

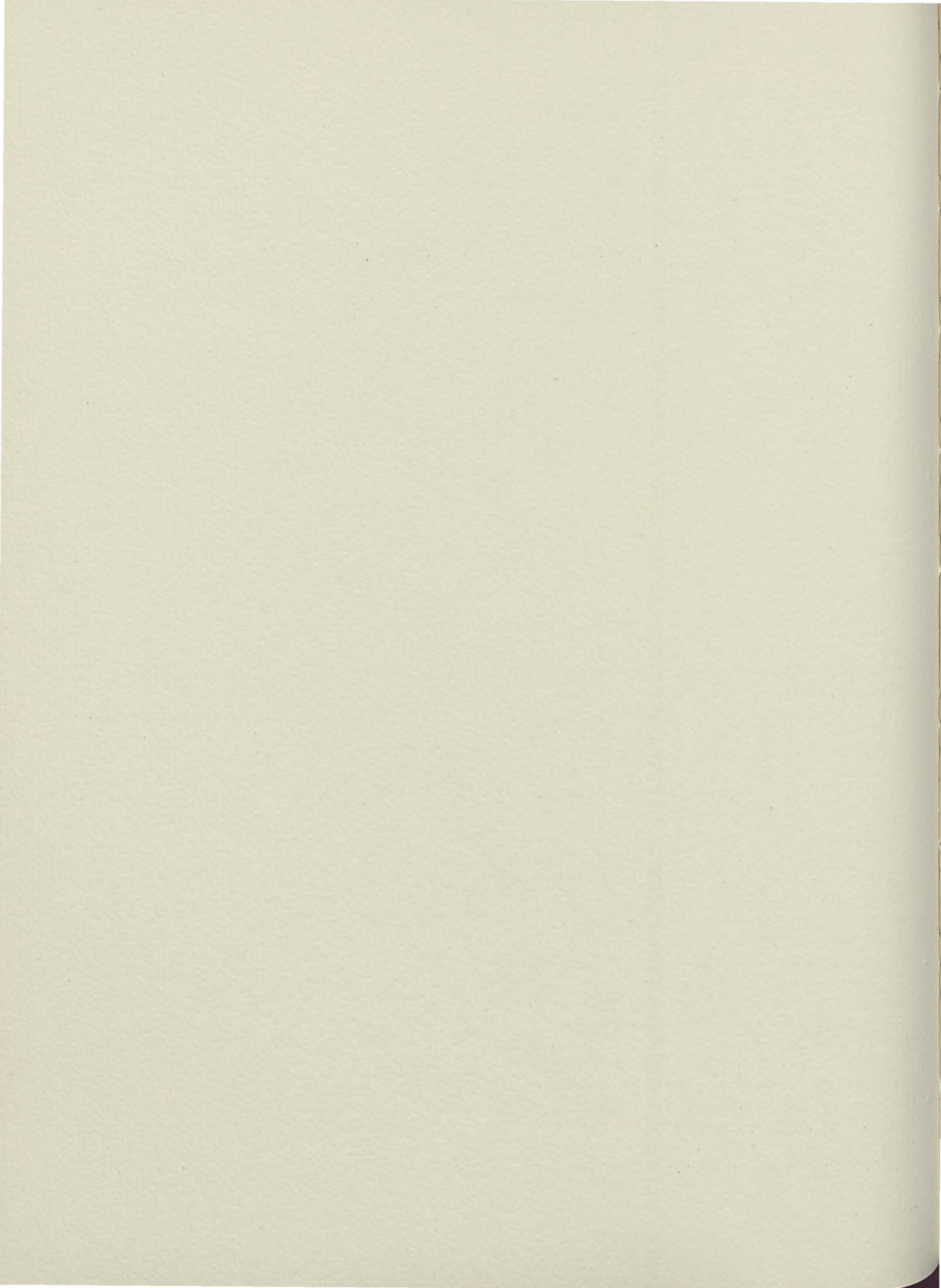
Voice

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Payroll Taxes: A Two-edged Sword?

By Patrick J. Lawler

The social security tax has become an increasingly important source of Federal revenue in recent years. Contributions for social insurance now account for nearly a third of receipts; yet they were less than a fourth of receipts 10 years ago and less than a sixth 20 years ago. The tax has become larger relative to the size of the gross national product as well (Chart 1); consequently, its potential impact on the economy has also grown.

With price inflation accelerating and higher rates of unemployment in prospect in the near future, increasing attention is being paid to a tax that is often accused of aggravating both. Because a payroll tax raises employers' labor costs, it discourages firms from hiring new workers and encourages them to raise prices to pass on the cost increases to consumers. Thus, it is claimed, reducing the social security tax would fight inflation and recession simultaneously. Is it too good to be true?

To analyze this proposition we must first examine how the payroll tax affects wage negotiations, how employers respond to the resulting cost changes, and how employment is affected by the changes in prices and wages. Then we must consider how these short-run effects influence later

wage bargains and monetary policy in order to judge the long-term implications.

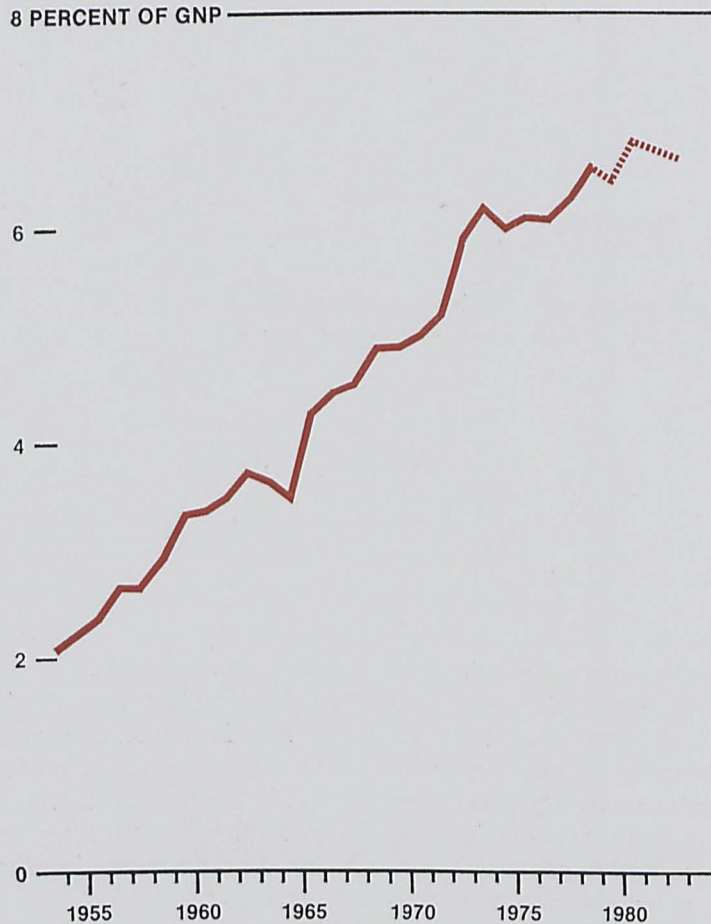
In this article, a large econometric model is used to illustrate and quantify the results. The analysis indicates that if income taxes are substituted for payroll taxes, no long-term improvement in either inflation or unemployment can be expected if the

