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Tax-Based Incomes Policies

GIVEN the institutional features and ethical norms of modern labor markets and the income-maintenance programs of the welfare state, it appears that substantial macroeconomic slack is required to keep the rate of wage inflation and therefore the rate of price inflation from accelerating. Because of these deviations from a purely atomistic, competitive labor market, the unemployment rate required to prevent a rise in wage inflation is economically inefficient. The central policy problem, therefore, is to reduce this nonaccelerating-inflation rate of unemployment (NAIRU) of the economy.

The aim of an incomes policy is to introduce a direct restraint on the growth rate of money wages and salaries, so that less macroeconomic slack is required to keep the inflation rate from accelerating. Traditionally there have been two methods of implementing an incomes policy: persuasion and controls. Each has serious shortcomings as a permanent policy.

A microeconomic perspective, however, leads naturally to tax incentives, a new method of implementing an incomes policy. A comparison with the environmental pollution problem is instructive.[1] Few economists seriously advocate persuasion because in the microeconomic sphere it is taken as an axiom that each economic agent will pursue his own self-

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1. This analogy is developed in Laurence S. Seidman, "A New Approach to the Control of Inflation," *Challenge,* vol. 19 (July/August 1976), pp. 39–43, and Abba P. Lerner, "Stagflation—Its Cause and Cure," *Challenge,* vol. 20 (September/October 1977), pp. 14–19.

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interest. At the same time, most economists reject controls—the use of regulatory quotas for each polluter—as economically and administratively inefficient. Instead, economists generally advocate effluent taxes to "internalize the externality" of pollution.

Similarly, the excessive NAIRU can also be viewed as a microeconomic problem. Suppose that the institutional features and ethical norms of modern labor markets and the income-maintenance programs of the welfare state cause the average individual firm to raise its rate of wage increase (relative to that of the last period) at an unemployment rate at which the marginal unemployed worker would prefer work (for a wage equal to his marginal product) to leisure or job search. Then the wage behavior of the firm imposes an external cost on society in either of two forms. If monetary and fiscal policy attempt to maintain this unemployment rate, the public "bad" called accelerating inflation is generated. If monetary and fiscal policy accept a higher unemployment rate to control inflation, the result is above-optimal unemployment and lost output, the value of which exceeds the value of leisure or job search to the marginal unemployed workers.

It should therefore be natural for economists to prescribe a tax to internalize the externality, so that each firm must weigh the social cost of raising the NAIRU when it sets its wage increase. This is exactly the strategy embodied in the tax-based incomes policy (TIP) suggested several years ago by Sidney Weintraub and Henry Wallich. They proposed "to levy a surcharge on the corporate profits tax for firms granting wage increases in excess of some guidepost figure. If the wage guidepost were 5.5 per cent, and a wage increase of 7 per cent were granted, the corporate profits tax for the firm would rise above the present 48 per cent by some multiple of the 1.5 per cent excess."[2]

The proposal implies a tax rate t for the ith firm, as follows:

$$t_i = b + m(w_i - n), \qquad m > 0, \tag{1}$$

where

b = the base tax rate

w_i = the average wage increase (percent) at firm i, including executive compensation and fringe benefits

n = the interim TIP target for wage increases (percent)

m = the TIP "multiplier" (policy parameter).

2. Henry C. Wallich and Sidney Weintraub, "A Tax-Based Incomes Policy," *Journal of Economic Issues,* vol. 5 (June 1971), p. 2.

Alternative tax-based incomes policies are possible.[3] In this paper the acronym TIP will refer to any of these variants. A TIP can provide a penalty for a w_i above a target, a reward for a w_i below a threshold, or both (if the threshold equals the target). It can be continuous, so that the size of the penalty or reward varies directly with the divergence from the target or threshold; or it can be discontinuous (all or none), so that the firm either does or does not reach the target, thereby avoiding a fixed penalty or earning a fixed reward. The incentive can be aimed at employees, either in addition to or in place of the employer incentive. A central objective of this paper will be to compare alternative TIPs.

After several years of dormancy, the tax-incentive approach to incomes policy is emerging as a major policy option. It has recently received attention in the press and is a topic of concern among policymakers.[4] A growing number of economists have shown their support.[5] Despite this new

3. A proposal receiving serious attention is described by Arthur M. Okun in "The Great Stagflation Swamp," *Challenge,* vol. 20 (November/December 1977), p. 13, as follows: *"Tax relief for price-wage restraint . . .* a tax-relief incentive should be offered to workers and businessmen who enlist in a cooperative anti-inflationary effort. To qualify for participation, a firm would have to pledge, at the beginning of 1978, to hold the average rate of wage increase of its employees below 6 percent and its average rate of price increase below 4 percent (apart from a dollar-and-cents pass-through of any increases in costs of materials and supplies) during the course of the year. In return for participation, employees of the firm would receive a tax rebate (generally through withholding) equal to 1.5 percent of their wage or salary incomes with a ceiling of $225 per person; and the firm would receive a 5 percent rebate on its income tax liabilities on domestic operating profits."

An employee incentive, intended as a complement to the Weintraub-Wallich incentive, is analyzed in Laurence S. Seidman, "A Payroll Tax-Credit to Restrain Inflation," *National Tax Journal,* vol. 29 (December 1976), pp. 398–412. Modifications to TIP are suggested in Lerner, "Stagflation—Its Cause and Cure," pp. 14–19. An excellent survey of alternative incentives is given by Michael P. Fogarty, "Fiscal Measures and Wage Settlements," *British Journal of Industrial Relations,* vol. 11 (March 1973), pp. 29–65.

4. "Another Weapon against Inflation: Tax Policy," *Business Week,* no. 2503 (October 3, 1977), pp. 94, 96; "Some New Ideas for Release," *New York Times,* October 17, 1977; Michael Ruby and others, "Carter's New Option Play," *Newsweek,* vol. 90 (November 28, 1977), pp. 91–92; U.S. Congressional Budget Office, *Recovery with Inflation* (Government Printing Office, July 1977), pp. 39–41; *The 1977 Midyear Review of the Economy,* Report of the U.S. Joint Economic Committee, 95:1 (GPO, 1977), pp. 76–77.

5. William D. Nordhaus reflected this sentiment in "Inflation Theory and Policy," *American Economic Review,* vol. 66 (May 1976), p. 64: "There is probably no . . . ideal anti-inflation policy, but economists have shown little inventiveness in designing durable antidotes to inflation other than recessions. One serious suggestion

attention, only a few serious analyses have been attempted within the economics profession.[6] There is currently a large disparity between the public interest devoted to TIP, and the analysis provided by economists. This paper seeks to contribute to closing this gap.

Several previous analyses have focused primarily on the microeconomic response of the firm or its employees (or union).[7] A distinctive feature of this paper is that it tries to integrate the microeconomic analysis of firm response with the macroeconomic impact on inflation and unemployment.

Such integration is crucial. TIP is designed to have a direct effect on the wage decision of the firm. The logic may appear to imply that TIP depends crucially on an exogenous wage theory of inflation. Clearly, a satisfactory analysis must address the apparent conflict between that wage view of inflation that seems to underlie TIP and the monetary view of inflation held by many economists, in which, over the longer run, the average growth rate of the money supply is a primary determinant of the inflation rate. The microeconomic analysis of the impact of TIP on the firm must be consistent with the process by which inflation and unemployment are determined in the macroeconomy.

In fact, TIP, the wage view, and the flexible monetary view of inflation are all fully compatible. If the growth rate of the money supply influences the average inflation rate in the long run, the impact of TIP should be

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is an inflation tax which would penalize firms or workers to the extent that they deviated from a national norm."

James Tobin also expressed his concern in "How Dead Is Keynes?" *Economic Inquiry,* vol. 15 (October 1977), p. 467: "The way out, the only way out, is incomes policy. In 1961 the same dilemma . . . inspired the 'guideposts for noninflationary price and wage behavior'. . . . Those guideposts were advisory. But similar standards could be given, if not teeth, at least some carrots and sticks. Use corporate, personal income, and payroll taxes to reward and insure compliant employers and workers, and possibly—as Wallich and Weintraub independently proposed—to penalize violators."

6. An in-depth analysis of the theory and implementation of TIP is provided by Sidney Weintraub, *Capitalism's Inflation and Unemployment Crisis: Beyond Monetarism and Keynesianism* (Addison-Wesley, 1978).

7. Peter Isard, "The Effectiveness of Using the Tax System to Curb Inflationary Collective Bargains: An Analysis of the Wallich-Weintraub Plan," *Journal of Political Economy,* vol. 81 (May/June 1973), pp. 729–40; Yehuda Kotowitz and Richard Portes, "The 'Tax on Wage Increases': A Theoretical Analysis," *Journal of Public Economics,* vol. 3 (May 1974), pp. 113–32; R. W. Latham and D. A. Peel, "The 'Tax on Wage Increases' When the Firm is a Monopsonist," *Journal of Public Economics,* vol. 8 (October 1977), pp. 247–53.

to lower the NAIRU—enabling the economy to function at a lower unemployment rate without causing the inflation rate to accelerate. Proper monetary growth would then be required to achieve an average inflation rate near zero over the longer run. From this perspective, contrary to some popular discussion, TIP should not be regarded as a policy that tries to reduce the inflation rate permanently, even in the presence of excessive monetary growth. Instead, it should be considered a policy to reduce the NAIRU permanently.

Nevertheless, TIP deserves its description as an anti-inflation policy. At the NAIRU prior to TIP—apparently in the 6 percent range for the United States currently—TIP should cause wage and price inflation to decelerate gradually, rather than remain constant. It is true that the deceleration of inflation will only be permanent if the growth rate of the money supply is simultaneously reduced, and that a deceleration of monetary growth, even without TIP, would eventually bring down the inflation rate, but only at the cost of a prolonged, deep recession. TIP, however, enables monetary policy to reduce the inflation rate without imposing that cost.

TIP also deserves to be called an anti-inflation policy in light of the political economy of inflation and unemployment. Without TIP, the economy is characterized by an excessive NAIRU that entails significant hardship for particular social groups in the labor market. Political pressure will therefore be exerted on policymakers to reduce the unemployment rate below the excessive NAIRU in order to reduce that hardship. The result, however, is gradually accelerating inflation. If TIP succeeds in bringing down the NAIRU, hardship can be reduced without causing inflation to accelerate. With TIP and the lower NAIRU, the economy is likely to generate less inflation, given political concern for the unemployed.

In this paper I outline a classification scheme for alternative TIPs. I analyze the impact of a TIP imposed on the employer (an employer TIP) in a value-maximization model and also in a collective bargaining model. The difference between a penalty TIP and a reward TIP is illuminated. I link this microanalysis to a macromodel of wage and price inflation and analyze the impact of TIP on the NAIRU of the economy. I then compare an employee TIP to an employer TIP. Next, the welfare economics of TIP is examined—its impact on allocative efficiency and income distribution. Finally, conclusions and recommendations are presented.

A Taxonomy of Alternative TIPs

A TIP can provide an incentive for the employer, the employees, or both at a firm. It is useful to distinguish a penalty TIP from a reward TIP. Under a penalty-only TIP, the employer, or employees, are subject to a higher tax rate if w_i is greater than the interim target; but if w_i is less, the tax rate remains at the base. The target is assumed to be less than what the average firm would have granted without TIP. Thus, under a penalty-only TIP, t_i is given by equation 1 if w_i is greater than or equal to n, but equal to b if w_i is less than n. Under a reward-only TIP, the tax rate would be given by 2 below if w_i is less than or equal to g, but would equal b if w_i is greater than g:

$$t_i = b - m(g - w_i), \qquad m > 0, \tag{2}$$

where g is the "threshold" percentage wage increase.

Under a penalty-only TIP in 1, for w_i greater than or equal to n, a 1 percentage point increase in w_i raises t_i by m. Similarly, under a reward-only TIP in 2, when w_i is less than g, an increase of 1 percentage point in w_i raises t_i by m. For a penalty-only TIP, a 1 point increase in w_i raises the penalty by m. For a reward-only TIP, a 1 point increase in w_i reduces the reward by m. In both cases, the marginal tax penalty $\partial t_i/\partial w_i$ is identical (equal to m). Thus, a given marginal tax penalty m can be provided by either a penalty-only TIP or a reward-only TIP.

An example will illustrate. Suppose that b is 48 percent and m is 4. Under a penalty-only TIP, assume n is 6 percent. If the firm raises w_i from 6 percent to 7 percent, its tax rate will increase from 48 percent to 52 percent, or by 4 percentage points. Under a reward-only TIP, assume g is 8 percent. If the firm raises w_i from 6 percent to 7 percent, its tax rate will increase from 40 percent to 44 percent, or by 4 percentage points.

Without TIP, a 1 point increase in w_i causes a given decline in gross (before-tax) profit π^G and therefore, for a fixed tax rate, a given decline in net (after-tax) profit π^N. If an employer TIP were introduced (either a penalty-only or a reward-only TIP), a 1 point increase in w_i would cause the same decline in gross profit that would occur without TIP; but because it also would raise the tax rate, it would cause a greater decline in net profit than would occur without TIP. This change in the value of

$\partial\pi^N/\partial w_i$ is called the TIP incentive effect. A comparable TIP incentive can be provided by either a penalty-only TIP or a reward-only TIP because it depends primarily on m. This can be shown as follows:

$$\pi^N = (1 - t_i)\pi^G. \tag{3}$$

Without TIP, because t_i is not a function of w_i,

$$\frac{\partial\pi^N}{\partial w_i} = (1 - b)\frac{\partial\pi^G}{\partial w_i}. \tag{4}$$

With either a penalty-only TIP (t_i given by 1) or a reward-only TIP (t_i given by 2):

$$\frac{\partial\pi^N}{\partial w_i} = (1 - t_i)\frac{\partial\pi^G}{\partial w_i} - \pi^G \cdot m. \tag{4a}$$

The change in $\partial\pi^N/\partial w_i$ due to TIP is obtained by subtracting 4 from 4a:

$$\left(\frac{\partial\pi^N}{\partial w_i}\right)_{TIP} - \left(\frac{\partial\pi^N}{\partial w_i}\right)_{No\ TIP} = (b - t_i)\frac{\partial\pi^G}{\partial w_i} - \pi^G \cdot m. \tag{5}$$

At the w_i' for which $\partial\pi^G/\partial w_i$ is zero, the TIP incentive effect would equal $(-\pi^G \cdot m)$ for both a penalty-only TIP and a reward-only TIP. At other w_i, the TIP incentive effect would still depend primarily on m, whether TIP was penalty or reward, as long as the magnitude of the second term dominated the magnitude of the first term. It will be a convenient simplification to regard the TIP incentive effect as primarily determined by m, the marginal tax penalty. The above can be applied to an employee TIP by simply substituting employee gross income for gross profit, and net income for net profit.

