released tomorrow, the contribution of net exports of goods and services will be larger with the upward revision to services offsetting a downward revision to goods. On the other hand, we would be tempted to revise down our estimate for GNP net exports in the fourth quarter. Even with some bounce back next

quarter, we would be inclined to add about $10 billion at an annual rate to the current account deficits shown in the Greenbook for 1990 and 1991.

Finally, this reassessment does not involve any modification of the projected course of the dollar's foreign exchange value. As I indicated, the dollar has depreciated over the past several months at a faster rate than was implicit in the staff's earlier forecasts and continued to depreciate after the latest forecast was completed. To date we have reacted to these developments by reducing the projected rate of depreciation of the dollar over the balance of the forecast period. Our thinking has been that it is premature to build into the forecast a significant effect from developments in Eastern Europe which have tended to raise the value of the mark and associated EMS currencies, and that nothing else has happened to cause us to change our basic view of the average amount of downward pressure that is likely to be exerted on the dollar over the next two years by our still-large external deficits. At a minimum, the dollar's lower level early in the period tends to bring forward in time the real and price-level effects of the overall depreciation.

Mike Prell will now present the staff's overall outlook.

MICHAEL J. PRELL
DECEMBER 19, 1989

FOMC BRIEFING -- ECONOMIC OUTLOOK

As I'm sure you all sensed from reading the Greenbook, we've become more convinced in the past few weeks that growth in the economy has indeed moved down another notch. Not only have the anecdotal reports remained negative, but the statistical evidence has increasingly fallen into line. Consequently, we now feel more assured in predicting that the pace of expansion will be slow enough in the near term to produce a further easing of pressures on resources and thus some tempering of inflationary forces.

As you'll recall, in November we already had real GNP growth moving below 2 percent in the current quarter and--apart from Boeing effects--remaining there through next year. The only change this month is that we have trimmed our forecast for the current period to less than one percent.

I should note that the available labor market data could be read as suggesting a slight upside risk to this near-term assessment. Private employment growth, at least through November, has been moderate, not weak, and if productivity were to hold up, the hours figures could support a little higher level of overall activity than we've estimated. But, as we looked at all of the information available to us, we perceived a considerable decline in goods output, and this led us to write down a relatively low GNP number.

On the expenditure side of the ledger, there still are major gaps in the data. However, some patterns do seem to be emerging. One is that consumer spending is likely to be weak on average this quarter, after a very hefty surge in the summer. To an extent, this was anticipated: a payback for the summer auto clearance sales was inevitable. But the slump in auto sales has been even greater than we expected, and the resultant cutbacks in assemblies have been deeper.

In addition, spending on other consumer goods also may turn out weaker than we had earlier predicted. I say "may" not only because of the uncertainties about the retail sales data, but also because we don't know yet the outcome of the Christmas shopping season; the reported surge in sales in November conceivably could be a signal that consumers are responding vigorously to the heavy promotions. While news of layoffs at such firms as IBM and AT&T surely doesn't boost consumer confidence, households do still have the income and liquidity to support a substantial amount of spending.

The prospects for orders and production of consumer goods in early 1990 may hinge in no small part on the outcome of the holiday season and its impact on retailer psychology. We expect that what appears to have been a mounting inventory problem in the early fall will be on its way to solution by the beginning of 1990, but with retailers probably having squeezed their profit margins to ensure sales. This suggests some likely caution in ordering merchandise for later in the year, but with many consumer goods being imported, domestic production need not bear the entire burden of that adjustment.

At least that is our assessment for retailing outside the automobile sector. Consumers apparently are suffering a case of sticker shock with respect to the new 1990 cars. But, apart from that, we've come increasingly to the view that several years of heavy sales probably have left households pretty well stocked up, and still paying off a lot of long-maturity loans, so that the underlying demand situation may be a touch weaker than we earlier had thought. Thus, we are anticipating that the first quarter of 1990 will see not only a substantial step-up in incentives but also a low level of production by the Big Three. Together, these steps ought to realign stocks and sales and keep the auto sector from being a significant drag on GNP thereafter.

Another sector that now appears to be weaker than we had anticipated is business fixed investment. The change in the forecast is of moderate dimensions, for it had been our expectation that capital spending would respond significantly to slowing sales growth and deteriorating cash flow. I might say that we find ourselves at this point projecting weaker expenditure increases in 1990 than suggested by the recent McGraw-Hill and ECAP surveys, but given their error histories, the difference isn't significant.

I also should note that, in lowering our forecast of outlays for nonresidential structures, we attempted to take into account the likelihood that the losses now being recorded on commercial real estate will have a sobering effect on lenders. It has often been said that it has been the more-than-ready availability of credit that has kept commercial building going in the face of high vacancy rates, and this circumstance may well be changing.