Because a payroll tax raises employers' labor costs, it discourages firms from hiring new workers and encourages them to raise prices to pass on the cost increases to consumers.

rate of growth of the money stock is unchanged. However, if the tax change is accompanied by monetary restraint, each percentage-point cut in the payroll tax could permanently reduce inflation by about 0.3 percentage point. A complete abandonment of the payroll tax, with social security financed out of general revenues, might therefore

CHART 1

Federal social insurance contributions
have been rising rapidly in relation to GNP



SOURCES: U.S. Department of Commerce.
Federal Reserve Bank of Dallas.

make possible a reduction of 3 to 4 percentage points in inflation without increasing unemployment. A comparison with other related taxes is also included.

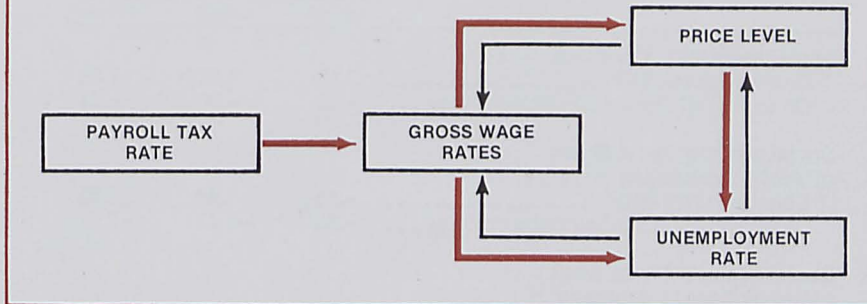
Short-run effects

The accompanying flow chart illustrates the channels of influence of payroll taxes; the colored lines indicate the initial thrust. The first effect of a

payroll tax change is a change in the cost of labor to firms. Just how much labor costs would change is not immediately clear. While a reduction in the social security tax rate would lower employers' tax costs, it might also affect their posture at the bargaining table. With lower taxes on wages, firms could afford to pay higher wages, and in a tight labor market, they might reasonably raise their bids for new workers. In a very competitive labor market it is possible that all the tax reduction

CHART 2

Flow of Effects of Payroll Taxes on the Economy



would be spent on higher money wages, so gross wages—nominal wages plus the employer share of the tax—would remain unchanged. If the market were truly competitive, why would not firms be forced to pay as much as before for labor?

In practice, however, many labor markets are not very competitive, and in most others adjustments in money wages occur slowly because of written or implicit contracts. The benefits of tax reduction might be shifted to labor only after a lag or not at all.

The Appendix to this article presents a brief discussion of earlier estimates of the direct influence of payroll taxes on wages, as well as some new results. Estimates of the initial incidence of tax changes are generally consistent with the hypothesis that neither firms nor workers can shift their shares of a tax change immediately. However, estimates of the lagged effects on wages differ considerably. Some estimates indicate that future wage increases are less (more) than they would otherwise have been, given the rates of price inflation and unemployment, after a tax increase (decrease), and other tests show just the opposite. But none of these results were statistically reliable, so the pattern of direct effects on wages remains uncertain and the assumption that employers would not pass their gains from tax reduction back to employees may be realistic.

If payroll taxes do affect gross wages, then there is substantial scope for them to affect prices and unemployment. Since prices are less sticky than wage rates, firms in competitive markets may be

induced to reduce the size of their price increases rather than augment wage increases. For at least a short while, then, a payroll tax cut should reduce inflation.

Even if not as sticky as wages, prices in many industries adjust slowly. Firms in these industries, with wage costs lower and prices only slightly reduced, should find it profitable to expand by hiring more workers. Thus, in the short run, unemployment should also decline.

The simulation results are most impressive in the case in which the payroll tax cuts are offset by income tax increases. After 18 quarters and five annual rollbacks of planned social security tax increases, production is 2 percent higher and prices are 2 percent lower.

This completes the pattern of effects shown by the colored lines on the flow chart. In the short run, then, a payroll tax cut may reduce both inflation and unemployment. We have ignored, however, the problem that a tax cut must be financed in some unpleasant manner. Either Government borrowing or taxes must rise, or Government spending must fall. Any of these choices would tend to increase unemployment.

**SHORT-RUN EFFECTS
OF A SOCIAL SECURITY TAX
ROLLBACK UNDER DIFFERENT
FINANCING ALTERNATIVES**

	Differences from values implied by an unchanged tax policy (Percent)		
	1981-Q2	1982-Q4	1984-Q2
Social security tax rollback			
Change in real GNP	0.59	1.62	1.54
Change in GNP implicit price deflator ...	-.53	-.89	-.51
Social security tax rollback offset by income tax increase			
Change in real GNP	-.15	.49	1.95
Change in GNP implicit price deflator ...	-.53	-1.43	-2.01
Social security tax rollback offset by benefit decrease			
Change in real GNP .....	.36	.46	.50
Change in GNP implicit price deflator ...	-.53	-1.03	-1.78

To take these factors into account and to quantify in a rough manner the overall effects, a large econometric model of the U.S. economy—the MIT-PENN-SSRC (MPS) model—was used. Econometric models are, of course, based on past relationships that may change over time and even be affected by the policy changes they are used to investigate. Nevertheless, they may well provide a good qualitative comparison of policy options as well as some indication of their quantitative effects. The wage equation in the model was adapted so that changes in payroll taxes have no effects on nominal wages but do alter employers' labor costs by the full amount of the employer portion of the tax change.¹ Four different policy options were considered.