Consider a TIP for which 1 holds for w_i less than n as well as w_i greater than or equal to n and a TIP for which 2 holds for w_i greater than g as well as w_i less than or equal to g. Then for both these TIPs, t_i is given by:

$$t_i = B + mw_i, \qquad m > 0, \tag{6}$$

where

$B = b - mn$ for t_i given by 1, and
$B = b - mg$ for t_i given by 2.

Under both, $\partial t_i/\partial w_i$ equals m for all w_i. For the TIP given by 1, the dividing line between penalty and reward (relative to the base tax rate b) is w_i equal to n. For the TIP given by 2, the dividing line is w_i equal to g. Although a TIP given by 6 for all w_i has both a penalty range and a reward range, it will be shown later that it is essential to make the following distinction. Let w^* be the wage increase that the average firm would have granted in this period without TIP. Then if $t_i(w^*)$ is greater than b in 6, it will be called penalty-reward TIP, in that order; if $t_i(w^*)$ is less than or equal to b, it will be called reward-penalty TIP. Because it is a hypothetical wage increase, w^* cannot be known with certainty either before or after TIP is enacted. If it is assumed that w^* equals w_0 (where w_0 is the wage increase in the period preceding the introduction of TIP), then TIP can be identified as a penalty-reward TIP depending on whether $t_i(w_0)$ is greater than b.

An example will illustrate. Suppose an employer TIP is introduced with t_i given by equation 1 for all w_i, and n is 6 percent, so that the dividing line between penalty and reward is 6 percent. The current U.S. w_0 is 8 percent. If w^* is also 8 percent, this would be a penalty-reward TIP. On the other hand, suppose that t_i is given by 2 for all w_i and g is 8 percent, so that the dividing line between penalty and reward is 8 percent. Then this would be a reward-penalty TIP. The key issue is this: if the firm grants 8 percent—the average wage increase projected to occur without TIP—would the tax rate increase relative to the base, or would it remain the same or decrease? I indicate below why this distinction is of great importance.

If t_i were given by 6 for all w_i, then TIP would be fully continuous. At each w_i, $\partial t_i/\partial w_i$ equals m. Under a penalty-only TIP, the incentive is only partly continuous. For w_i greater than n, $\partial t_i/\partial w_i$ equals m; but for w_i less than n, $\partial t_i/\partial w_i$ equals 0. Similarly, a reward-only TIP is only partly continuous. Under an all-or-none TIP, the incentive is completely discontinuous. Under an all-or-none, penalty TIP, t_i is greater than b by a fixed amount for all w_i greater than n; but t_i equals b for all w_i less than or equal to n. Under an all-or-none, reward TIP, t_i is less than b by a fixed amount for all w_i less than or equal to g; but t_i equals b for all w_i greater than g.

In summary, two points deserve emphasis. First, any partly or fully continuous TIP can provide the same incentive effect, whether it is penalty (penalty-only or penalty-reward) or reward (reward-only or reward-

penalty) because the TIP incentive effect depends primarily on the TIP multiplier m. Either a penalty or a reward TIP can increase the loss to the employer or reduce the gain to employees, from a given increase in w_i.

Second, any penalty TIP (penalty-reward, penalty-only or all-or-none) differs from any reward TIP (reward-penalty, reward-only, or all-or-none) as follows. For any penalty TIP, $t_i(w^*)$ is greater than b; for any reward TIP, $t_i(w^*)$ is less than or equal to b. Any penalty TIP would raise the tax rate above the base rate if the average firm granted the same w^* it would have granted without TIP. Any reward TIP would not raise the tax rate if the same w^* were granted.

The employer TIP proposed by Weintraub and Wallich is implemented through the income tax of the firm. The incentive could be attempted on another tax, such as payroll or sales. It has been suggested that the wage bill in excess of the guidepost be disallowed as a deduction for the computation of income tax liability by the firm. The analysis below of the employer TIP will focus on the income tax, but a brief comparison with other taxes will also be given. The employee TIP can be implemented by adjusting withholding rates.

I limit the analysis to tax incentives to reduce wage and salary increases (including executive compensation and fringe benefits). Tax incentives to reduce price increases are not examined, for a number of reasons.

First, the crucial practical problem for the tax incentive is defining and measuring the wage or price increase of the firm. For wage increases this is likely to be difficult, but appears feasible. For this purpose "wages" under TIP mean all types of employee compensation, including fringe benefits. It seems doubtful, however, that the average price increase of a firm could be satisfactorily measured for tax purposes. Most firms make products with a variety of qualities. It is extremely difficult to distinguish a price increase from a quality increase. Because the quality problem seems much more serious for prices than for wages, it seems sensible to concentrate on wage incentives. Second, as will be shown, theory and empirical evidence strongly suggest that price inflation will decline automatically when wage inflation declines. Third, as will be explained below, there are other more practical ways to protect labor, even if no direct attempt were made to restrain prices. And fourth, a price target for individual firms is less defensible than a wage target. The variance of wage increases among firms appears to be smaller than that of price increases

because the former is limited by labor mobility across firms, and perhaps by conceptions of equity. Different growth rates of productivity across firms cause a larger variance in unit cost increases, and therefore in price increases.

Finally, a nontax permit form of wage incentive such as Lerner suggests should be noted.[8] According to this plan, the government would fix the number of wage permits and let employers bid for permits, with price set by supply and demand. While appealing in theory, the practical aspects of the permit proposal would require careful scrutiny. For example, the impact of precautionary and speculative motives on the permit market would have to be assessed. Even if these practical difficulties prove decisive, the wage permit proposal is a close intellectual cousin of the tax incentive, and helps illuminate the underlying logic of the incentive approach.

The Impact of TIP in a Value-Maximization Model

I now turn to an analysis of the impact of an employer TIP on the optimum wage increase of the firm. The firm is assumed to be a monopsonistic competitor in its labor market, confronting an upward-sloping labor supply curve; and a monopolistic competitor in its product market, facing a downward-sloping demand curve. Initially, nonunion wages are considered (collective bargaining will be discussed below).

In this model, the objective of management at firm i is to choose the wage that maximizes the present value of the firm. Given the wage of the last period, the choice of the optimum wage is equivalent to the choice of the optimum percentage wage *increase* for this period. Throughout this paper the choice variable will be w_i, the percentage wage increase.

The value-maximization model is presented in detail in the appendix. Here, its main features will be summarized. The model has two objectives: to contrast a penalty TIP with a reward TIP and to explain why a penalty TIP should be able to reduce the firm's wage increase without causing an actual rise in its tax rate or an actual squeeze in its after-tax profit.

The key features of the value-maximization model, in which management considers future as well as current net profit, can best be appre-

8. In "Stagflation—Its Cause and Cure" and in his report in this volume.

ciated by first considering a myopic profit-maximization model, in which management considers only current net profit. The main implication of the myopic model is that the incentive to reduce w_i under a penalty TIP and a reward TIP with the same TIP multiplier would be identical.

For a monopsonistic-monopolistic firm there is a w_i' that maximizes current gross profit; if the firm granted a lower w_i, the reduction in labor supply and output would outweigh the lower wage per man-hour, thereby reducing current gross profit. If the tax rate of the firm were independent of w_i, the same w_i' would also maximize current net profit (according to 4). In the myopic model, management chooses this w_i'—so that both $\partial\pi^G/\partial w_i$ and $\partial\pi^N/\partial w_i$ are zero.

If either a penalty TIP or a reward TIP were introduced with a given m, $\partial\pi^G/\partial w_i$ would still be zero at w_i'; but $\partial\pi^N/\partial w_i$ would now be negative and equal to $(-\pi^G \cdot m)$, as shown in 4a. A reduction in w_i still would not raise gross profit at w_i'; but it would now raise net profit by reducing the tax rate t_i, which TIP makes a function of w_i. The magnitude of the incentive to reduce w_i, measured by $(-\pi^G \cdot m)$, depends on m and is the same whether TIP has a penalty or a reward. Moreover, the new optimum under TIP, w_i'', would also depend primarily on m. According to 4a, w_i'' would occur where the loss in gross profit from a further decrement in w_i exactly offsets the reduction in t_i, so that there would be no further increase in net profit.

The myopic model therefore implies that TIP would reduce w_i. But it would also reduce employment because a lower wage corresponds to a lower supply of labor. Furthermore, the myopic model implies that a penalty TIP that would severely squeeze net profit if the firm remained at w_i' would provide no stronger incentive to reduce w_i than a reward TIP. The reason is that there is no slack with respect to current net profit in the myopic model. Without TIP, the w_i' is chosen that would maximize current gross profit, and therefore net profit. If a profit squeeze threatened, management might not be able to reduce w_i in order to raise gross profit. Without TIP, if a decline in product demand threatened to squeeze net profit, management might still choose the same w_i' because that choice might still maximize net profit.

This feature of the myopic model is counter to intuition, which would lead the analyst to believe that, in response to a potential squeeze in current net profit, management would choose a smaller w_i and this would, in turn, succeed in partly mitigating the decline in net profit. A value-

maximization model is presented below that embodies the above intuition, and predicts that a penalty TIP probably will provide a stronger incentive to reduce w_i than a reward TIP with the same m.

In the myopic model, management chooses the w_i that maximizes current net profit. In contrast, management in the value-maximization model finds it optimal to grant a w_i above the level that would maximize current net profit because a larger wage increase is regarded as an investment in personnel policy: it contributes to employee satisfaction with the firm, and this is expected to reduce future quit rates, recruitment and training costs, and therefore to increase future net profits. The firm operates to the left of its labor supply curve at the wage increase it grants. To maximize present value, it is optimal for management to sacrifice some current profit in order to raise future net profit through an investment in personnel policy.

This means that, beginning at the optimum wage increase, the firm has the ability to raise current net profit by reducing its wage increase; there is slack with respect to current net profit. Moreover, the firm can accomplish this without reducing employment.

The second key assumption of the value-maximization model is that if the level of current net profit declines, an increment of net profit will become more valuable relative to an increment of investment in personnel policy. In response to a threatened squeeze in the level of net profit, management will therefore find it optimal to reduce w_i and therefore its investment in personnel policy in order to raise current net profit.

This change in the marginal rate of substitution between current net profit and personnel investment when current net profit declines seems intuitively plausible. It would occur, by definition of the marginal rate of substitution, if the impact of an increment of net profit on the value of the firm increases proportionally more than the impact of an increment of personnel investment on the value of the firm when current net profit declines. This is likely to be the case through effects on the cost of capital.

The firm's cost of capital from retained earnings is generally viewed as less than the cost from external borrowing (which, in turn, is less than the cost from new equity). Consider a firm with current net profit larger than planned investment, so that it can finance its investment from retained earnings. If its current net profit declined, at first there would be no change in its cost of capital. If its net profit declined sufficiently,

however, it would be forced to finance its investment partly from external borrowing, thereby raising its cost of capital.

Moreover, it seems plausible that each decrement of current net profit will cause a larger increment in the cost of external borrowing. Beyond some point, a decrement of net profit will probably raise the risk premium imputed by creditors and included in the cost of external borrowing; and each successive decrement may cause a larger increment in the risk premium as the prospect of loan default becomes greater.

Thus, once current net profit declines beyond some point, each successive decrement in current net profit will cause a larger increment in the cost of capital. Conversely, if the firm is at a low, rather than a high, level of current net profit (relative to its investment options), an increment of current net profit should cause a larger decrement in the cost of capital and thus yield a greater increment in firm value.

The personal incentives of management may also change the marginal rate of substitution in favor of current net profit when the level of current net profit declines. Suppose management believed that the board of directors (and perhaps also the stockholders) regarded current net profit as a tangible indicator of the competence of management. Thus, current net profit may serve as a signal when there is a disparity in information between management and the board (and perhaps stockholders). As long as the firm's current net profit rate is "normal," it will be optimal for management to undertake any investment—such as one in personnel policy—that is expected to raise the value of the firm. If the level of net profit declines significantly below normal, however, it may be optimal for management to sacrifice some investment in personnel policy to raise current net profit in order to protect its own position.

If the two key assumptions of the value-maximization model are correct, a penalty TIP would almost certainly provide a stronger incentive to reduce w_i than a reward TIP with the same TIP multiplier m. Both a penalty TIP and a reward TIP raise the absolute value of $\partial \pi^N / \partial w_i$ by an amount that depends primarily on m. But according to the value-maximization model, there is also an income effect. This means that if a current net profit squeeze were threatened by a penalty TIP, in contrast to a reward TIP, management would have the ability, and find it optimal, to reduce w_i in an attempt to mitigate the decline in current net profit. At w_i^*, the optimum wage increase without TIP, a penalty TIP would

use both the substitution and the income effects to provide an incentive to reduce w_i; in contrast, a reward TIP would rely solely on the substitution effect.

The central feature of the value-maximization model—that the level of current net profit influences the size of the wage increase—is supported by econometric evidence. Table 1 presents econometric estimates for a wage equation from a time series of U.S. manufacturing. By abstracting from the distributed lags in that fitted equation, its basic form can be represented as:

$$(7) \quad w_t = r\left(\frac{\bar{U} - U_t}{U_t}\right) + z\left(\frac{\pi_t^N - \bar{\pi}^N}{\bar{\pi}^N}\right) + w_{t-1}, \quad r > 0, \quad z > 0,$$

where

w = growth rate of money wages
U = unemployment rate
π^N = net profit rate
$\bar{U}, \bar{\pi}^N$ = parameters of the economy.

The equations in table 1 differ solely according to the adjusted unemployment rate variable used. The t statistic for the profit variable exceeds four in all three equations. A special test suggested by J. Durbin for equations with lagged right-hand dependent variables indicates that the probability of autocorrelation, with its serious econometric implications when w_{t-i} is on the right, fortunately is low in these equations. More detailed analysis of these and related wage equations is presented elsewhere.[9] The result for the profit variable is important for choosing between a penalty and a reward TIP, and further econometric research on it should receive high priority.

The second important conclusion provided by the value-maximization model is that, although a penalty TIP threatens a net profit squeeze if the firm fails to reduce w_i, it *need not* cause an actual net profit squeeze if the TIP multiplier m is set at the proper magnitude. That result is demonstrated in the appendix; here, the argument will be summarized.

At each w_i, TIP causes a larger decrement in net profit as a result of a given increment in wages because the TIP incentive effect makes the tax rate vary directly with w_i. Let w_i^* be the optimum without TIP, and

9. Laurence S. Seidman, "The Return of the Profit Rate to the Wage Equation," *Review of Economics and Statistics* (forthcoming).