This thought carries over in some degree to the residential sector, too. October housing starts were stronger than we had expected, especially in the multifamily sector. But we did not raise our forecast, partly because these are noisy data and partly because we've become more persuaded that there are some fundamental changes underlying what has on the whole been a rather flat pattern of starts in the face of lower mortgage rates--a pattern reinforced by the November figures. The combination of demographic trends and already available supply may be a bit more adverse than we had thought earlier, and the slump in prices in some locales seems to be reducing the urgency that people feel to buy now. But, in addition, the reports from builders of reduced availability of construction credit have some plausibility in the context of thrift institution closings and tighter regulation.

Basically, our forecast at this point shows an economy with a variety of what might be characterized broadly as inventory problems. Especially with the October data for business stocks, some of which arrived very late in or after the completion of our Greenbook process, it looks to me like there was something of a developing problem of excessive inventories in a number of sectors. The orders and production data suggest that a correction may already be underway, and we have anticipated weak manufacturing output in the next several months to bring about an adjustment. The completion of bulk of that adjustment is one of the reasons we have projected some pickup in output around the middle of 1990.

In a sense, though, the "inventory" problems extend beyond what shows up in that category in the GNP accounts. I have in mind the

overhangs of unsold housing units and vacant commercial space, and, as I alluded to earlier, the possibly ample stocks of motor vehicles in peoples' garages. It may take some time for underlying demands to catch up with supplies and pave the way for renewed expansion in those sectors.

In this context, the role of the external sector in our forecast becomes all the more significant. Apart from the completion of the auto inventory correction that I noted earlier, the other prominent element in our projection of a modest acceleration of GNP as 1990 progress is the expectation that the depreciation of the dollar will produce a renewed expansion of net exports by the end of the year. As Ted indicated, our projection of a moderate decline in the dollar is in danger of being overtaken by events. But, of course, with the market as volatile as it is, this picture could change radically by next week. For the time being, though, the recent slide of the dollar does provide some reassurance that we were on the right track.

If the dollar's lower level persists, it not only may provide an earlier and stronger impetus to our tradable goods sector, but it may alter the outlook for domestic inflation as well. Owing to the softer near-term output and employment picture, we have edged down our forecast of wage and price increases. Nonetheless, as in prior Greenbooks, we have projected a gradual updrift in the rate of increase in the CPI ex food and energy through 1991 on the basis of a combination of less favorable energy price developments and accelerating non-oil import prices. We've emphasized repeatedly that we make no claim to prescience about the precise timing or magnitude of any dollar depreciation, but if

the overall decline remains of the same magnitude and simply moves forward in time, it would have a corresponding effect on the time path of the U.S. price level.

I'll close with two more, loosely connected observations. First, you may recall that I focused much of my briefing last month on the risks of the projected weakness developing into actual recession. Obviously, while we're still not betting that there will be a period of significantly negative GNP changes, the alterations we've made to our forecast do suggest some modification of the odds.

Interestingly, though, the statistical models that we've reported in the last couple of Greenbooks haven't been pointing to any greater probability of recession, at least through their most recent, October, readings. One of the reasons is the role of financial variables in the indicator series upon which the models are based. (This is especially relevant to the NBER series.) The fact is that monetary, interest rate and stock price indicators don't seem to be flashing recessionary signals. Nor, would I judge, is the median private forecaster, whoever he or she may be; looking at the Blue Chip list or that in the latest Business Week, for example, the central tendency of forecasts is for a somewhat stronger pickup in growth over the coming year than we've projected, evidently owing to the anticipation of a further easing by the Federal Reserve.

Which brings me to my second observation. We have retained our assumption that you will not engage in any substantial further easing, despite the provocation of a rather soggy economy. This reflects a number of considerations, the foremost being that we've kept our focus

on the disinflation objective, and we still believe that this objective will not be attained without some additional slack being created, at least for a time.

D. Kohn
FOMC briefing
Draft 12/19/89

In light of the discussion yesterday, it's tempting to try to place today's decision in a longer-term context. To be sure, by itself, a quarter or a half point on the federal funds rate now won't have much to do with the price level in five years. But, the short and long-runs are not entirely unconnected, and the road to inflation or price stability is paved with small policy adjustments.

From one perspective, the relation of today's decision to the long-term objectives could be seen as straightforward. If the greenbook is about right in its assessment of the outlook, holding the funds rate at its current level under alternative B should be consistent with a policy that continues to restrain demand somewhat in 1990, gradually putting into place conditions for a moderation in inflation. Given this assessment, a tightening of policy, as under alternative C, would make more prompt and certain progress on inflation; an easing of policy, in the direction of alternative A, would be less clearly aimed in the direction of moderating inflation over time.

But, of course the task is not that easy. Today's decision rests not only on a view about ultimate objectives and how they should be approached, but also on an assessment of the risks that the economy's near-term performance would deviate substantially from the desired path. This assessment may be particularly difficult, when, as now, the economy has been coming through a period of transition--in this case from a situation extending into early 1989 in which overheating threatened, to one that seems consistent with market perceptions that inflation would at least remain in its recent range. That transition period would be

extended, of course, were the Committee to pursue a policy over coming years that brought inflation down further. A transition to stable or declining inflation requires economic expansion not only to slow from an unsustainable pace, but to grow less rapidly than potential for a time to relieve pressures on resources. In the real economy, the tilt in growth rates can set off production adjustments and inventory cycles, broadly defined, that Mike discussed, which complicate judgments about the course of the economy.