In three of them, the social security tax rate increases scheduled for 1981 and 1982 were rolled back, as well as the tax base increases in each year from 1980 through 1984. Since a social security

tax rollback has been increasingly discussed as an alternative to income tax cuts, this is an interesting policy alternative to investigate. One option includes only the rollbacks. Since this option implies changes in stabilization policy that may not be relevant here, the other two options provide means of financing the rollbacks without increased Treasury borrowing. In one of these, the rollbacks are offset by an increase in income taxes, split three-fourths to individuals and one-fourth to corporations. The increases were made just large enough to keep the budget deficit unchanged. This option compares, in effect, the differential impact of social security and income tax cuts. In another option the rollbacks are financed by an offsetting decrease in social security benefits. The final option does not include any tax or benefit changes. Growth in the money supply is identical in all simulations.

The results appear in the accompanying table. In each case, the simulation results are compared with the results from the corresponding model version in which no tax changes occur. In each simulation, output increases and prices decrease after the rollbacks. The results are most impressive in the case in which the payroll tax cuts are offset by income tax increases. After 18 quarters and five annual rollbacks of planned social security tax increases, production is 2 percent higher and prices are 2 percent lower.

In general, these results suggest somewhat more potential benefit from tax rollbacks than is found

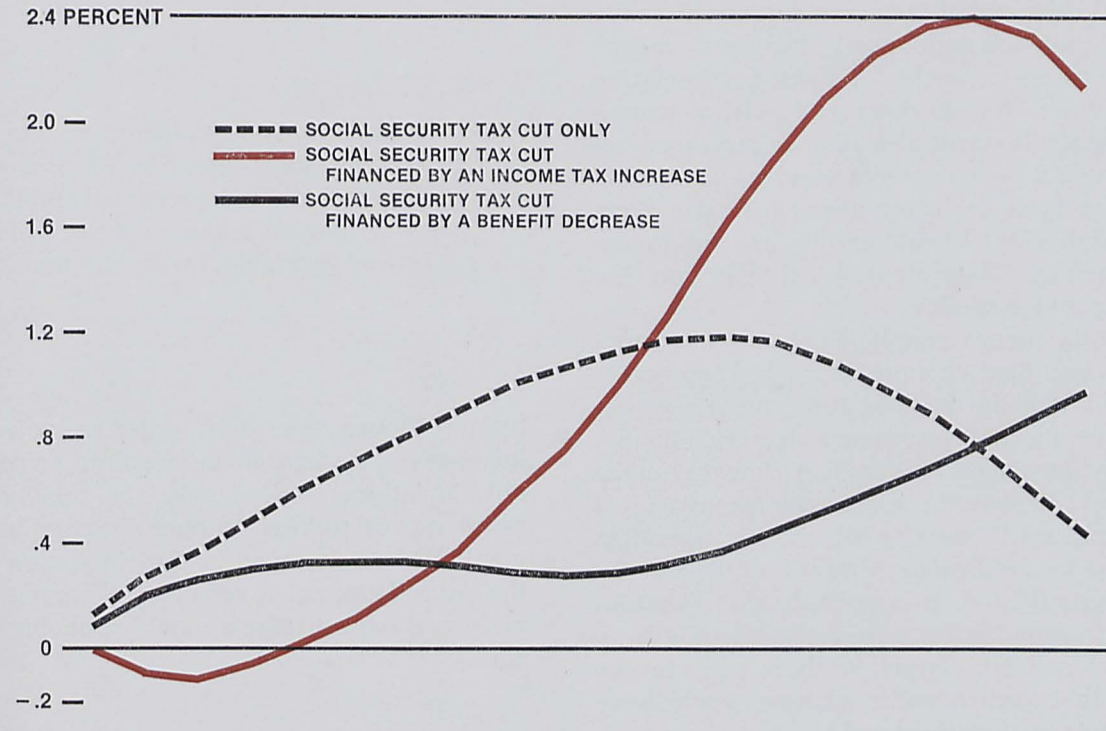
1. Since the payroll tax change variable in the MPS wage equation is difficult to interpret, it was replaced by one like Δt in the Appendix. It was defined as the change in old-age and survivors insurance (OASI) contributions per hour worked in nonfarm business divided by total hourly compensation lagged one period. The simulation results were similar to those using the unadulterated model when b_a , as defined in the Appendix, was set equal to .5.

CHART 3

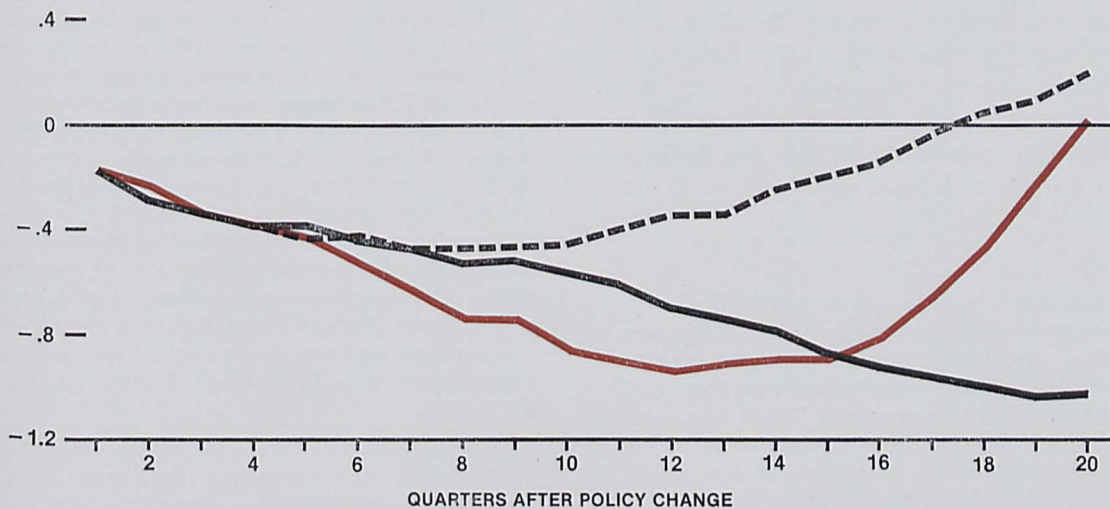
Longer-Term Effects of a One-Time Social Security Tax Reduction, Assuming No Direct Tax Shifting and a Fixed Money Growth Path

(Variables expressed as differences from values implied by an unchanged tax policy)

GROSS NATIONAL PRODUCT (1972 DOLLARS)



GNP IMPLICIT PRICE DEFLATOR



in other studies using large models.² However, all have shown significant improvement in inflation without increased unemployment.