Table 1. Wage Equations for U.S. Manufacturing, Quarterly, 1955:2–1975:2[a]

	Independent variable[b]				*Regression statistic*		
Equation	*Constant*	*Profit measure*	*Unemployment measure*[c]	w_{t-i}	$\bar{R}^2$	*Standard error*	*Durbin-Watson*
1.1	−5.58	5.58	2.00	0.94	0.73	1.21	2.03
	(−4.08)	(4.19)	(1.45)	(8.58)			
1.2	−6.26	6.10	3.24	0.94	0.73	1.20	2.08
	(−4.43)	(4.26)	(1.23)	(8.82)			
1.3	−6.60	6.12	6.07	0.88	0.74	1.18	2.11
	(−4.71)	(4.43)	(2.00)	(8.06)			

Sources: The dependent variable, the rate of change in the hourly earnings index, and data on unemployment rates were provided by the U.S. Bureau of Labor Statistics. The profit variable, π_{t-i}, is the ratio of the actual after-tax profit rate on equity to the normal profit rate for that quarter, estimated as a linear trend, and is from U.S. Federal Trade Commission, *Quarterly Financial Report for Manufacturing, Mining and Trade Corporations*, various issues.

a. All regressions were estimated using the technique of ordinary least squares. The numbers in parentheses are t statistics.

b. Each variable is a polynomial-distributed lag of second degree; π_{t-i} and U_{t-i} are lagged four quarters, beginning in $t-1$ (constrained to zero in the fifth quarter), while w_{t-i} is lagged twelve quarters (constrained to zero in the thirteenth). The coefficient shown for each variable is the sum of the individual lag coefficients, and the t statistic applies to the sum.

c. Equation 1.1 uses the inverse of the unemployment rate for prime-age males; 1.2 uses the inverse of the weighted unemployment rate described in George L. Perry, "Changing Labor Markets and Inflation," *BPEA, 3:1970*, pp. 415–16; and 1.3 uses UGAP, described in Michael L. Wachter, "The Changing Cyclical Responsiveness of Wage Inflation," *BPEA, 1:1976*, pp. 125–33.

w_i^{**} be the optimum under a penalty TIP (w_i^* greater than w_i^{**}). At w_i^*, the penalty TIP threatens a net profit squeeze because $t_i(w_i^*)$ is greater than b. For some appropriate value of m, the new optimum w_i^{**} will equal the TIP target n; and $t_i(w_i^{**})$ will equal b, so that no actual net profit squeeze occurs. Thus, it may be optimal for management to choose a wage increase at which the tax rate is unaltered, solely because $\partial\pi^N/\partial w_i$ has been raised in absolute value by TIP.

It is instructive to contrast a penalty TIP with an increase in b, the ordinary income tax rate. At w_i^*, both threaten a net profit squeeze, and both would cause the firm to reduce w_i. In the case of an increase in the ordinary tax rate, however, the final equilibrium w_i^{**} must involve a higher tax rate, and therefore a lower level of net profit because t_i equals b for all w_i.

Thus, the impact of TIP at w_i^* and w_i^{**} must be carefully distinguished. Both a penalty TIP and a reward TIP sustain the new optimum, w_i^{**}, primarily through the TIP incentive effect. The difference between a penalty TIP and a reward TIP is important at w_i^*, the wage increase that would have been chosen without TIP. A reward TIP would not

decrease the level of current net profit at w_i*; in contrast, a penalty TIP would squeeze net profit at w_i*. Thus, it is almost certain that a penalty TIP will provide a stronger incentive to reduce w_i below w_i*.

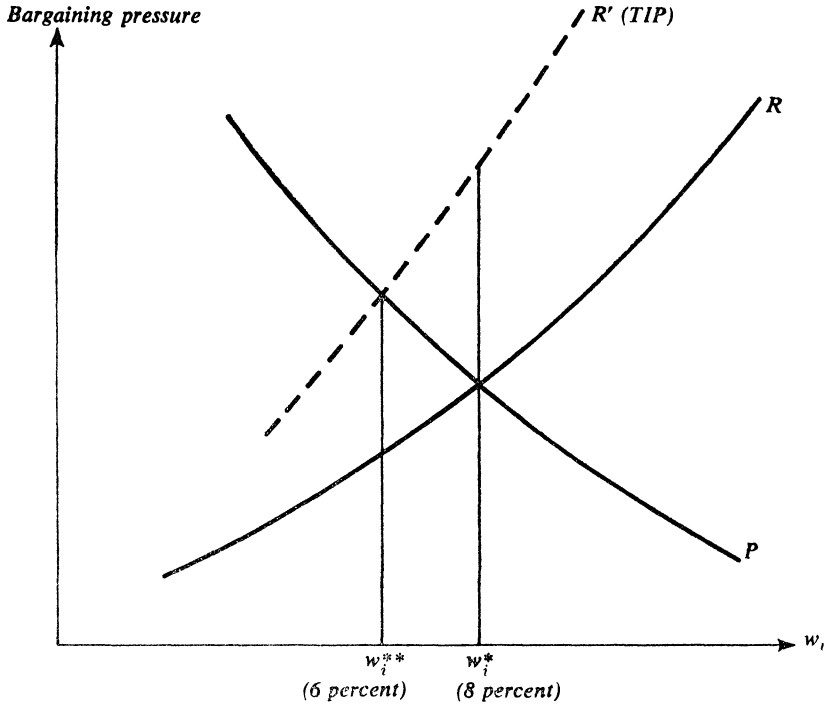
The Impact of TIP in a Collective Bargaining Model

Perhaps the most important and difficult test for TIP is whether it can reduce the wage increase in an oligopolistic industry, in which large corporations engage in industry-wide (explicit or implicit) collective bargaining with a "strong" union.

The basic assumption of the collective bargaining model is that the actual wage increase in a given industry can be regarded as the result of the interaction of union "push" (P) and management "resistance" (R). The interaction of union push and management resistance, prior to the introduction of TIP, is shown in the diagram, which seeks to explain why the wage increase was 8 percent. As the diagram shows, if a 6 percent increase had been tentatively considered at the bargaining table, the union's push for a larger raise would have exceeded management's resistance to it. Similarly, if a 10 percent increase had been considered, management's determination to achieve a lower settlement would evidently have exceeded the union's determination to prevent such a reduction. At 8 percent, labor's push and management's resistance are balanced.

Push and resistance should be regarded as bargaining postures or attitudes that imply particular concrete actions. For example, union push at 8 percent would increase if workers were willing to endure a longer strike in order to achieve some extra raise. Similarly, management resistance at 8 percent would increase if it were willing to endure a longer strike in order to prevent a given increment.

What determines the shape and position of the two curves? The union's push for an additional increment is positive at all tentative w_i. But the larger the tentative w_i, the smaller the push. Workers are willing to endure a strike of only X days to raise w_i from 10 to 11 percent, while they would be willing to endure a strike of Y days (with Y greater than X) to raise w_i from 4 to 5 percent. The position of the union-push curve at each w_i will be higher: (1) the greater the rate of wage increase that other workers have recently achieved, (2) the greater the expected rate of price



inflation, (3) the lower the unemployment rate, and (4) the larger the net profit rate expected to result from a given wage. Factors (1) and (2) are based on the assumption that workers are concerned about relative and real wage increases rather than absolute nominal wage increases. Factor (3) is plausible in part because workers might be more willing to risk a prolonged strike and layoffs after the settlement if the prospects of finding a new job were greater. Factors (1) and (3) are consistent with the wage equations presented in table 1. And factor (4) may be plausible because the larger the net profit expected to result from a given w_i, the larger is the apparent ability of management to "afford" higher wages, thereby inducing workers to risk a longer strike to achieve a given increment.

The resistance of management is based on the objective of maximizing the value of the firm (or perhaps the value of its own income stream). In the range relevant for bargaining, the resistance of management to any addition is positive because a larger wage increase would reduce the value of the firm. The larger the tentative w_i, the lower will be the level of net

profit, and therefore the larger will be the resistance to an additional amount, using the reasoning of the previous section. Thus, the resistance of management to a still larger raise at a given w_i is greater (1) the greater the reduction in net profit that would result from the increment, and (2) the lower the level of current net profit at w_i.

This model is consistent with the wage equations presented in table 1. The level of net profit is assumed to affect both push and resistance curves, and should therefore affect the wage increase that results. Factors (1) and (3) that influence the position of the push curve are consistent with the performance of the w_{t-i} and U_t variables, respectively, in table 1.

The introduction of an employer TIP results in an upward shift of the R curve shown in the diagram above. At each w_i, TIP (whether penalty or reward) will increase the decrement in current net profit that results from a given increase in w_i. This is the TIP incentive effect, and its magnitude depends primarily on m. A penalty TIP, in contrast to a reward TIP, however, will also influence the position of the R curve because it will reduce the level of net profit w_i*. This is the penalty TIP income, or profit squeeze, effect at w_i*. Because the penalty TIP combines both substitution and income effects at w_i*, it should generate greater resistance at w_i* than a reward TIP.

Even if the union P curve is unaltered, the upward shift of the R curve should reduce the resulting wage. Under a penalty TIP, however, it is plausible that the P curve will shift down at w_i* because it would reduce the expected net profit rate at w_i* (the fourth influence on the position of the P curve). The shift in the P curve is not shown in the diagram. If the TIP multiplier is properly set, then w_i** will equal n; and the tax rate will equal b, so there would be no actual profit squeeze. As in the value-maximization model, the new optimum w_i** does not require an actual net profit squeeze. At w_i**, the R curve is higher, although the tax rate and level of net profit are unaltered, because an increment in w_i would cause a greater decrement in net profit.

It has thus far been assumed that an increase in the tax rate would in fact reduce current net profit. In an oligopolistic industry, however, the same wage increase often is set for all firms. Is it possible that, in response to a penalty TIP, firms will grant the same w_i*, and then raise price sufficiently so that gross profit increases, offsetting the higher tax rate, and thereby preventing a decline in current net profit at w_i*? In this extreme case in which firms shift the penalty fully in the short run, a penalty TIP would actually temporarily worsen inflation.

I have examined this possibility.[10] The main points of that analysis are summarized below. First, if m is sufficiently large, the tax surcharge must outweigh any rise in gross profit, thereby squeezing net profit at w_i^*. In the extreme, suppose that $t_i(w_i^*)$ equals 100 percent. No matter how much the firm raises gross profits at w_i^*, its net profit will be zero. A key feature of a tax penalty on the income tax of the firm is that, in effect, the Internal Revenue Service "goes last." First the firm raises price in an attempt to raise gross profit; then the Internal Revenue Service taxes a larger portion of the gross profit. For a sufficiently large m, full short-run shifting of the TIP penalty so that net profit is not squeezed at w_i^* is literally impossible. Even with realistic, modest values of m, however, large increases in gross profit would be required to keep net profit from declining. For example, if m were 6 percent and n were 6 percent in equation 1, the tax rate would rise from 48 percent to 60 percent if the firm granted a wage increase of 8 percent. The firm must then be able to raise gross profit by 30 percent to avoid a reduction in net profit.

Moreover, it is far from certain that firms will be able to raise gross profit significantly. Even with industry-wide bargaining, import competition may limit the ability of oligopolists to raise gross profit by increasing prices. Because wages are set separately for different industries, one industry cannot assume that its own wage increase will be matched by others; thus, an industry that significantly exceeds the TIP target may find sales growing more slowly as demand shifts to other industries.

Although partial shifting is certainly possible, it would involve a net profit decline at w_i^*, so that both income and substitution effects would provide an incentive to hold down wages. Despite the reduction in w_i, might the partial shifting worsen price inflation? Briefly stated, in an oligopolistic industry with reserve market power, it is possible, though very unlikely, that shifting would cause a temporary rise in the inflation rate. Even under this worst scenario, the temporary rise would soon be permanently reversed after a transition period when firms raised their markup to cover the higher tax rate. Thereafter, the price inflation rate would follow the decline in the wage inflation rate. A permanent rise in the inflation rate could occur only if there were a permanently rising tax rate—not merely a new, higher tax rate.

If a penalty TIP were only a temporary policy, even the small chance of an initial rise in the inflation rate would be a serious liability. As the

10. Laurence S. Seidman, "Would Tax-Shifting Undermine the Tax-Based Incomes Policy?" *Journal of Economic Issues* (forthcoming, September 1978).

next section will show, however, a penalty TIP should be viewed as a permanent policy with a permanent impact; hence, the small risk of a temporary adverse effect is less serious.

When the penalty tax is levied on the income of the firm—revenue minus cost—in effect, the Internal Revenue Service "goes last." If the penalty tax were levied on either cost or revenue, the shifting problem would be much more serious: in effect, the Internal Revenue Service would "go first," and the firm would "go last." For example, suppose the penalty were levied on the payroll (wage bill) of the firm. The firm might then be able to raise price and revenue sufficiently to maintain net profit. One version of employer TIP—that the wage bill in excess of the guidepost be disallowed as a deduction in the computation of income tax—is in effect a payroll tax surcharge, and would therefore be more vulnerable to shifting than the income tax surcharge.[11]

The Impact of TIP on the NAIRU

The microanalysis thus far has established that, given the recent rate of wage increase throughout the economy, the product demand of the firm, and the unemployment rate, TIP would cause the average firm to grant a smaller wage increase than it otherwise would. However, the final impact of TIP on the macroeconomy can be determined only when the micromodel is linked to a macromodel that relates wage inflation, price inflation, unemployment rate, and money supply. This section will provide such a macromodel.

PRICE BEHAVIOR

Consider the following price equation:

$$p_t = w_t - a, \tag{8}$$

where a is the trend growth rate of average labor productivity (output per man-hour). Here, p refers to increases in the *value-added* price, which nets out the unit cost of purchases from other sectors.

11. Wallich and Weintraub, "Tax-Based Incomes Policy," p. 4.

The derivation of 8 is as follows.[12] First, define the markup $\bar{M}$ of value-added price P over standard unit factor cost UC, where UC excludes intermediate product cost, but includes a minimum rate of return on capital per unit of trend output:

$$\bar{M} \equiv \frac{P}{UC}. \tag{9}$$

Next, consider the markup of price over standard unit labor cost ULC; ULC equals the ratio of wages per man-hour W to trend output per man-hour A. Let F be the ratio of standard unit labor cost to standard unit cost:

$$F \equiv \frac{ULC}{UC}. \tag{10}$$

The markup K of price over standard unit labor cost is defined as:

$$K \equiv \frac{P}{ULC}. \tag{11}$$

From equations 9, 10, and 11:

$$K \equiv \frac{\bar{M}}{F}. \tag{12}$$

If two industries have the same F, then the one with the greater market power will have the larger K. From 11 the following relationship among growth rates must hold approximately:

$$p = k + ulc = k + w - a. \tag{13}$$

The secular trend of k is close to zero, so that 13 is approximated by 8. In 1977, the annual growth rate of wages in the United States was approximately 8 percent; the trend growth rate of productivity, 2 percent; and the inflation rate, 6 percent.