And those judgments can be further complicated by a parallel transition in financial markets involving asset prices and debt servicing obligations originally assumed in the expectation that price increases would accelerate and nominal income growth remain rapid. The signs of the adjustment to lower inflation and slower income growth have become increasingly abundant over recent months in real estate and junk bond markets, for example, with consequences for those extending credit in those markets. To some extent, strained financial conditions and a tightening of credit standards have been incorporated into the staff forecast, as in the commercial and, to a lesser extent, residential real estate area. The danger is that financial difficulties would become more systemic, influencing lenders and spenders by more than the staff had assumed. This might occur if falling asset prices and difficulties servicing debt caused creditors to tighten standards and raise rates for all borrowers, even those whose credit was unimpaired, and if desires to borrow and spend were substantially affected by concerns about wealth in weak asset markets. If these forces were important, in effect, they would add an element of restraint to monetary policy beyond that suggested by recent relations of activity to interest rates and exchange

rates, perhaps more like the credit availability effects of earlier decades.

To date, credit problems and asset adjustments, while spreading in the transition period, do not appear to be assuming a systemic aspect. Risk premia outside of directly affected markets like junk bonds remain narrow, and stock prices remain elevated, with exceptions for sectors like banks and thrifts feeling the effects of the real estate problems. Even within banking, the spread between rates on short-term liabilities and Treasury issues has been quite narrow, indicating a measured market response to recent bad news. The lack of movement in Treasury yields over the intermeeting period suggests the absence both of a generalized flight to quality and of a significant downward adjustment in market expectations about the course of the economy as financial difficulties come to light.

Elsewhere in financial markets, developments also could be interpreted as supporting something like the greenbook notion of fairly moderate restraint on demand. For example, the drop in the dollar, if it is not reversed, will tend to bolster spending and prices in the latter part of 1990.

And the monetary aggregates have been somewhat stronger than anticipated at the last meeting. In the case of M3, this seems to reflect a decrease in the rate at which the thrift industry is shrinking and a slowing in the activities of RTC. Even so, growth of M3 remains damped, and we expect it to continue at a pace that would leave this aggregate well down in its tentative range for next year. In the staff's judgement, however, slow growth of M3 would indicate more the nature of the restructuring of intermediation flows in the wake of the

thrift crisis than it would restraint on the economy, so long as secondary markets continue to channel funds efficiently into home mortgages.

Strength in M2 appears to be associated with a more rapid response to previous declines in interest rates than had been anticipated, rather than with unexpected strength in contemporaneous spending. In light of the decline in interest rates through the first part of the fourth quarter, M2 is expected to remain robust through the first quarter even under alternative B, running above its tentative range for some time. Whether this growth is cause for concern rests on one level with judgments about the implications for economic activity of the real interest rates associated with the drop in nominal rates that produced the surge in M2. In the staff forecast, such rates eventually have to rise to bring about modest decreases in inflation. The P* model cuts through such complex structural issues. It shows that the surge in M2 brings P* up to the actual level of prices in the first half of 1990, suggesting only a "holding-the-line" on price increases. Under alternative A, P* would exceed the actual price level through much of next year. Given problems interpreting the aggregates and skepticism about drawing inferences from reduced-form models, like P*, one might not want to put too much weight on M2 growth over a few quarters. But continued very rapid monetary growth might be a cautionary signal about the basic thrust of policy. In any event, unless money demands were shifting unexpectedly, M2 growth at rates recently observed and expected into the future would not by themselves seem to be consistent with cumulating and substantial underlying weakness in the economy.

Nonetheless, the Committee could see recent developments in financial markets and the economy as suggesting that the dynamics of

adjustment to a slower inflation path had created the risk of a noticeable shortfall in the economy--beyond one it wished to tolerate to temper inflation. In this case, an easing of policy would seem to be called for. Markets now expect such an easing, and if there were particular concerns about financial feedbacks on the economy, now might be considered a poor time to frustrate such expectations.

At the same time, markets also appear to expect inflation to continue near current levels, and frustrating the expectations of ease might also be seen as an opportunity to affect these long-term price expectations. Any back up in rates under alternative B is likely to be limited, especially in long-term markets, even if current reserve conditions were maintained for a time. Even so, the process of disinflation probably would imply continued adjustments in asset prices and difficulties servicing debt in the transition period. If the Committee were to decide to maintain current reserve conditions, but was concerned about the possibility of appreciable and unacceptable downside risks, it could strengthen the tilt toward ease in the directive. Within the arcane code of the directive, the "woulds" and "mights" have been lined up to point toward ease, but not the "slightlys" and "somewhats", which could be conformed in the same way. More substantively, the Committee could instruct the Desk, and implicitly the Chairman, to be somewhat readier to ease in response to adverse developments in the economy or financial markets than might have been the case over the last intermeeting period.