Long-run effects

There is no reason to assume that the long-run effects will all be as beneficial. The paths of influence indicate that the black lines on the flow chart must eventually become important. A decrease in inflation should reduce wage demands (and offers) below what they would otherwise have been. Reduced unemployment, however, means that labor markets would be tighter, stimulating the competition for workers and raising wages. Reduced unemployment also implies increased aggregate demand for goods and services—lessening pressure for firms to lower prices (or raise them more slowly). The ultimate results are not immediately obvious. They depend critically on the course of monetary policy.

Suppose the money supply is controlled without regard to any tax changes. Classical monetary theory holds that in the long run, unless the productive capacity of the economy changes, changes in the price level can only reflect changes in the money stock. If lowered prices were accompanied by an unchanged quantity of money, spending would increase, and prices would be bid back up to their original level. It is unlikely that substitution of an income tax for a payroll tax would have much effect on labor supply, so there is no reason to expect that such a policy change would have lasting effects on the price level.³

This independence of the price level and the payroll tax rate contrasts with the MPS model results in the previous section, although the assumptions—labor and money supplies fixed—are the same.⁴ Why the difference? The MPS simulations above included a series of annual tax reductions continuing almost to the end of the simulation period, which leaves inadequate time for the economy to fully adjust to all the changes.

To get a better look at the longer-run response, the model was used to simulate the economy for 20 quarters after a single permanent decrease in the tax rate that was equal in size to the planned 1981 increase. The results for the three financing alternatives are presented in Chart 3. The price effects are all definitely weaker than in the first simulations, although the price level remains somewhat affected by the tax changes. However, in the simulations in which the rollbacks are financed

The fixed money supply assumption implies that all the short-term benefits of payroll tax reduction will be reversed and that slower inflation in the short run will be followed by higher, faster inflation later.

by new Government debt issues or by income tax increases, the sums of the absolute price and output deviations decline over the final year. Five years are still not long enough for complete adjustment. Ultimately, even in the simulation in which the payroll tax cut is offset by a benefit decrease, price and output effects would probably return to zero.

3. A formal, mathematical analysis is available from the author on request. The assumption of a fixed labor supply is somewhat questionable. Several studies have estimated positive income-compensated wage elasticities of labor supply, especially for marginal workers. See, for example, Marvin Kosters, "Effects of an Income Tax on Labor Supply," in *The Taxation of Income from Capital*, ed. Arnold C. Harberger and Martin J. Bailey (Washington, D.C.: Brookings Institution, 1969), pp. 301-24; Sherwin Rosen and Finis Welch, "Labor Supply and Income Redistribution," *Review of Economics and Statistics* 53 (August 1971): 278-82; and Jane H. Leuthold, "The Effect of Taxation on the Hours Worked by Married Women," *Industrial and Labor Relations Review* 31 (July 1978): 520-26. Although the net wage elasticity of the total work force is likely to be smaller, its potential effects may be important since most workers now earn less than the maximum wage base and do, therefore, face a tax at the margin.

4. Actually, the MPS simulation assumes that the rates of change of the labor and money supplies are fixed. The distinction is unimportant as long as the MPS model is capable of reaching a steady state.

2. See U.S. Congress, Congressional Budget Office, *Aggregate Economic Effects of Changes in Social Security Taxes*, by Helmut Wendel and Fiscal Analysis Division staff, Technical Analysis Paper (1978), and John Hagens and John Hambor, "The Macroeconomic Effects of a Payroll Tax Rollback," ORS Working Papers Series, no. 11 (Washington, D.C.: Social Security Administration, Office of Policy, Office of Research and Statistics, Division of Economic Research, 1979).

After the tax cut reduces costs initially, firms pass on these savings to consumers in the form of lower prices. Maintaining the same money supply when prices are lower is more expansionary, so output increases. But the increase in production lowers the unemployment rate, which eventually increases the rate of wage inflation. This increases costs to firms; inflation stops decreasing and starts increasing. Eventually the money supply determines the level of nominal GNP, and in the MPS model, equilibrium real GNP is determined by essentially fixed factor supplies, so the price level must also return to its starting point.

The fixed money supply assumption implies, then, that all the short-term benefits of payroll tax reduction will be reversed and that slower inflation

in the short run will be followed by higher, faster inflation later. If the future is discounted at high rates, there may be a place for such a policy. In the income-tax-financed rollback, inflation remains lower than it would otherwise have been for three years. But such a policy cannot be considered, by itself, a long-run anti-inflationary plan.