The near-zero trend value of k reflects the behavior over the long run of $\bar{M}$ and F. According to standard microeconomics, the markup of a

12. An early exposition is given in Sidney Weintraub, *A General Theory of the Price Level, Output, Income Distribution, and Economic Growth* (Chilton, 1959). Econometric price equations similar to 8 are presented in Otto Eckstein, ed., *The Econometrics of Price Determination,* A Conference sponsored by the Board of Governors of the Federal Reserve System and Social Science Research Center (Board of Governors, 1972).

firm is determined by the degree of competition in its industry. Whatever the level of $\bar{M}$, its secular trend (ignoring fluctuations over the business cycle) is close to horizontal; the average degree of market power in the economy generally changes only slowly, if at all, over time. Unit factor cost UC equals the sum of unit labor cost and unit nonlabor cost, including unit depreciation cost, unit net capital cost, and unit indirect business tax cost. It is possible that the ratio of unit labor cost to unit nonlabor cost changes only slowly over time.

The fact that the trend value of k is close to zero is crucial for the trend in the distribution of income between labor and capital, as can be seen from 11. However, the main conclusion of this section—that TIP can lower the NAIRU—would hold for any constant k, as will be shown below.

INTEGRATING MONEY INTO THE SYSTEM

Equations 7 and 8 imply a relationship between inflation and unemployment. To focus on this relationship, the following (simplified) inverse correlation between the unemployment rate and the net profit rate will be assumed:

$$\frac{\pi_t^N - \bar{\pi}^N}{\bar{\pi}^N} = c\left(\frac{\bar{U} - U_t}{U_t}\right), \qquad c > 0. \tag{14}$$

When U_t equals $\bar{U}$, π_t^N equals $\bar{\pi}^N$. Substituting 14 into 7 yields:

$$w_t - w_{t-1} = h\left(\frac{\bar{U} - U_t}{U_t}\right), \qquad h = r + zc > 0. \tag{7a}$$

If U_t equals $\bar{U}$, the wage inflation rate remains constant; if U_t is less (greater) than $\bar{U}$, the wage inflation rate rises (falls). To simplify matters, h will be regarded as constant in the relevant range. If 8 is substituted into 7a:

$$p_t - p_{t-1} = h\left(\frac{\bar{U} - U_t}{U_t}\right). \tag{15}$$

It should be noted that if 13 rather than 8 had been substituted into 7a, 15 would still follow, as long as k_t equals k_{t-1}. A constant growth rate of the markup, which may or may not be zero, is sufficient to yield 15.

The system is accelerationist in the following sense. If the monetary and fiscal authorities try to peg U_t below $\bar{U}$, the inflation rate will rise without

limit, rather than converging to any stable rate. This follows from the assumption, supported in table 1, that the coefficient of w_{t-1} in 7a is 1. The system has a NAIRU, defined as the unemployment rate at which the inflation rate would remain constant (not necessarily zero) at its initial value. Prior to the introduction of TIP, the NAIRU is $\bar{U}$, according to 15.

The price equation 8 embodies the wage view of inflation. According to the wage equation 7a, however, w_t is endogenous and depends on U_t, another endogenous variable. This wage-price system is, in fact, consistent with a monetary view of inflation.[13] Given the monetarist assumption that in the long run the growth rate of the money supply s determines the growth rate of nominal income, then if s is held constant, U_t will converge to the NAIRU; p_t and w_t will converge to equilibrium values that depend on s.

The impact of TIP on the wage-price system will now be shown. In the earlier microanalysis, TIP causes a smaller w_i in a particular period than would have occurred in its absence, other things held constant. An important consequence of TIP as a permanent policy is that this effect would occur each period. Suppose that in the first year U_t is at $\bar{U}$, the NAIRU without TIP, so that if w_{t-1} were 8 percent, the average firm would grant 8 percent this year without TIP; and if a were 2 percent, p_t would be 6 percent. Suppose that a penalty TIP with an interim target n of 7 percent would threaten a higher tax rate at 8 percent, and therefore cause the firm to cut w_i by 1 percentage point below w_{t-1}. Thus, w_t would be 7 percent; and p_t, 5 percent. Then in the following year, w_{t-1} would be 7 percent. The labor supply function implied by the value-maximization model and the union push curve in the collective bargaining model would shift to reflect the fact that w_{t-1} equal to 7 percent is the new norm. (And p_{t-1} would be 5 percent.) If n is now cut to 6 percent while m is held constant, a penalty TIP would threaten the same higher tax rate if 7 percent were granted. Once again, this should cause the firm to cut w_t perhaps 1 point below w_{t-1}, to 6 percent.

Let w_t^* be the wage inflation rate that would occur without TIP in period t according to 7, given the values of the right-hand variables U_t, π_t^N, and w_{t-1}. Suppose that in each period, under a permanent penalty

13. Laurence S. Seidman, "The Tax-Based Incomes Policy and the Monetary View of Inflation: A Reconciliation" (University of Pennsylvania, Department of Economics, November 1977; processed).

TIP, n_t were set so that $(w_t^* - n_t)$ were equal to θ, where θ is some constant percentage (1 point in the example just given). Then in each period, with m held constant, a penalty TIP would threaten the same higher tax rate at w_t^* and exert the same downward pressure on w_t at w_t^*. In each period, therefore, a penalty TIP should cause w_t to be less than w_t^*. Thus, a penalty TIP should permanently shift down the wage equation by θ:

$$(7b) \quad w_t - w_{t-1} = r\left(\frac{\bar{U} - U_t}{U_t}\right) + z\left(\frac{\pi^N - \bar{\pi}^N}{\bar{\pi}^N}\right) - \theta, \qquad \theta > 0.$$

Then 7a and 15 become:

$$(7c) \quad w_t - w_{t-1} = h\left(\frac{\bar{U} - U_t}{U_t}\right) - \theta = p_t - p_{t-1}.$$

The new NAIRU would be less than $\bar{U}$ because it takes a lower value of U_t (U^*) to make the middle of 7c equal to zero. Specifically:

$$(16) \quad U^* = \frac{h}{h + \theta}\bar{U} < \bar{U}.$$

Intuitively, the increased downward pressure on w_t due to the TIP incentive effect will now counter the upward pressure from this lower U_t, causing w_t to equal, rather than to exceed, w_{t-1} in 7c at this U_t.

Given the monetarist assumption concerning nominal income and the wage-price system adjusted for TIP, it can be shown that a specific rate of monetary growth would continue to cause the system to converge to the same long-run, equilibrium inflation rate.[14] TIP would not permanently reduce the inflation rate, but rather would permanently reduce the NAIRU.

A numerical example of TIP's impact is provided in table 2. There, without TIP, the system would remain in its initial equilibrium indefinitely, in the absence of shocks, with s kept at 7 percent. Now suppose that a penalty TIP were introduced, and that m and n_t were set so that w_i would be 2 percentage points less than it would otherwise have been for the average firm. Suppose that the h parameter were 0.04. Then from 16 the new NAIRU under TIP would be 4 percent.

One approach to disinflation would be initially to set s_t each year so that U_t remained at 6 percent. Then each year w_t and p_t would decline 2

14. Ibid.

Table 2. A Disinflation Path under TIP[a]
Percent

Year	U_t	w_t	p_t	s_t	n_t	t_i
0	6.0	8.0	6.0	7.0	...	48
1	5.6	6.3	4.3	5.7	6.3	48
2	5.2	4.9	2.9	4.3	4.9	48
3	4.8	3.9	1.9	3.3	3.9	48
4	4.6	3.1	1.1	2.3	3.1	48
5	4.4	2.6	0.6	1.8	2.6	48
6	4.2	2.3	0.3	1.5	2.3	48
7	4.1	2.1	0.1	1.2	2.1	48
8	4.1	2.0	0.0	1.0	2.0	48
9	4.0	2.0	0.0	1.1	2.0	48
10	4.0	2.0	0.0	1.0	2.0	48

Source: Derived from the model presented in Laurence S. Seidman, "The Tax-Based Incomes Policy and the Monetary View of Inflation: A Reconciliation" (University of Pennsylvania, Department of Economics, November 1977; processed).

a. The variables are defined as follows: U_t = unemployment rate, w_t = rate of change in wages, p_t = rate of change in prices, s_t = rate of growth of the money supply, n_t = target rate of increase in wages with TIP, and t_i = the tax rate of a firm with TIP. Initially, $s_0 = 7$ percent, $U_0 = \bar{U} = 6$ percent, and q_0 (the growth rate of real output) = 3 percent. It is assumed throughout that a, the trend growth rate of productivity, and v, the trend growth rate of the velocity of money, each are equal to 2 percent; and the trend growth rate of the labor force is equal to 1 percent.

percentage points and the interim target n_t would be adjusted downward by 2 points. At the end of three years, the permanent targets, w at 2 percent and p at 0 percent, would be achieved. Then s_t should be temporarily increased to reduce U_t to 4 percent. When U_t equals 4 percent, s_t would be set at 1 percent indefinitely, thereby maintaining this equilibrium in the absence of shocks.

This approach, however, makes no progress in reducing U_t until the permanent inflation target is achieved. Furthermore, it requires a rapid expansion at the end of the third year. An alternative disinflation path, shown in table 2, is likely to be regarded as preferable. In each period, n_t is adjusted downward so that, without TIP, w_t* would exceed n_t by 2 percentage points, but with TIP, w_t would approximate n_t. In the final equilibrium, n is permanently set at 2 percent, and w_t permanently remains at 2 percent. In the absence of TIP, when U_t equals 4 percent, w_t* would exceed w_{t-1} by 2 points; TIP just offsets that upward pressure on wage inflation, thereby keeping w_t equal to w_{t-1} (2 percent).

This simple illustration shows how a penalty TIP and monetary policy should ideally be coordinated to reduce gradually both inflation and unemployment rates. However, most of the key magnitudes required to ob-

tain the desired values for m, n_t, and s_t are not known, and at best can only be imperfectly estimated. Thus, in practice, the path to equilibrium cannot be fine-tuned as in table 2. Moreover, other "shocks" will temporarily move the system away from its desired values, and countercyclical monetary and fiscal policies will be necessary to return the system to its targets. Nevertheless, if TIP becomes a permanent feature of the system, it should eventually be possible to achieve an average combination of inflation and unemployment that is lower than what could have been achieved without TIP.[15]

An Employee TIP

An employee TIP could be introduced either in place of an employer TIP or as a complement to it. Elsewhere I have analyzed the employee TIP.[16] In this section, the main issues will be treated.

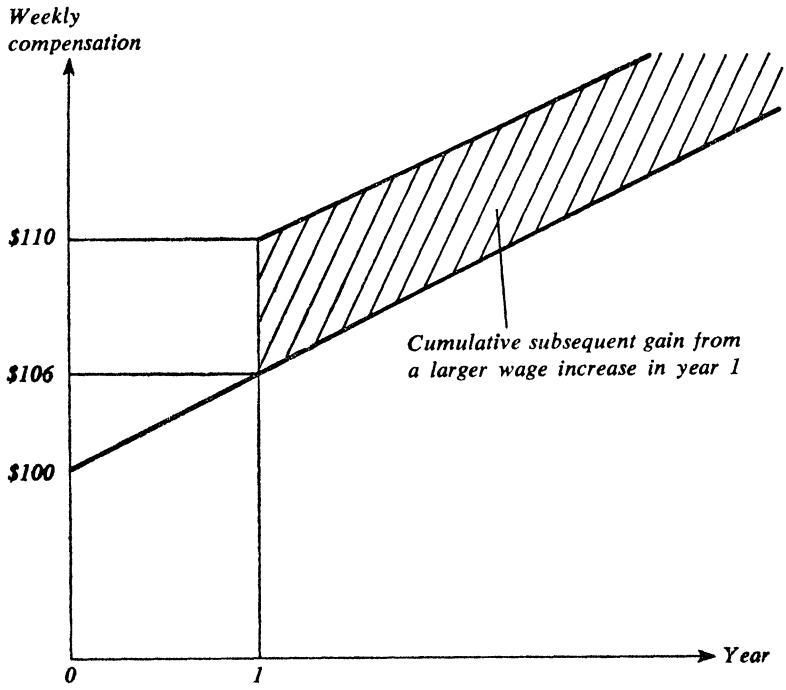
An employee TIP is subject to the same penalty-reward permutations given earlier for an employer TIP. For example, employees at firm i could be given a tax cut if the average wage increase at i were below a threshold, a tax increase if the average wage increase were above a target, or both if the target equaled the threshold.

The reward or penalty for each employee at firm i must depend on the *average* wage increase at i, not on the individual employee's own wage increase, because the purpose of the incentive is to discourage increases in the entire wage structure of the firm, not to discourage promotion and upgrading of individual employees.

One method of implementing an employee TIP is to use the withholding system at each firm. For example, if the wage increase at firm i warranted a tax cut, the actual income tax withholding rate could be cut; but employees could be credited on their W-2 forms as if the withholding rate had not been cut. Under this method, the employee TIP would be fully administered by the employer and would place no additional compliance burden on individual employees. At the same time, employees could be made aware of the employee TIP tax credit or surcharge on each paycheck and on the W-2 form, so that the TIP might influence the bargaining posture of employees.

15. Robert S. Chirinko and Laurence S. Seidman, "The Tax-Based Incomes Policy and Optimal Control," discussion paper 390 (University of Pennsylvania, Department of Economics, February 1977; processed).

16. Seidman, "Payroll Tax-Credit."



If the penalty completely eliminated the gain from exceeding the target or if the reward completely compensated employees for the shortfall below the threshold, the employee TIP would surely reduce w_i. Such an extreme penalty or reward would have harmful consequences, however. A future projection must be made to estimate whether the gain has been completely eliminated or the shortfall fully compensated. For example, suppose in year 0 the average employee at firm *i* received $100 a week, and the interim TIP target was 6 percent, or $106 for *i*. Under the penalty TIP, suppose 100 percent of the excess above $106 was taxed away in year 1. The average employee may still be better off in future years, the larger the wage increase in year 1. One possible projection is shown in the diagram. If the average employee made this particular projection, then to eliminate the gain, the year 1 tax would have to exceed 100 percent, so that the loss in year 1 balanced the gain in future years.

The tax penalty required to eliminate the gain, however, will vary among individual employees because the gain depends on how long the employee will work for firm *i*. For example, an employee who plans to work at *i* for only one year (year 1) would have his gain completely elim-

inated with a 100 percent tax. Thus, a tax penalty that exactly eliminates the gain for the average employee would more than eliminate it for some, and less than eliminate it for others.