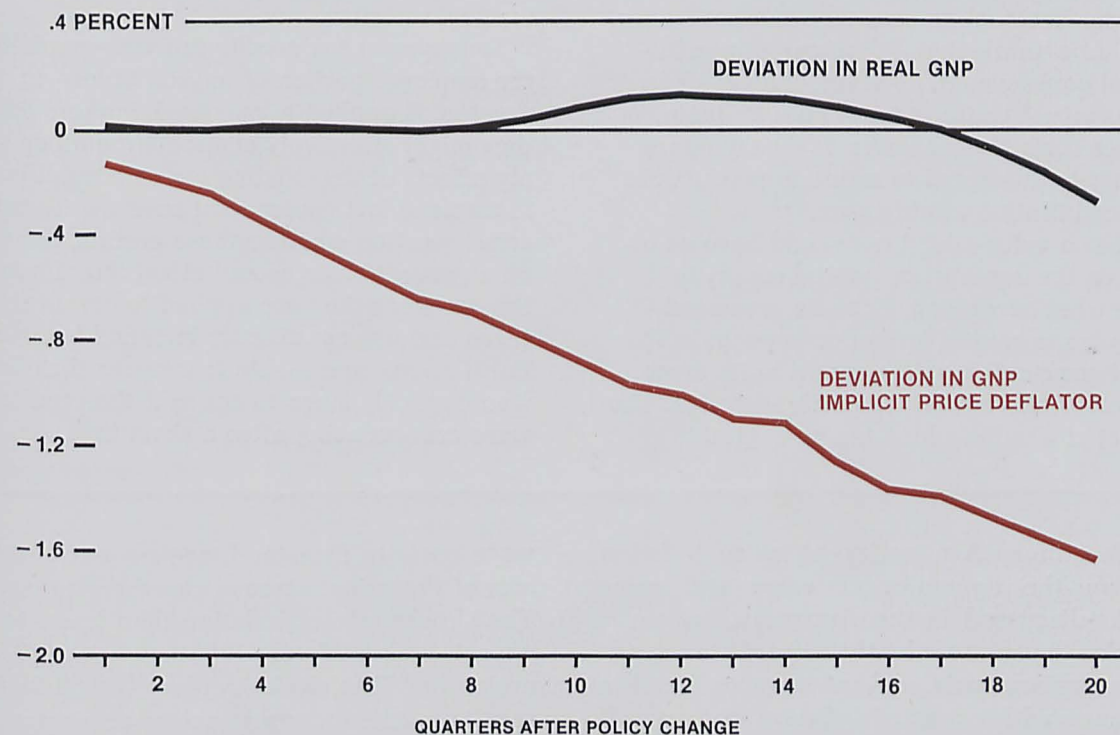
A responsive monetary policy

It is probably unrealistic as well as unreasonable to suppose that monetary policy would be unaffected by the short-run economic changes caused by a payroll tax reduction. Imagine instead that the money supply is manipulated to maintain a particular path of real output.

CHART 4

Longer-Term Effects of a Social Security Tax Reduction Financed by an Income Tax Increase, Assuming a Variable Money Growth Path

(Variables expressed as differences from values implied by an unchanged tax policy)



Value-Added Taxes, Expenditure Taxes, Employment Tax Credits

Payroll taxes bear interesting relationships to some other currently discussed fiscal measures. A *value-added tax* would have much the same effect as the employer portion of the payroll tax. In the form usually discussed, a value-added tax would be analytically indistinguishable from a tax on wages collected from employers, since capital purchases would be deductible.

If a value-added tax were substituted for the payroll tax as a means of financing social security, the effect would be much the same as if the employee portion of the payroll tax were eliminated and the employer portion doubled. Based on the analysis in the accompanying article, such a shift would be highly inflationary initially; and if monetary policy is geared to maintaining production at particular levels, the shift would lead to a permanent increase in inflation. No long-run effects on the labor supply, output, or the capital-output ratio are likely since the difference between gross wages and net wages would be unaffected. In the current insitutional environment, however, the switch in taxes would cause firms to pass on their higher costs to consumers. If the monetary authority attempted to maintain production, higher inflation would ensue.

That a value-added tax would have no effect on the equilibrium capital supply is somewhat surprising, since its presumed stimulus to capital formation is perhaps the most commonly used argument in its favor. However, the mystery is easily dispelled. The effect of a value-added tax on capital

depends on the tax it replaces. Substituting a tax on wages for a tax on wages should not be expected to have much effect. But if a value-added tax were substituted for a portion of the income tax, different results would be expected. We would then be replacing a tax on both labor and capital with one on wages alone.

An *expenditure tax* on individuals, however, is a very different thing. If the tax were levied annually on a progressive basis, it is difficult to see how it would be treated any differently, with respect to wage demands, from an income tax. If the expenditure tax were substituted for a payroll tax, firms' costs would be reduced, so inflation would decrease in the short run with a fixed money supply path or in the long run with a flexible monetary policy. On the other hand, it would differ from an income tax in that capital income would be exempt, so investment would not be affected. In short, an expenditure tax is analytically comparable to the employee portion of the payroll tax, while a value-added tax is comparable to the employer portion.

Employment tax credits are very much like the employer portion of payroll taxes—in reverse. If applied to marginal workers only, they might effectively eliminate the labor supply effects of the existing tax at a small cost in terms of lost government revenue. There is some question whether these credits, if used on a general basis, would offset the effects of the tax since they are applied to corporate taxes and are not directly included in costs. But it seems reasonable to suppose that firms would quickly learn to act as if the credits were cost-reducing after a short time.

The effect of such a policy on price inflation depends on the dynamics of wage and price change. As discussed in the Appendix, increases in the price level are closely related to recent rises in production costs, and gross wages increase in accordance with expected inflation and payroll tax changes. A payroll tax reduction lowers gross

wage costs to firms and, consequently, lowers the size of the price increase necessary to cover costs. The slower rate of inflation then leads to reduced expectations of future inflation, so wage increases are curbed. The slower rate of wage inflation again results in a reduction in prices necessary to cover costs, and so on. Since prices are going up less

rapidly, the growth rate of the money stock consistent with full employment is lower. The implication is that a payroll tax cut appears to provide an opportunity to reduce money growth and permanently lower inflation without causing extra unemployment.

The simulation shown in Chart 4 gives an indication of the magnitudes involved. Starting in the first quarter, the total payroll tax is reduced by 1.04 percentage points (the amount of the planned 1981 increase) in each quarter. The reduction amounts to \$11.5 billion initially and grows to \$19.4 billion after 20 quarters but remains roughly constant in terms of GNP. The budget deficit was again kept to its original path by increasing personal and corporate income taxes, and the growth

The implication is that a payroll tax cut appears to provide an opportunity to reduce money growth and permanently lower inflation without causing extra unemployment.

rate of the money stock was adjusted in an attempt to keep real GNP on its original path. The results indicate a permanent decrease in inflation of about 0.3 percent annually.

Summary and conclusion

This article has examined the price and output ef-

fects of the payroll tax for social security. Analysis shows that in the short run, a reduction of the tax would decrease employers' labor costs and that firms would be more likely to pass these gains to consumers than back to workers. The decrease in labor costs should also induce hiring of more workers, reducing unemployment.

Further analysis indicates, however, that in the long run, these benefits would disappear unless the Federal Reserve were to slow the rate of money growth. Otherwise, the period of slowed inflation would be followed by a period of increased inflation, and ultimately, prices would be unaffected by the tax reduction. The effects on unemployment would be short-lived in either case.

These conclusions are supported by simulations of the economy with the MPS model. If planned social security tax increases over the next five years were repealed, the model indicated that average annual inflation over the period would be as much as 0.4 percent less than it would otherwise be while average annual economic growth would be as much as 0.4 percent greater—even without any changes in monetary policy.