A penalty or reward sufficiently large to eliminate exactly the gain for an employee with average expected tenure would produce serious equity and efficiency problems. How would a firm seek to expand its labor force in response to a rise in product demand? For example, suppose that for each \$1 above \$106, employees were taxed \$2; and for each \$1 below \$106, they were rewarded \$2. If \$110 were granted, the tax penalty would be \$8; thus, in year 1, the average employee would receive only \$102; this loss in year 1 might be just balanced by the expected gain in future years from beginning year 2 at \$110. Similarly, if \$102 were granted, the tax reward would be \$8, so in year 1, the average employee would receive \$110; this gain in year 1 might be just balanced by the expected future loss from beginning year 2 at \$102. Thus, the average employee looking ahead might be indifferent to the size of the wage increase in year 1.

Current and new employees who joined in year 1, however, would prefer lower wages if their expected tenure were less than average; and conversely, higher wages if their expected tenure were greater than average. Because some employees would be adversely affected by higher wages, while others would be adversely affected by lower wages, inefficient turnover would be encouraged. Whether the firm raises or lowers its rate of wage increase, it will cause employees who are so affected to consider seeking employment elsewhere. Moreover, potential new employees who might join in year 2 would be more attracted in year 2, the greater the w_i in year 1, because they would not bear the year 1 tax penalty. Without an employee TIP, an employer knows that the larger the wage increase he grants, the more attractive his firm is to all current and potential employees. Under an employee TIP that eliminated the gain to the average employee, this would not be the case.

Because of these equity and efficiency consequences, a permanent employee TIP should not completely eliminate the gain from exceeding the target or completely compensate for the shortfall below the threshold. An increase in wages must still benefit all employees to some degree. This means, however, that it is no longer clear that an employee TIP will provide a strong incentive.

The collective bargaining model can be used to analyze the impact of

an employee TIP under which an increase in wages still provides some positive gain to employees. Earlier, four factors that influence the position of the union push curve were listed. Two additional factors must now be added. The height of the union push curve at a given wage increase will be higher: (5) the greater the increment in real (inflation-adjusted) after-tax income that results from a given increase in wages, and (6) the smaller the gain (from the past year to the current year) in real after-tax income from that wage increase.

Factor 5 is the substitution, or incentive effect, which motivates the employee TIP proposal. As in the case of an employer TIP, the same incentive effect can be achieved by a penalty or a reward employee TIP. Because an employee TIP, whether penalty or reward, reduces the after-tax gain from a given increase in wages, this substitution effect should shift down the union push curve in the first diagram in this paper.

Factor 6 is the income effect. To analyze its impact, consider an employee penalty TIP with an interim target of 6 percent, and suppose that without TIP, wage increases were 8 percent at the average firm (with p at 6 percent for the whole economy). First consider the optimistic view that employees believe that, in response to TIP, the rate of price inflation will be reduced by the full 2 percentage points sought by the program. Then a partial TIP penalty (less than 100 percent) would lead employees to expect a higher real after-tax income for an 8 percent raise with TIP than without it. The expected slowing of inflation under TIP would add 2 percentage points to their real income, outweighing the reduction of real income from the partial TIP penalty. Thus, the income effect would reinforce the substitution effect, helping to shift down the union push curve at 8 percent.

Now consider the pessimistic view that employees do not believe TIP will lower inflation below 6 percent. Then, because of the penalty, a wage increase of 8 percent will be expected to yield a smaller gain in real after-tax income with a penalty TIP than without it. In this case, the income effect would work against the substitution effect. While the substitution effect may still dominate, the result is no longer unambiguous.

An employee TIP must operate through a penalty, with an employee tax rate in which $t_i(w_i^*)$ is greater than b if the average tax rate on employees is to remain unaltered (assuming that TIP succeeds in reducing wage inflation). If the government could afford to reduce the average tax rate on employees, an employee reward TIP might be implemented.

Consider an employee reward TIP with t_i given by equation 2, g equal to 8 percent, and the same b and m as the penalty TIP. Then even under the pessimistic view, such a program should unambiguously reduce wage inflation. The substitution effect is the same as for a penalty TIP, and any income effect associated with a reward will reinforce the substitution effect. Even if employees believe that p will remain 6 percent, the gain from an 8 percent wage increase (which incurs neither a penalty nor a reward) will be unaltered; with no income effect, the substitution effect should reduce wage increases.

It seems doubtful that an employee TIP could be a reliable substitute for an employer penalty TIP. As explained earlier, an employee TIP must not eliminate the gain to employees of increasing wages, and hence it is not clear how strong an incentive it would provide. Under an employer penalty TIP, the firm must reduce w_i below w_i^* to avoid a net profit squeeze. Management is obliged to respond to an employer penalty TIP because the consequences of not doing so are severe. Under an employee TIP, employees will merely gain less from an increment of wages, and may not be very responsive to the TIP incentive effect.

Nevertheless, an employee TIP should be a useful complement to an employer penalty TIP. In the discussion of income distribution, it will be suggested that if the decline in price inflation does not match the decline in wage inflation (contrary to theory and econometric evidence), employees might be compensated for their wage restraint. Such compensation could be naturally integrated with an employee TIP if it were in effect. Under the employee TIP, the tax cut or surcharge for employees of each firm would already be computed. Compensation could be implemented by raising the tax cut for employees and reducing the surcharge on them at each firm, perhaps by adjusting the income tax withholding rate, as suggested earlier. An employee TIP would therefore facilitate the implementation of compensatory tax rebates to protect labor under TIP.

The Welfare Economics of TIP

Two aspects of the welfare economics of TIP are considered: its impact on allocative efficiency and on income distribution. Both have important implications for the design of tax-based incomes policies.

ALLOCATIVE EFFICIENCY

As has been argued above, the institutional features and ethical norms of modern labor markets and the income-maintenance programs of the welfare state have had the socially undesirable effect of raising the NAIRU above the social optimum; but these deviations from a classical, atomistic labor market have also had socially desirable consequences. Imagine an unorganized labor market in which workers compete individually with one another for jobs in intense, atomistic rivalry. Unconstrained by ethical norms, employers encourage this competition among individual workers and do not hesitate to replace an employed worker with an unemployed rival who will accept a lower wage. Moreover, there are no income-maintenance programs. The consequence of prolonged unemployment is catastrophic.

In such an economy, the NAIRU would be significantly lower than that of the current economy. Each worker would weigh the wage offered against the value of leisure or job search, and offer to work as long as the former exceeded the latter. The equilibrium unemployment rate, or NAIRU, would be optimal with respect to allocative efficiency (the trade-off of work versus leisure-search).

Many economists, including me, believe that the development of trade unions, ethical constraints on employers, and income-maintenance programs on the whole have significantly advanced social welfare, even though they impair allocative efficiency and convey a distorted signal of the work versus leisure-search preference of individual workers. From this perspective, the appropriate response is to investigate whether or not policy can be designed to reduce the NAIRU while preserving the positive contributions of existing institutions.

From a microeconomic perspective, the problem is that the average individual firm grants a larger wage increase, at any given unemployment rate, than is optimal. The standard microeconomic approach to this externality would be to charge each firm for raising the NAIRU through its "excessive" wage increase. A TIP would attempt to do this. It would add one new incentive, but would not eliminate the market forces that continue to shape relative wage and price patterns and help guide resources efficiently.

An example will illustrate TIP's impact on relative wage and price

patterns. Suppose that firm A had a labor shortage because demand for its product was increasing, while firm B (equal in size to firm A) had a labor surplus because demand for its product was declining. Without TIP, at the excessive NAIRU suppose A granted a 10 percent wage increase, and B, 6 percent, so that the average was 8 percent. If TIP were introduced with an interim target of 6 percent, A might grant 7 percent, and B, 5 percent, so that the average would be reduced to 6 percent. Ultimately, when the permanent inflation and unemployment targets are achieved, A might grant 3 percent, and B, 1 percent, so that the average would be 2 percent. Because TIP would not influence labor shortage and surplus and would leave each firm free to make its own decisions, basic relative wage and price patterns should still emerge.

The objective of preserving the allocative function of relative wage changes does, however, tend to limit the size of the TIP multiplier m and hence the extent to which the NAIRU can be lowered. There is a social cost to a high m. Raising m not only reduces the average wage increase, but also reduces the variance around it, thereby impeding the allocative function of relative wage changes.

Consider three alternative tax schedules for an employer penalty-reward TIP (with a target of 2 percent) and for the NAIRU that each would hypothetically achieve:

Schedule	t_i (*percent*)	*NAIRU* (*percent*)
1	$48 + 0(w_i - 2)$	6
2	$48 + 5(w_i - 2)$	4
3	$48 + 10(w_i - 2)$	3

If the unemployment rate were at the NAIRU, an illustrative dispersion of w_i between the firms might be:

Schedule	*Firm A, shortage* (*percent*)	*Firm B, surplus* (*percent*)
1	4	0
2	3	1
3	2½	1½

Under schedule 1, in effect without TIP, the firm's tax rate is uniformly 48 percent. Under schedule 2, however, the firm's tax rate would rise to 58 percent if it gave a wage increase of 4 percent, and would fall to 38 percent if it gave 0 percent. As a result, the optimum wage increase for firm A should be less than 4 percent, say, 3 percent; the wage increase for firm B should be greater than 0 percent, say, 1 percent. Under sched-

ule 3, the firm's tax rate would be higher than under schedule 2 at each w_i above 2 percent, and lower at each w_i below 2 percent; and the dispersion of wage increases between A and B would be even more compressed.

In the extreme case, if m is large, no firm can afford to give more than 2 percent; and employees would not tolerate less than 2 percent because the reduced corporate income tax under a penalty TIP would give management a large increase in net profit. This case is virtually equivalent to uniform wage control at 2 percent. A key advantage of TIP over wage controls is that the market forces that shape relative wage patterns would continue to operate automatically, provided that m is not too large. But a large m overwhelms these forces and approaches uniform wage control. Thus, there is a trade-off.

The cost of a large m lies in slowing the speed with which the equilibrium pattern of relative wage levels required for efficient allocation is attained. The more compressed the distribution of wage changes, the longer it takes to reach the desired pattern of wage levels. Similarly, TIP should somewhat slow the speed of adjustment of the relative size of two industries, like A and B in the example above, by reducing the retained earnings with which A may finance its expansion. Thus, more time will be required for the desired ratio of capital stocks to be attained for the two industries. It should be emphasized, however, that once the new relative wage is achieved, the tax rates will again be equalized. The cost of a larger m is therefore the reduced speed of adjustment, not a permanent misallocation of resources.

The case for TIP rests on the plausible assumption that neither an m of zero (in effect, no TIP), nor a large m (in effect, uniform wage control) is socially optimal; but rather, some intermediate m will best promote social welfare, optimally balancing the gains of a lower NAIRU against the loss from slower responses to market forces.

Concern for allocative efficiency has a number of important implications for the design of TIP. First, TIP should be fully continuous, rather than discontinuous. Under a fully continuous TIP, any increment of wages would raise the tax rate, and any decrement would reduce it. In contrast, under the completely discontinuous, all-or-none TIP, unless the firm can go all the way to the target, there is no incentive to go part way. Moreover, once the target is reached, there is no incentive to go further. It is likely that only firms close to the target will slow wage increases

under such a TIP, and thus the incentive will be less effective on the average and will cause a greater distortion of relative wages. By similar reasoning, a partly continuous TIP is less desirable than a fully continuous one.

Second, allocative efficiency would be affected by the coverage of TIP. If the pattern of relative wages and prices were allocatively efficient without TIP, then to minimize the distortion of this pattern, TIP should exert comparable downward pressure on all wage increases. This would argue for broad coverage. However, if the pattern of wages were regarded as distorted without TIP, excluding from TIP small firms with low wages might improve allocative efficiency, as well as holding down administrative cost and improving equity.

Allocative efficiency would call for inclusion of large firms in the public and nonprofit sectors as well as in the private profit sector. The feasibility of such inclusion should therefore be carefully investigated. For example, federal general revenue sharing to state and local governmental units might be varied inversely with the size of the wage increase.

Third, the method of measuring the wage increase may affect allocative efficiency. Perhaps the most straightforward method of computing the average wage level at any firm would be to divide total compensation by total man-hours. As Wallich and Weintraub recognized in their original article, this method would enable a firm to reduce its average wage (and hence reduce its TIP penalty) by shifting its labor skill mix from high-wage to low-wage workers. However, the incentive may not be strong. The firm must weigh a one-time tax gain (in the year of the shift) against a permanent distortion in its labor skill mix. If the firm maintained the new skill mix in subsequent years, it would receive no further TIP benefit. If it shifted back to the original skill mix, it would incur a TIP loss, subsequently offsetting its initial TIP gain.

Furthermore, some shift in the composition of labor demand toward low-skilled workers may be socially desirable. An argument can be made that the wages of these workers relative to those who are highly skilled are too high for allocative efficiency because concern for equity tends to narrow the wage differential.[17] The result is an excess supply of low-skilled workers at the same time as there is a shortage of high-skilled workers. Employment programs for low-skilled persons try to induce employers to shift their skill mix. From this perspective, it is possible that the in-

17. J. R. Hicks, "Economic Foundation of Wage Policy," *Economic Journal,* vol. 65 (September 1955), pp. 389–404.

centive to shift the mix of workers under TIP could improve, rather than harm, allocative efficiency.[18]

If further analysis indicates that excessive shifting is likely, one method to contain it would be to use a weighted wage index such as that suggested by Wallich and Weintraub.[19] Recently, Weintraub has suggested an alternative approach of corrected-average-product.[20] As this example illustrates, implications of the method of measuring the wage increase for allocative efficiency require further investigation.

Another aspect of allocative efficiency that warrants study is the issue of whether TIP will induce the substitution of labor for capital, and of debt for equity, because the tax penalty is levied on the accounting profit of the firm, which includes returns to equity capital. Only if a firm expects to grant above-average wage increases would it have an incentive to reduce its equity capital. Under a penalty-reward TIP, a firm that expects to grant below-average wage increases would have an incentive to increase its equity capital. If a firm chose its capital-labor and debt-equity ratios based on long-run considerations, it may be unaffected if it assumes that a penalty-reward TIP will not affect its average tax rate over the planning period. In contrast, a penalty-only TIP would be expected to raise the average tax rate (assuming the base rate remains constant) and would therefore presumably reduce equity capital. It appears likely, therefore, that a penalty-reward TIP would be less harmful to allocative efficiency in this respect than a penalty-only TIP. Concern for allocative efficiency therefore calls for both penalty and reward.

In general, analysis should attempt to go beyond the detection of a possible distortion from TIP to an estimate of its magnitude. Is the distortion of a penalty-reward TIP likely to be large relative to the benefits of such a policy? This assessment should be an important task for future research.

INCOME DISTRIBUTION

Because TIP provides an incentive to reduce wage increases, it is sometimes suggested that it will shift the distribution of income from labor to capital. As long as TIP does not alter the growth rate of the markup of

18. Laurence S. Seidman, *The Design of Federal Employment Programs* (Lexington, 1975), pp. 77–146.

19. Wallich and Weintraub, "Tax-Based Incomes Policy."

20. Weintraub, *Capitalism's Inflation and Unemployment Crisis,* p. 128.

price over standard unit labor cost (k), however, the decline in wage inflation caused by TIP will be matched (perhaps after a short lag) by an equal decline in price inflation. There is no obvious reason why TIP should alter k, though this warrants careful study.

On the other hand, TIP would not "freeze" the distribution of income shares. As noted earlier, if k were nonzero, the distribution of income would change gradually over time. For example, suppose that the degree of competition in the economy increases over time, so that k is slightly negative. The share of labor income in national income will then have an upward secular trend. If TIP does not affect this negative value of k, it would not alter the secular trend in labor's share.

Even though there is no obvious reason why TIP should reduce labor's share of income, wage earners and their union representatives may remain concerned that the reduction in price inflation will not match the reduction in wage inflation. Although a tax incentive for price restraint is administratively infeasible, two methods of protecting labor appear feasible and deserve careful consideration. They are set forth in the concluding section below.

Conclusions and Recommendations

This paper presents an analysis of alternative tax-based incomes policies. To summarize, a TIP is a tax penalty, a reward, or a combination of both that provides an incentive to the employer or employees at each firm to reduce the firm's own wage increase. The microeconomic impact of TIP is analyzed in a value-maximization model and in a collective bargaining model. A macromodel consistent with the micromodel is then used to analyze the impact on the macroeconomy.

A central conclusion is that a permanent TIP should permanently reduce the NAIRU of the economy. Rather than considering TIP as a policy that seeks to reduce the inflation rate permanently, even in the presence of excessive monetary growth, TIP should be viewed as a policy that attempts to reduce permanently the unemployment rate at which the inflation rate will remain constant. The proper average growth rate of the money supply would be required, over the longer run, to achieve an average inflation rate near zero.[21] Thus, TIP is fully compatible with a flexible

21. It might well be desirable to vary the money supply growth rate around its average for countercyclical purposes.

monetary view of inflation. At the same time, the wage view of inflation, which holds that prices closely follow unit labor costs, is a key element of the macromodel.

The case has been made that the current NAIRU is above the social optimum and is economically inefficient. The institutional features and ethical norms of modern labor markets and the income-maintenance programs of the welfare state have raised the NAIRU so that, when the unemployment rate is at the NAIRU, the value of leisure or job search to the marginal unemployed worker is significantly less than the value of his marginal product. Thus, policy should attempt to reduce the NAIRU while preserving the benefits of modern labor markets and the welfare state.

A distinctive feature of TIP is that it attempts to reduce the NAIRU by a method that seeks to maintain the influence of market forces on relative wages and prices, thereby minimizing the reduction in allocative efficiency and preserving decentralized wage and price decisionmaking. It therefore appears likely that the benefit of reducing the NAIRU by this method will exceed the cost in allocative efficiency.

A major objective of this paper is to compare alternative TIPs and to provide guidance for design. An important implication of the microanalysis is that a continuous, penalty-reward employer TIP, implemented through the income tax of the firm, appears most likely to succeed. In particular, the penalty is essential to assure a high probability of effectiveness. A reward-only employer TIP is likely to be weaker and less reliable. An employee TIP is not likely to be an effective substitute for an employer TIP. An employee TIP, however, implemented through the withholding system at each firm, should reinforce the impact of an employer TIP and therefore be a useful complement to it. Allocative efficiency is impaired least if both employer and employee TIPs are fully continuous, so that any reduction in the wage increase reduces the penalty or increases the reward.

The following design for TIP is consistent with the conclusions of the analysis. It combines elements from the Wallich-Weintraub employer TIP and the Okun employer-employee incentive package. Currently the U.S. average annual wage increase is 8 percent; the average trend growth rate in labor productivity is 2 percent; and the basic inflation rate is 6 percent. Suppose that TIP set as its interim targets a wage inflation rate of 6 percent and a price inflation rate of 4 percent. Then the TIP might

consist of the following two incentives. The first is an employer incentive, in which a firm that granted a wage increase in excess of 6 percent would receive a surcharge on its income tax for that year in proportion to the size of the excess. If it granted less than 6 percent, it would receive a proportionate tax cut; if it granted 6 percent, its tax rate would remain at the base (currently 48 percent for many corporations). The second is an employee incentive. Employees at a firm that granted an average wage increase in excess of 6 percent would receive a tax increase for that year in proportion to the size of the excess. If the firm granted less than 6 percent, the employees would receive a proportionate tax cut; if it granted 6 percent, their tax rate would remain at the base. The penalty or reward would depend only on the *average* wage increase at the firm so that individual promotions would not be discouraged.

The employee incentive could be implemented through the income tax withholding system, and the reward or penalty would be reflected in the actual withholding rate and in take-home pay, as described above.

Concern for both allocative efficiency and equity implies that coverage should be as broad as administrative and compliance costs permit. Small firms, however, should have the option of inclusion in both, or exclusion from both. If feasible, the equivalent of TIP should be applied to the nonprofit sector and to state and local governments (for example, by varying general revenue sharing inversely with the size of the wage increase).

For both incentives, the tax surcharge for exceeding 6 percent must be significant but not prohibitive, so that when market forces warrant a relative wage increase, the firm will still find it worthwhile to exceed 6 percent, though by less than it would have without TIP. For example, two firms that might have granted 10 percent and 6 percent, respectively, without TIP might grant 7 percent and 5 percent with it.

Because TIP is an unprecedented incentive, there is no reliable method for initially estimating the size of the penalty or reward required to achieve the interim target of 6 percent. Two kinds of information, however, should be useful in choosing the initial size of the employer TIP. First, data on the distribution of wage increases across firms should be examined. For example, given the current mean of 8 percent, what percentage lies between 6 percent and 10 percent, or 4 percent and 12 percent? Does the dispersion vary with the size of firms? Second, data on the distribution of profit rates across firms and fluctuations in profit rates for individual firms

over time should be examined. Once again, do the dispersion and fluctuation vary with the size of firms? Together, these two kinds of data should help suggest the size of the penalty that would cause a significant, but bearable, temporary decline in the after-tax profit rate for firms that choose to be in the upper end of the distribution of wage increases. Once the initial sizes for both the employer and the employee TIP have been determined and put into effect and the actual response of firms observed, the sizes could be adjusted appropriately.

If these incentives, together with proper monetary and fiscal policies, succeed in reducing wage inflation to 6 percent and price inflation to 4 percent, the dividing line between the penalty and reward should be gradually reduced (over several years) to 2 percent, the average growth rate of labor productivity. As disinflation steadily occurs, the unemployment rate can gradually be brought down to the new lower NAIRU. With a permanent TIP exerting permanent downward pressure on wage increases, it should be possible to keep wage inflation steady at close to 2 percent and price inflation near 0 percent if the unemployment rate is kept equal to the new NAIRU. Experience with TIP will tell whether a NAIRU of perhaps 4 percent could be achieved with a TIP penalty that is sufficiently moderate to allow relative wages and prices to respond to market forces and guide resources efficiently.

To maintain the new NAIRU and price stability, the growth rate of the money supply prescribed by monetarists would then be essential, on average. Periodic disturbances will continue to move the economy away from its targets, and countercyclical policy will be necessary to counter these disturbances. Nevertheless, a permanent TIP should reduce the frequency and degree of stagflation in the economy.

Finally, TIP should have no significant impact on the secular trend in the distribution of income between labor and capital. Although TIP is applied only to wage increases, price inflation should decline as much as wage inflation. This conclusion does not depend on an assumption of perfect competition, but only on the assumption that TIP will not alter the degree of competition, or market power, in the economy.

Nevertheless, there are at least two methods of guaranteeing protection for labor under TIP that appear feasible and deserve serious consideration. Under "real wage insurance," suggested by Arthur Okun, if the wage target is met but the price target is not, a compensatory tax rebate can be

provided to wage and salary workers.[22] My suggestion would be to link the tax rebate to an employee TIP, so that the tax cut is greatest for employees who exercise greatest restraint. A key aspect of the proposal is that the contingent compensatory tax cut must be authorized in advance, when TIP itself is enacted, so that protection is guaranteed. In addition, the rebate could be paid if wage inflation declined more than price inflation, even if the wage target were not met.

Under the second proposal, suggested by Lawrence Klein and Vijaya Duggal, if the wage target were met but the ratio of after-tax profits to labor income rose above some threshold for the entire corporate sector (or economy), the base corporate tax rate would be raised equally for all firms to keep the ratio for the corporate sector below the threshold for that year.[23] The threshold should reflect both the secular trend and the cyclical behavior of the ratio. Once again, a key aspect is that the corporate tax rate adjustment should be enacted in advance, so that protection is guaranteed.

Other feasible methods may be developed to assure that the distribution of after-tax income does not shift unfairly because of TIP. A tax-based incomes policy, together with such complementary policies, promises significant benefits for labor, business, and the public, and therefore deserves serious consideration.

APPENDIX

The Myopic Profit-Maximization Model and the Value-Maximization Model

THIS APPENDIX presents the mathematics of the myopic profit-maximization model and the value-maximization model, which are described verbally in the text. In both, the firm is assumed to be a monopsonistic competitor in its labor market, facing an upward-sloping labor supply

22. See Arthur Okun, "Incomes Inflation and the Policy Alternatives," in "The Economists' Conference on Inflation: Report," vol. 1 (1974; processed), pp. 365–75.

23. Lawrence R. Klein and Vijaya Duggal, "Guidelines in Economic Stabilization: A New Consideration," *Wharton Quarterly*, vol. 6 (Summer 1971), pp. 20–24.

curve, and a monopolistic competitor in its product market, facing a downward-sloping product demand curve. It is assumed that current gross (before-tax) profit is a function of w, the percentage wage increase (given the wage of the previous period, the choice of the wage of the current period can be described as the choice of the percentage wage increase of the current period); and that the function has the following properties:

$$\pi^G = \pi^G(w,\delta), \tag{A-1}$$

where δ is a product demand parameter. Terms that are not defined in this appendix are defined in the text.

$$\frac{\partial \pi^G}{\partial w}(w',\delta) = 0, \tag{A-2}$$

$$\frac{\partial^2 \pi^G}{\partial w^2} < 0. \tag{A-3}$$

From A-2 and A-3, w' is the wage increase that maximizes gross profit, as shown in the diagram.

The myopic profit-maximization model is as follows.

Without TIP, management chooses the w that maximizes current net (after-tax) profit according to the following:

$$\pi^N(w) = (1 - b)\pi^G(w), \tag{A-4}$$

$$\frac{\partial \pi^N}{\partial w} = (1 - b)\frac{\partial \pi^G}{\partial w} = 0. \tag{A-5}$$

A-5 follows from A-4 because without TIP, the tax rate b does not depend on w. Management will therefore choose the w' that satisfies A-2, as shown in the diagram.

If a continuous employer TIP were introduced, the tax rate t would be:

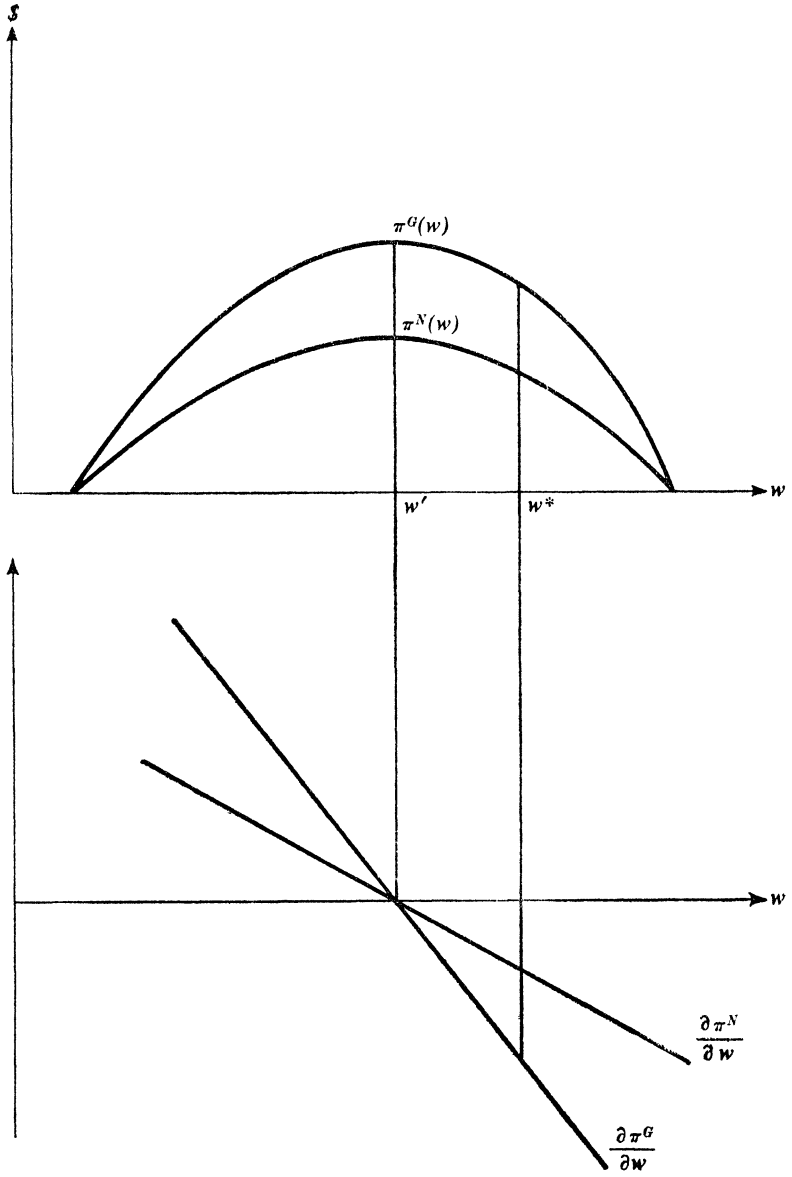
$$t(w) = B + mw. \tag{A-6}$$

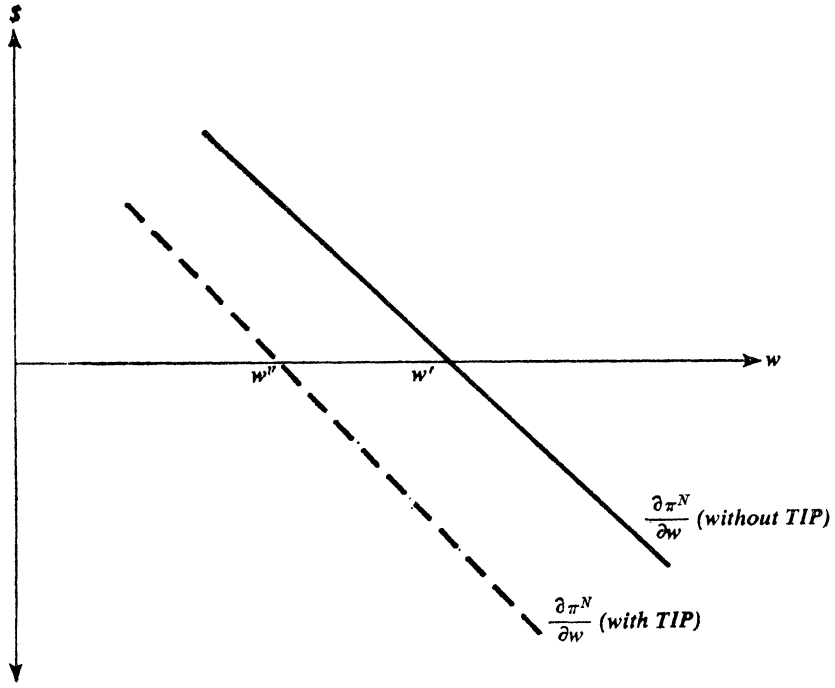
A-5 is therefore modified as follows:

$$\frac{\partial \pi^N}{\partial w} = (1 - t)\frac{\partial \pi^G}{\partial w} - \pi^G \cdot m = 0. \tag{A-5a}$$