In simulations tracing the effects of a single tax reduction over a longer period, however, reductions in money growth were essential to any long-term inflation improvements. But a substitution of income taxes for payroll taxes would provide an opportunity to lower inflation by perhaps as much as 0.3 percentage point for each percentage-point reduction in payroll taxes without increasing unemployment.

Appendix

Measuring the Direct Effects of Payroll Tax Changes on Price and Wage Decisions

Estimates of short-run payroll tax shifting are usually based on two econometric equations: one for prices and one for wages. Most econometric price equations assume that prices are determined as a lagged adjustment markup over wage costs. Thus, for example, the main price equation in the MPS model is

(approximately and ignoring irrelevant terms):

$$\ln \left(\frac{P}{W} \right) = \text{constant} + .7 \ln \left(\frac{P_{-1}}{W} \right),$$

where P is the price level and W the wage level including employee benefits and employer payroll taxes, or equivalently:

$$\ln P = \text{constant} + .7 \ln P_{-1} + .3 \ln W.$$

The structure of the equation requires that, at the margin, an increase in wages or employer payroll taxes eventually leads to a fully proportionate increase in prices, regardless of the estimated parameters. But

initially, given these parameters, only 30 percent of the increase is passed on. Other commonly used price equations are similar.¹

Estimated wage equations offer a wider range of possibilities for tax shifting. The results considered here are based on estimates of equations of this general form:

$$\% \Delta W = \text{constant} + b_1(\% \Delta P)^e + b_2 \frac{1}{LU} + b_3 \Delta t,$$

where e is an expectation, LU is the unemployment rate, and t is the average effective social security tax rate including both firms' and workers' portions. The coefficient b_3 measures the extent to which tax changes directly affect wages. An estimated value of .5 would indicate that no shifting of tax between firms and workers takes place; a value of zero would imply that the whole tax is shifted immediately to workers, so firms have no added expense to pass on to consumers; and a value of 1 would indicate that firms pay the workers' shares as well as their own, which would lead to the maximum effect on inflation.

The inclusion of lagged tax changes may be necessary since institutional constraints probably prohibit much shifting within the quarter in which taxes are changed. A change in the payroll tax rate might reasonably be expected to cause wage changes of one-half the amount of the tax change in the current quarter. Shifting in later periods could occur in any of three ways. One possibility is that tax changes could affect future wage negotiations directly, so that with given rates of expected inflation and unemployment, the size of the wage increase might depend on recent changes in payroll taxes. For example, if employers were able to shift their tax backward in this manner, we would expect a coefficient of about .5 for current tax changes and coefficients on lagged changes adding to $-.5$, so the effects on total compensation would be canceled.

Tax changes could also be shifted indirectly by affecting either of the other two arguments in the wage equation. If expected inflation

were to increase because of the tax (caused by employers passing their costs forward to consumers) and if b_1 , the estimated responsiveness of wages to inflation, is less than unity, then workers would not be fully compensated for the price increases and their real wages would decline. This type of shifting would not involve any direct response to past tax changes in wage negotiations, so the expected coefficient estimates of lagged tax changes would be zero.

The third possibility is that employers could pass on their cost increases to consumers, and if economic policy measures were taken to limit the effects on prices, unemployment would increase. Future wage increases would be reduced, and real wages would decline. Again, the expected coefficients of past tax changes would be zero.

Empirical estimates of the wage equation test for only the first type of shifting. The results of past investigations are quite varied.² Perry, using changes over the past four quarters, estimated b_3 at .70. Gordon included the two shares of the tax separately with no lags, getting results equivalent to .31. He reports that experiments with lags were not successful. Vroman, using different measures of wage change and unemployment, obtained results of .26, .24, .53, and .52. He also tried equations with five quarters of lagged changes in social security taxes. The initial effect was the same, but when the lagged effects were added in, the total effect was alternatively measured as .39, $-.14$, .82, and .52. No firm conclusions there. Finally, Hagens and Hambor, using annual data and lags going back two years, obtained ultimate results of .37 and .11, depending on their measure of social security taxes.

2. Such studies include: George L. Perry, "Changing Labor Markets and Inflation," *Brookings Papers on Economic Activity*, 1970, no. 3, pp. 411-41; Gordon, "Inflation in Recession and Recovery"; Wayne Vroman, "Employer Payroll Taxes and Money Wage Behaviour," *Applied Economics* 6 (September 1974): 189-204; and John Hagens and John Hambor, "The Macroeconomic Effects of a Payroll Tax Rollback," ORS Working Papers Series, no. 11 (Washington, D.C.: Social Security Administration, Office of Policy, Office of Research and Statistics, Division of Economic Research, 1979).

1. See, for example, Robert J. Gordon, "Inflation in Recession and Recovery," *Brookings Papers on Economic Activity*, 1971, no. 1, pp. 105-58.

THE DIRECT EFFECTS OF PAYROLL TAX CHANGES ON WAGE INFLATION

(Dependent variable = 4 × percent change in compensation per man-hour in nonfarm business)

Variable or statistic	Estimated wage equations					
	1 (MPS)	2	3	4	5	6
Inverse of unemployment rate	13.28 (3.8)	8.27 (2.5)	6.22 (1.7)	7.98 (1.8)	8.97 (2.9)	6.94 (1.9)
Change in unemployment rate	-1.33 (-3.2)	.08 (.2)	-.03 (-.1)	-.30 (-.6)	-.34 (-.6)	-.09 (-.2)
Expected percent change in prices . . .	.95 (10.0)	.87 (11.0)	.82 (9.1)	.95 (5.8)	1.00 —	.85 (5.5)
Percent change in minimum wage . . .	.013 (2.0)	.013 (2.1)	.015 (2.1)	.010 (1.5)	.010 (1.5)	.010 (1.5)
Price control dummy	-2.78 (-2.6)	-3.03 (-3.3)	-3.17 (-3.2)	-3.02 (-3.1)	-3.03 (-3.1)	-2.67 (-2.8)
Current change in social security tax rate	n.a.	.54 (5.0)	.63 (4.9)	.58 (4.8)	.57 (4.9)	
Change in social security tax rate Lagged one quarter . . . . .			.11 (.9)			
Lagged two quarters . . . . .			.09 (.7)			
Lagged three quarters . . . . .			.12 (.9)			
Lagged four quarters			-.09 (-.6)			
Sum of coefficients of 12 distributed lag changes in social security tax rate ²				-.75 (-8)	-1.02 (-1.9)	
Current change in total payroll tax rate . . . . .						.61 (5.3)
Sum of coefficients of 12 distributed lag changes in total payroll tax rate ²						-.22 (-.2)
Sum of payroll tax coefficients . . . . .		.54	.86	-.17	-.45	.39
\bar{R}^2 . . . . .	.61	.72	.70	.71	.46	.72
Rho	-.015	.045	.013	-.024	-.021	-.020
Durbin-Watson	2.00	1.99	1.99	1.96	1.96	1.97
Sample period	1953-Q4 through 1975-Q3	1958-Q2 through 1979-Q2	1959-Q2 through 1979-Q2	1961-Q2 through 1979-Q2	1961-Q2 through 1979-Q2	1961-Q2 through 1979-Q2

1. Constrained.

2. No endpoint restrictions; second-degree polynomial.

n.a.—Not applicable; variable used for social security taxes is not comparable.