The difference between A-5a and A-5 is the change in $\partial \pi^N / \partial w$ due to TIP, and is called the TIP incentive effect:

$$\left(\frac{\partial \pi^N}{\partial w}\right)_{TIP} - \left(\frac{\partial \pi^N}{\partial w}\right)_{No\ TIP} = (b - t)\frac{\partial \pi^G}{\partial w} - \pi^G \cdot m. \tag{A-7}$$


$
$\pi^G(w)$
$\pi^N(w)$
w
w'
w^*
w
$\frac{\partial \pi^N}{\partial w}$
$\frac{\partial \pi^G}{\partial w}$



At w' the optimum without TIP, using A-2, A-5a becomes:

$$\text{(A-8)} \qquad \left(\frac{\partial \pi^N}{\partial w}(w')\right)_{TIP} = -\pi^G(w')\cdot m < 0, \qquad \pi^G(w') > 0.$$

The value of $\partial \pi^N/\partial w$ at w' measures the incentive provided by TIP—penalty or reward—to reduce w below w'. It depends on m—the TIP marginal tax penalty—and on $\pi^G(w')$; but not on $\pi^N(w')$. Because $\partial \pi^N/\partial w$ is negative at w', management chooses $w'' < w'$ to satisfy A-5a, as shown in the diagram presented above. But it also chooses a smaller volume of employment because it always optimizes at wage-employment combinations on its (positively sloped) labor supply curve.

The value-maximization model is as follows:

$$\text{(A-9)} \qquad V = V(\pi^N, I),$$

where

V = the value of the firm (present value of current and future net profit), or the value of the income stream of management

I = investment in personnel policy.

(A-10) $$I = I(w), \qquad dI/dw > 0.$$

It should be noted that because I is defined as a function solely of w, it is independent of π^N.

The value function is assumed to have these properties:

(A-11) $$\frac{\partial V}{\partial \pi^N} > 0, \qquad \frac{\partial V}{\partial I} > 0,$$

(A-12) $$\frac{\partial V/\partial \pi^N}{\partial V/\partial I} \equiv \frac{dI}{d\pi^N}\bigg|_{V=constant} \equiv MRS > 0.$$

The MRS between personnel investment and current net profit is therefore positive as defined here (the negative of the slope of the iso-value curve).

(A-13) $$\frac{\partial MRS}{\partial \pi^N} < 0.$$

A-13 is the income, or profit squeeze, effect. When π^N declines, the impact of a specific decrement in I on V can be offset with a smaller increment in π^N. For A-13 to hold, the elasticity of the numerator of A-12 with respect to π^N must be less (more negative) than the elasticity of the denominator. This is shown as follows. Substituting A-12 into A-13 using the quotient rule yields:

(A-14) $$\frac{\partial V}{\partial I}\frac{\partial(\partial V/\partial \pi^N)}{\partial \pi^N} - \frac{\partial V}{\partial \pi^N}\frac{\partial V/\partial I}{\partial \pi^N} < 0.$$

Dividing by $(\partial V/\partial I) \cdot (\partial V/\partial \pi^N)$ and multiplying by π^N yields:

(A-15) $$E_{\pi N} < E_I,$$

where

$E_{\pi N}$ = the elasticity of the numerator of A-12 with respect to net profit

E_I = the elasticity of the denominator of A-12 with respect to net profit.

(A-16) $$E_{\pi N} \equiv \frac{\partial(\partial V/\partial \pi^N)}{\partial \pi^N} \cdot \frac{\pi^N}{\partial V/\partial \pi^N},$$

(A-17) $$E_I \equiv \frac{\partial(\partial V/\partial I)}{\partial \pi^N} \cdot \frac{\pi^N}{\partial V/\partial I}.$$

The more negative is $\partial(\partial V/\partial \pi^N)/\partial \pi^N$ in A-16, the more likely it is that A-15 and therefore A-13 will hold. For example, if $\partial(\partial V/\partial I)/\partial \pi^N$ in A-17 were zero, establishing that $\partial(\partial V/\partial \pi^N)/\partial \pi^N$ was negative would be sufficient to establish A-15 and therefore A-13. The discussion in the text concerning the cost of capital when V is the value of the firm and the signals of managerial competence when V is the value of management's own income stream provides rationales for why $\partial(\partial V/\partial \pi^N)/\partial \pi^N$ should be significantly negative, thereby increasing the probability that A-13 holds.

Management chooses w^* such that:

$$\text{(A-18)} \qquad \frac{\partial V}{\partial w} = \frac{\partial V}{\partial \pi^N}\frac{\partial \pi^N}{\partial w} + \frac{\partial V}{\partial I}\frac{dI}{dw} = 0.$$

Dividing through by $\partial V/\partial I$ yields:

$$\text{(A-19)} \qquad MRS \cdot \frac{\partial \pi^N}{\partial w} + \frac{dI}{dw} = 0.$$

Thus, at the optimal w^*, because both the MRS and dI/dw are positive, $\partial \pi^N/\partial w$ must be negative (not zero, as it is in the myopic model), as shown in the first diagram in this appendix. It is important to note that management does not choose w^* instead of a smaller wage increase because it seeks to attract a larger volume of employment and produce more output; it chooses w^* to invest in personnel policy. Thus, the firm will choose a wage-employment combination above (to the left of) its labor supply curve. A reduction in w below w^*, therefore, need not reduce employment.

Consider a particular $\pi^G(w,\delta)$ function such that when δ decreases, $\partial \pi^G/\partial w$ and $\partial \pi^N/\partial w$ are unaltered at each w. At the lower δ in A-19, $\partial \pi^N/\partial w$ and dI/dw are unaltered at w^*, but MRS is greater because $\pi^N(w^*)$ is less (from A-13). Because the left side of A-19 is now negative at w^*, $\partial V/\partial w$ at w^* is negative in A-18. It would therefore be optimal for management to reduce w below w^* in response to the decrease in δ. This contrasts with the myopic model, in which such a decrease in δ would not alter the optimal w (it would remain w' according to A-2).

The impact of TIP on A-19 is as follows. Under a penalty TIP, $t(w^*)$ is greater than b; because $\pi^G(w^*)$ is assumed to be unaltered, $\pi^N(w^*)$ declines. From A-13, the MRS term in A-19 increases. Because $\partial \pi^N/\partial w$ is negative at w^*, this increase in the MRS tends to make the left side of

A-19 negative, and thus $\partial V/\partial w$ negative at w^*. In contrast, under a reward TIP, $t(w^*)$ is less than or equal to b, so that the *MRS* stays constant or decreases, instead of increasing. The impact of a penalty TIP, in contrast to a reward TIP, on the *MRS* term is the profit-squeeze, or income effect. It is because a penalty TIP should raise the *MRS*, while a reward TIP should not, that it is probable that a penalty TIP will make $\partial V/\partial w$ more negative at w^*, and therefore provide a stronger incentive to reduce w below w^*.

Both a penalty and a reward TIP affect $\partial\pi^N/\partial w$ at w*, according to A-7. For a penalty TIP and a reward TIP with the same m, the second term in A-7 is identical at w^* and tends to reduce $\partial\pi^N/\partial w$ (making it more negative, thereby raising its absolute value). For a penalty TIP, b is less than $t(w^*)$, and because $\partial\pi^G/\partial w$ is negative, the first term is positive, partly offsetting the second term. For a reward TIP, the first term is either zero or negative, reinforcing the second term. Thus, the TIP incentive effect is actually somewhat greater for a reward TIP than it is for a penalty TIP at w^* because of the first term in A-7. Intuitively, the lower tax rate at w^* under a reward TIP causes the increment in π^N to be greater for a given decrement in w.

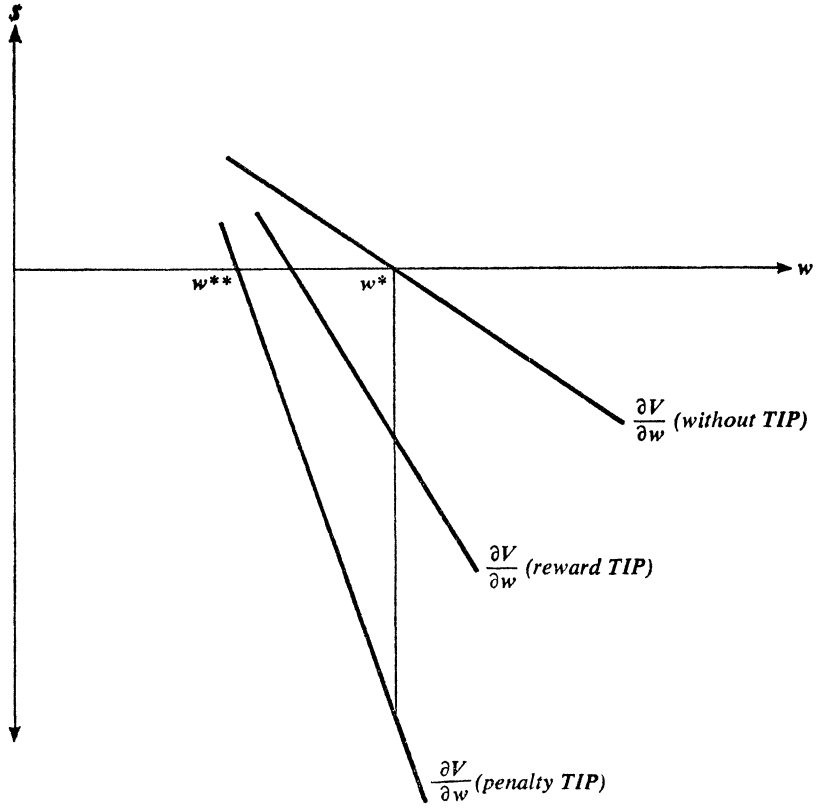
The intuition behind the value-maximization model, however, is that the differential impact on the *MRS* due to the profit-squeeze, or income effect, outweighs the differential substitution effect. If so, a penalty TIP would provide a stronger incentive at w^* to reduce w, as shown in the diagram below. Moreover, because the firm was operating above its labor supply curve prior to TIP, the lower w does not require a reduction in employment.

Under a penalty TIP, management chooses w^{**} less than w^* to satisfy A-19. It will now be shown that the TIP multiplier m can be set such that w^{**} will equal the TIP target n so that in A-20, $t(w^{**})$ equals b:

$$t(w) = b + m(w - n), \qquad n < w^*. \tag{A-20}$$

If m can be so set, then a penalty TIP would reduce w below w^* without causing an actual increase in the tax rate, or an actual net profit squeeze at w^{**}.

If w equal to n is to be the new optimum, w^{**}, it must satisfy A-19 under TIP. Without TIP, at w equal to n the left side of A-19 would have been positive, since it was optimal to raise w to w^*. At w equal to n, TIP would not affect two of the three components of A-19, *MRS* and



dI/dw. $MRS(n)$ is unaffected by TIP, regardless of the value of m because $t(n)$ equals b for all m, so that $\pi^N(n)$ is independent of m. The only component of A-19 that varies with m is $\partial\pi^N/\partial w$, according to the expression for $\partial\pi^N/\partial w$ given in A-5a. At w equal to n, $\partial(\partial\pi^N/\partial w)/\partial m$ equals $-\pi^G(n)$, so that $\partial\pi^N/\partial w$ varies linearly with m; any negative value of $\partial\pi^N/\partial w$ can be attained by raising m sufficiently.

The m required to make w equals n the new optimum under a penalty TIP is obtained as follows. First, solve A-19 for the required value of $\partial\pi^N/\partial w$ at w equals n, given $MRS(n)$ and dI/dw at n, which are both independent of m. Then the required value of m can be obtained by setting the expression for $\partial\pi^N/\partial w$ in A-5a equal to the required value of $\partial\pi^N/\partial w$, and solving for m, given t equal to b, $\partial\pi^G/\partial w$ at n, and $\pi^G(n)$.

The new optimum, w^{**} equal to n, is sustained solely by the TIP incentive effect—the change in $\partial\pi^N/\partial w$ at n—because a penalty TIP would

not alter $MRS(n)$ or dI/dw at n. Thus, if m is set so that A-19 is satisfied at w equal to n, although a net profit squeeze would be threatened at w^*, none would occur at the w^{**} equal to n that results.

This contrasts with an increase in the ordinary income tax rate b. By raising the MRS term in A-19, this would reduce w below w^*. At the new optimum, however, the tax rate would still be higher, because b does not vary with w, and an actual net profit squeeze is required to sustain the new optimum.

Comments and Discussion

Robert J. Gordon: Laurence Seidman has presented a comprehensive and provocative analysis that attempts to persuade the reader that adoption of an employer TIP will reduce the natural (equilibrium) unemployment rate and, aided by an accommodative monetary deceleration, will slow inflation to a rate of less than 1.0 percent in a relatively short time. Along the way, Seidman argues that an employer TIP is to be preferred to an employee TIP. Although he claims that a penalty-based employer scheme is a more potent tool for wage deceleration than a reward-based plan, he nevertheless endorses a continuous flat-rate, tax-reward schedule applying both above and below the short-term wage guideline. Seidman's cursory review of allocative and distribution effects reveals no drawbacks sufficiently important to weaken his support of an employer TIP.