NOTE: Figures in parentheses are *t* statistics of the regression coefficients.

The general tenor of these results is that probably a small part of the employer portion is shifted backward with a lag. But the range of estimates runs from complete backward shifting by employers to labor shifting most of its share forward.

The diversity of results leaves the issue quite unsettled. Since this article is particularly concerned with the effect of tax changes in the broad context of a large macro model, an attempt was made to adapt the MPS wage equation to the issue at hand. The MPS equation has no term equivalent to Δt ; it uses the change in the maximum payment rather than the change in the average effective payment. The maximum payment is not a good choice if the proportion of people that pay it changes over time. Accordingly, the equation was reestimated in a variety of ways, with two different measures of Δt and with a few different lag specifications. Most of these equations use OASI contributions divided by nonfarm wages as the tax rate, while some include unemployment taxes as well.

The results are presented in the table. Five variants of the wage equation are shown along with the non-payroll-tax coefficients from the MPS equation for comparison. Although a few other similar equations were estimated, these are fully representative.

Equation 2, with no lagged values, shows virtually no shifting in either direction, as expected. Lagged changes in taxes were introduced in the other equations but with little success. Adding four lagged quarterly changes in equation 3 increased the effects of taxes on total compensation, implying that workers could shift most of their tax to employers. However, for equation 4, in which three years of lags were included, the results

imply, implausibly, that firms shift more than 100 percent of their portion of the tax back to workers. In equation 5 the coefficient on expected price change was constrained to unity on the basis that it is real wages, rather than money wages, that concern market participants. These results were even more implausible. Finally, equation 6 used a measure of tax change that includes changes in unemployment insurance rates. Even though such changes have been relatively minor, their inclusion substantially altered the lag coefficient estimates from those in equation 4.

This diversity of results was accompanied with high standard errors for the coefficients of the lagged tax changes. Not one of those coefficients was significant in any regression equation. The coefficient of current tax change, however, was always significant and always between .49 and .64. It seems reasonable to conclude that the initial incidence is institutionally constrained to be about equal to the ostensible division of tax payments. But whether money wage changes in future quarters are affected directly is very much an open question.³ Certainly these results provide no evidence that tax changes affect wage negotiations with given inflation expectations and unemployment.

3. In *Aggregate Economic Effects of Changes in Social Security Taxes*, a Technical Analysis Paper of the U.S. Congress, Congressional Budget Office (1978), Helmut Wendel and Fiscal Analysis Division staff offer a likely explanation for the poor results most researchers have obtained. Variation in the social security tax change variable is dominated by large increases in a small number of quarters. When long lags are used, those large changes are included somewhere in almost every observation.

“Fed Quotes”

Brief Excerpts from Recent Federal Reserve Speeches, Statements, Publications, Etc.

“The Congress may wish, of course, to consider special programs to aid housing through this current difficult period. In any such consideration, we would urge that the benefits expected from specific measures be carefully weighed against the likely costs. The types of programs used in the last housing downswing to provide mortgage credit to homebuyers at below-market interest rates undoubtedly would provide some support for housing activity in the short run. On the other hand, Federal borrowing to finance these programs would tend to put further upward pressure on market interest rates and could thereby intensify the problems being experienced by the thrift institutions. Use of special subsidy programs, moreover, would add to budgetary and/or Federal credit program outlays and would logically call for offsetting cutbacks in other areas if the discipline of holding back on Federal expenditures as a part of the inflation fight is to be maintained.

“In any event, short-run solutions designed to aid the mortgage and housing markets will not go to the core of the problem facing these and other sectors of the economy. In order to obtain lasting improvement, the inflationary process must be halted. As inflation abates and inflationary expectations dissipate, market interest rates will recede and pressures on the depository institutions will ease. The Federal Reserve role in assisting this process must be to restrain growth in money and credit to rates consistent with the longer-run needs of the economy. Our success in holding to this course, I believe, will constitute the best hope for restoration of stable, viable housing and residential mortgage markets that will serve the growing needs of our population.”

J. Charles Partee, Member, Board of Governors of the Federal Reserve System (Before the Joint Economic Committee of the U.S. Congress, April 16, 1980)

“The process of breaking the inflationary grip on our economy will not be a painless one. But only by obtaining some degree of price stability can we create an environment in which small business can prosper. Once the inflationary spiral is broken we may expect to see interest rates move down, with particular benefit to small businesses. Indeed, the procedures adopted by the Fed in October promise a more prompt decline in rates, once demands for money and credit ease, than in the past. Without a reduction in inflationary expectations, however, we have no hope of lowering interest rates over the longer term. Such a reduction can only occur when businessmen and consumers become convinced that all branches of government have truly recognized inflation as our ‘number one problem’ and have taken the necessary—often painful—steps to deal with it.”

Frederick H. Schultz, Vice Chairman, Board of Governors of the Federal Reserve System (Before the Subcommittee on Access to Equity Capital and Business Opportunities, U.S. House of Representatives, April 2, 1980)

"I would personally encourage the Congress to work with the Administration to implement even deeper cuts in spending than are currently in prospect. But what is essential is that there be a clear commitment to the consistent application of budgetary discipline in the years to come, and a reduced rate of expenditure increase should be the centerpiece of that discipline. Such a policy, complementing consistent control of the money supply, would provide a credible basis for anticipating sustained progress against inflation.

"That we are faced again with an imminent need to raise the debt ceiling is a sobering reminder of how difficult it has been in practice to achieve a reasonable balance between federal outlays and receipts. It would be unreasonable and unwise to insist that the government budget be in balance or surplus every year in all economic circumstances. But deviations should be the exception; it would be naive to ignore the obvious bias toward deficit that has been apparent in the conduct of fiscal policy. The record speaks for itself: the federal budget has been in deficit in every one of the past 10 years, and has been in surplus only once during the past 20 years. Most recently, the Federal Government has continued to run huge deficits even in the late stages of one of the longest expansions in the postwar era.

"In retrospect, it is apparent that there has been a tendency in the development of fiscal policy to focus more on the possibility of weakness in economic activity than on the danger of greater inflation. In my judgment, the resulting pattern of budgetary decisions has played a major role in both accommodating and intensifying inflationary pressures. It also should serve as a warning in the present circumstances. The current resolve to cut expenditures and balance the budget in the next fiscal year is to be applauded. But history strongly suggests that it will be difficult to sustain budgetary discipline. This lesson must be kept firmly in mind if the sacrifices made in the short run are to produce lasting benefits.

"The financial counterpart of persistent budget deficits has been, of course, a mushrooming of the federal debt. The federal debt subject to statutory limits reached \$845 billion at the end of February, almost three times its level in 1960. This enormous expansion of debt has serious consequences for economic performance. Federal borrowing absorbs scarce private savings and intensifies pressures in financial markets. When productive resources are being pressed by strong demands for goods and services and overall credit supplies are tight, the government preempts the loanable funds that would otherwise be available to finance private capital formation."

Paul A. Volcker, Chairman, Board of Governors of the
Federal Reserve System (Before the Subcommittee
on Taxation and Debt Management, U.S. Senate,
April 2, 1980)

"While the inflation lasts, the Federal Reserve should be focusing on the one objective of bringing it down. Unemployment should be dealt with by other means than overheating the economy. There are many constructive ways of doing that, from job training to hard-core hiring subsidies to improvements in literacy, and, where necessary, improvements in unemployment compensation for those who demonstrably cannot find work. So long as we have not even exempted teenagers from the minimum wage requirements, we can hardly say that we have made a thorough effort to deal with unemployment by micro policies.

"The Federal Reserve would not cease to be making a contribution to removing unemployment. But it would be doing so by reducing inflation, which is one of the causes of lasting unemployment, rather than by the short-lived device of monetary expansion."

Henry C. Wallich, Member, Board of Governors of the Federal Reserve System (At a meeting sponsored by the Federal Reserve Bank of San Francisco and the American Bankers Association, San Francisco, California, March 7, 1980)

New member banks

Lincoln Centre Bank, N.A., Dallas, Texas, a newly organized institution located in the territory served by the Head Office of the Federal Reserve Bank of Dallas, opened for business April 3, 1980, as a member of the Federal Reserve System. The new member bank opened with capital of \$1,500,000 and surplus of \$1,500,000. The officers are: Ray J. Pulley, Chairman of the Board; Jim Baber, President and Chief Executive Officer; Jim Griggs, Senior Vice President and Cashier; and Beth Stevens, Assistant Vice President.

Liberty National Bank, Dallas, Texas, a newly organized institution located in the territory served by the Head Office of the Federal Reserve Bank of Dallas, opened for business April 7, 1980, as a member of the Federal Reserve System. The new member bank opened with capital of \$1,500,000 and surplus of \$1,500,000. The officers are: C. A. Richardson, Chairman of the Board; Bill R. Prince, President; Robert E. Edgmon, Executive Vice President; Carole J. Jenkins, Vice President and Cashier; and Frances H. Poplin, Administrative Assistant to the President.

New nonmember banks

Farmers Branch Bank, Farmers Branch, Texas, a newly organized insured nonmember bank located in the territory served by the Head Office of the Federal Reserve Bank of Dallas, opened for business April 1, 1980.

Peoples State Bank, Dallas, Texas, a newly organized insured nonmember bank located in the territory served by the Head Office of the Federal Reserve Bank of Dallas, opened for business April 10, 1980.

Regulatory Briefs and Announcements

Managed Liabilities: Reserve Requirement Increased, Base Reduced

On October 6, 1979, the Board of Governors of the Federal Reserve System amended Regulation D to establish a marginal reserve requirement of 8 percent on the amount by which the total of certain managed liabilities of member banks (and Edge Act and Agreement corporations) and U.S. branches and agencies of foreign banks exceeds the amount of an institution's base of managed liabilities. An institution's base was defined as the daily average amount of total managed liabilities outstanding during the period September 13-26, 1979, or \$100 million, whichever is greater.

On March 14, 1980, the Board amended Regulation D to increase the marginal reserve requirement to 10 percent and to reduce an institution's managed liabilities base by the greater of 7 percent or the amount of decrease in an institution's daily average gross loans to non-U.S. residents and gross balances due from foreign offices of other institutions between the base period (September 13-26, 1979) and the statement week ending March 12, 1980. An institution's base will be reduced further after March 12 by the amount by which it decreases its daily average gross foreign loans during a statement week. However, in no event will the base of an institution that was a net borrower of managed liabilities during the base period (September 13-26, 1979) be reduced below \$100 million.

The purpose of this action is to control further the expansion of bank credit at large banks. The action was effective for marginal reserves required

to be maintained during the seven-day period beginning April 3, 1980, against total managed liabilities outstanding during the seven-day period beginning March 20, 1980.

A similar requirement was effective, under the terms of the Credit Control Act, for large non-member banks beginning March 20, 1980.

Board Publishes New OTC Stock List

The Federal Reserve Board has published a newly revised list of 1,252 over-the-counter (OTC) stocks that are subject to its marginal regulations. The new list, effective April 7, 1980, reflects the following changes:

- 94 stocks have been added to the list.
- 9 stocks previously on the list have been removed for failing to meet the requirements for continued listing.
- 62 stocks have been taken off the list because of the companies' listing on a national securities exchange or acquisition by other firms.

The changes are a result of the Board's monitoring the market activity of all OTC stocks. Stocks on the list are subject to the same margin requirements, currently 50 percent, as stocks listed on national stock exchanges.

Margin regulations generally limit the amount of credit a person or firm may obtain to buy, or carry, securities. For OTC stocks the requirements apply only to credit extended on the date the stock becomes an OTC margin stock and thereafter. The stocks on the revised list immediately became subject to margin regulations for new purchases.