Several issues raised in the paper apply not only to TIP, but equally to any supply shift—whether a positive shift caused by a crop failure, a payroll-tax increase that raises the price at which firms are willing to supply a given output, a negative shift caused by bumper crops, or a successful TIP that reduces that price. First, for a given growth rate of nominal income, a supply shift changes the division of that spending between growth in real output and price increases. Bumper crops or a successful TIP would make possible, for any given growth rate of nominal income, a simultaneous reduction in the rate of inflation and increase in growth of real output. This, in turn, would allow the Federal Reserve to decelerate the rate of monetary growth without causing a recession or higher unemployment. In general, any government-induced price-reducing supply shift—whether in the form of price controls, TIP, or a reduction in payroll or excise taxes—creates an environment in which monetary deceleration is encouraged and, therefore, the administration and Congress indirectly "gain control" over monetary policy.

The principal sources of inertia in the U.S. inflation process, which make inflation so difficult to decelerate and cause monetary tightness to be translated into higher unemployment rather than a slowdown in inflation, are the institutions of three-year overlapping wage contracts in the unionized part of the economy and pattern-setting and emulation in much of the remainder of the economy. Before reading Seidman's paper, I found it difficult to understand the workings of an employer TIP that imposes a tax increase on firms, including those that are locked into existing wage contracts and those that have committed themselves to a given increase in wages over the following year. I doubted that such a program could reduce the inflation rate except by creating a crisis of business confidence and by increasing the amount of slack in the economy. Unfortunately there is nothing in Seidman's paper to allay my suspicion that the short-run impact of an employer TIP may be perverse.

While Seidman includes a collective-bargaining model, his primary analytical focus is on nonunion wage determination where the firm sets its own wage increase unilaterally to maximize its own net profit or utility. This is an important shortcoming of the paper. More convincing is the analytical framework in Rees' paper at this conference, which views the rate of wage change as the outcome of a clash between the differing interests of firms and workers, with a reconciliation brought about in many cases by strikes or by the threat of strikes. Seidman's myopic profit-maximizing model, in which TIP tilts the net profit schedule, presents a one-sided wage decision, not a two-sided wage bargain. Many firms cannot limit the wage increase to that which maximizes net profit because they face the threat of strikes as workers try to maximize their own utility. As Rees points out, TIP may increase the likelihood of strikes as employer pressure for small wage increases stands against the desires of workers, who have no such tax incentive to settle for less.

Seidman's second, value-maximizing model makes the size of wage increases depend on the size of employer net profits. Thus, the empirical tests of the effect of net profits on wage behavior in U.S. time series data form an important part of Seidman's case for an employer TIP. If Seidman is right, the squeeze on net profits caused by higher corporate taxes levied on firms through an employer TIP will lead to lower wage settlements as workers react to the profit squeeze. If Seidman is wrong, and net profits have no such effect on wage behavior, an equally plausible sce-

Table 1. Coefficients on Detrended Net Profits in Alternative Wage Equations

Sample description	*Dependent variable*[a]	
	Average hourly earnings (*1*)	*Compensation per man-hour* (*2*)
Period 1955:2–1975:2		
1. Seidman specification	0.0103	0.0177
	(2.29)	(2.06)
2. Lagged wage replaced with lagged price	0.0011	0.0094
	(0.22)	(1.13)
Period 1954:1–1976:4		
3. Seidman specification	0.0029	0.0067
	(0.75)	(0.92)
4. Lagged wage replaced with lagged price	−0.0067	0.0026
	(−1.65)	(0.39)
5. Social security tax, personal income tax, minimum wage, and control dummy variables added to 3, using lagged wage	−0.0073	0.0007
	(−1.33)	(0.07)
6. Same as 5, using lagged price	−0.0152	−0.0061
	(−2.68)	(−0.60)

Sources: Bureau of Labor Statistics and author's estimates.
a. Sum of coefficients on detrended ratio of net profits to corporate product. Numbers in parentheses are t statistics. The dependent variable is in the form of a one-quarter rate of change.

nario is that firms will attempt to shift forward the burden of the higher corporate taxes in the form of price increases.

For the purposes of discussion, I have prepared table 1, which presents the coefficient on net profits (measured as the detrended ratio of corporate profits after tax to gross corporate product) in a number of different wage equations. Column 1 presents results for equations in which the quarterly change in the average hourly earnings index of the Bureau of Labor Statistics is the dependent variable, and column 2 presents results in which the dependent variable is the quarterly change in compensation per man-hour.

Only in the first line, for both wage variables in columns 1 and 2, is the coefficient on net profits significantly positive. In all other variants of the wage equations the coefficient on net profits is either insignificant or significantly negative. In line 2, Seidman's sample period is retained, but his lagged wage-change variable is replaced by lagged price changes. In line

3, the sample period is extended slightly; in line 4, the lagged wage is again replaced by the lagged price. In lines 5 and 6 additional independent variables are included that have proved to be important in my recent research on wage behavior, including changes in the effective social security tax rate, the effective personal income tax rate, the effective minimum wage, and dummy variables for the period of price and wage controls in the early 1970s.

Thus, Seidman's empirical conclusion that a net profit squeeze contributes to a wage deceleration does not appear to be robust. On the other hand, in experiments that add a corporate tax variable to a price equation, there is no conclusive evidence supporting forward shifting of the corporate tax. Although my empirical results do not suggest that an employer TIP will have any beneficial income effect to reinforce its substitution effect, there is no strong case to be made that it will have an adverse income effect.

While I am skeptical that an employer TIP will have a beneficial impact, I am more sympathetic to the idea of an employee TIP. As Seidman points out, an employee penalty creates conflicting income and substitution effects, with the possibility that the loss of income caused by a tax penalty may lead to higher rather than lower wage demands. But this cannot be an argument for favoring an employer TIP because the same possibility of an adverse income effect exists for an employer tempted to shift forward the tax penalty to recoup lost net profits. Instead, the major weakness of the employee TIP is the problem raised earlier of inertia due to multiyear wage contracts and pattern setting. Equity problems arise when TIP penalties are levied on unions that are locked into prenegotiated contracts that call for wage increases at rates higher than the TIP guideline.

Because Seidman ignores the inertia phenomenon, his numerical simulations of the effect of TIP are overly optimistic. Policymakers following Seidman would be likely to set the TIP no-penalty guideline too low initially, ignoring the large number of workers who would receive wage increases exceeding the guideline and who would thus pay a penalty (directly in an employee TIP or indirectly in the case of an employer TIP). If policymakers are surprised by TIP's lack of effectiveness, they will be equally stunned by a substantial increase of tax revenue that will have a deflationary effect on the economy. Thus, far from achieving a simultaneous reduction in inflation and unemployment as assumed by

Seidman, TIP could actually have the opposite effect and increase unemployment.

Finally, Seidman is entirely too sanguine about the lack of impact of a wage-only TIP on the income distribution, due to the alleged lock-step correlation between prices and wages. My past work has indicated that price change responds to wage change with a substantial lag. The short-run impact of a wage deceleration would be to limit labor's share of the income distribution. The wage deceleration of the early 1960s in response to slack labor markets, together with wage guidelines, helps to explain why the share of profits in the gross national product was so high in 1964 and 1965. And the British experience with voluntary incomes policy in the past few years has indicated that prices follow wages with a lag sufficiently long to cause a squeeze on labor's share that lasts for a year or more. Because labor unions are familiar with this historical experience, they are likely to fight hard against the adoption of a TIP scheme that applies only to wages.

Arthur M. Okun: Laurence Seidman provides much microeconomic and macroeconomic insight into the way alternative TIP plans could work. I agree with most of his analysis, but I have some important reservations and so I would like to summarize his argument, indicating where I see things differently.

As a point of departure, Seidman considers a representative nonunion firm facing a standard maximization problem with respect to its labor market. Operating in a search labor market, it faces a positively sloped supply curve of labor and has some wage discretion. When a penalty TIP —an extra tax on the wage increase—is imposed, the firm finds it optimal to settle for a smaller wage increment. But in those circumstances, a penalty TIP simply moves the firm to the left on the supply curve of labor facing it. The firm, as a result, opts for a lower level of employment as well as a lower wage rate. Also implied are a lower level of output and a forward shifting of the TIP penalty into product prices. In that world, TIP is not distinctly disinflationary; it is contractionary.

To justify an employer TIP, Seidman must leave that world and include "employee satisfaction" as a consideration in the firm's value maximization, which adjusts the short-term measured profit of the firm by adding the present value of its incremental personnel investment. The point is that, even though the firm obtains enough workers when it holds

down its wage, it may sacrifice valuable morale, which may mean lower current productivity or higher future quit rates. Any firm for which personnel investment is important will operate off its labor supply curve in a weak labor market. And therefore when it is induced by a penalty TIP to hold down wages, it does not cut employment. Moreover, so long as the firm can expand output by hiring one more available applicant at the same wage, the last unit of output that was a zero-profit unit before TIP incurs no extra tax and remains a zero-profit unit after the introduction of TIP. And hence there is no reason to expect a forward shifting of the TIP penalty; lower wage hikes mean lower price hikes. Hence, the employer TIP is distinctly disinflationary and not contractionary in that world.

I fully share Seidman's view that the value-maximization model is the right model for the world we live in. Unlike the myopic model, it explains why firms allow quit rates to fall in a slack labor market without slowing or cutting wages, and why firms raise their wages even when applicants are abundant at the existing wage. Indeed, any time a nonunion firm raises its wage when it has layoffs or a no-help-wanted sign, it must be deliberately operating inside (to the left of) its short-run labor supply curve. Clearly, most firms during a slump consciously "over-pay" labor relative to the wage required merely to evoke the number of workers they want.

Seidman stresses another and quite separate implication of the model, namely, the role of high profits in stimulating wage increases. He invokes a diminishing marginal rate of substitution between currently measured profits and present value of incremental personnel investment. His intuition on that score seems plausible to me: capital markets cannot fully appraise the value of the personnel investment; and when current profits are very low, the value of long-run investments in personnel or anything else becomes questionable. That implies that the higher the level of current profits, the more the firm should focus on its long-run investment in personnel, and hence the higher the wage it should be willing to pay, other things being equal.

Seidman stresses this point as one rationale for preferring a penalty TIP to a reward TIP on wages. But actually it is an argument for a higher tax rate on corporate income. That higher rate comes back to haunt Seidman when he conjectures quite plausibly that some firms may do

their pricing on the basis of after-tax returns and, in that case, would pass through the TIP surcharge into higher prices. Of course, a penalty TIP need not entail a higher average corporate tax rate: one could estimate the likely TIP revenues, lower the basic corporate rate, and thus keep total expected revenues constant. In that case, the favorable "income effect" on wages is lost, but the danger of forward shifting of the corporate tax is avoided. Because of his strong emphasis on the income effect, Seidman would not make that trade. As a matter of judgment, it looks like a good trade to me.

While the TIP surcharge will not enter into the marginal cost of output for any firm with excess job applicants, it does have a flaw previously noted by Richard Slitor. It imposes different marginal incentive effects on firms with a high ratio of profits to wages as compared to firms with a low ratio, reflecting either differences in labor intensity or profitability of their capital. As Slitor suggests, *that* defect can be avoided by depriving firms of full deductibility of their payrolls as expenses if they exceed the hurdle wage increase in a penalty TIP. But Slitor's alternative places the entire penalty into the marginal cost of output, and that would be an even more serious defect in my judgment. Ideally, any deductibility penalty should be based on the employment of *last year* so that increased employment would not enlarge the penalty. But that clearly creates greater administrative complexity.

When Seidman develops the macroeconomics of the TIP system, he describes briefly the way TIP could be used to disinflate an economy that had reached its nonaccelerating-inflation rate of unemployment (NAIRU) with a high inflation rate. The TIP and the adjustments of monetary growth can lower the inflation rate without incurring the enormous output losses that Perry underlines in his paper. Seidman stresses in greater detail that TIP can lower the NAIRU, backing his claim with an ingenious juggling act of adjusting the TIP penalty and monetary growth to neutralize the first-round effect of each successive movement into territory that would otherwise accelerate the inflation rate.

Of the two predicted consequences of TIP, disinflating at a given NAIRU and lowering NAIRU, I feel more enthusiastic about the former. The interest in TIP and other cures for stagflation that created this conference was triggered by the stubbornness of the inflation rate at high unemployment rates. The second part of the story—lowering NAIRU

through TIP—works in any plausible model of the NAIRU type. Seidman has convinced me that he is right in principle. But any substantial shift might require a very costly reward or a penalty so high that it would be nearly prohibitive, like controls. The nonlinearity of the short-term Phillips curve points to this danger. Furthermore, the markup of prices over wages may become significantly wider at high utilization rates; then, the TIP incentive must be strong enough to push down (and keep holding down) real wages to lower the NAIRU. The emphasis on disinflation points to TIP as a transitional remedy, while the emphasis on lowering NAIRU frames it as permanent. Operationally, however, I submit that this is a red herring. Any advocate of TIP should ask the Congress to recognize TIP as experimental and to legislate it for a trial period of a few years.

Let me conclude with a few comments on reward and penalty variants of TIP. For policy purposes, one should simply forget the logical possibility that Seidman records of giving rewards to employers for especially small wage increases and imposing penalties on workers based on the average wage increase paid by their firms. Such proposals would fail any reasonable test of equity in the political process. Henry Wallich has articulately defended the evenhandedness of his proposal by emphasizing that the penalty is on the *employer,* even though the tax is on excessive wage increases. Penalizing workers or rewarding firms on wages would remove any semblance of evenhandedness. Wage penalties must be imposed on firms, and wage rewards must be given (and made universally available) to workers.

Seidman loads the dice against the reward approach in a number of ways. The most obvious example of that is his use of the assumption that any worker accepting a wage-restraint reward would expect an equivalently lower (before-tax) wage level for the remainder of his career with a firm. I find that entire analysis totally unpersuasive. It claims that workers will shift to jobs that offer lower current take-home pay on the conviction that the before-tax level of wages is the best predictor of future after-tax wages. Workers must be more sensible than that! Furthermore, Seidman ignores two advantages of rewards—that they cannot raise marginal costs and that they avoid the forward shifting and labor-intensity problem. Finally, he does not take seriously the evidence of a lag from wages to prices stressed by Robert Gordon, which implies that during its

first year a penalty-TIP would redistribute income from wages to profits. A reward-TIP would compensate for that on an after-tax basis.

Laurence Seidman: Gordon's profit variable gives mixed results in alternative wage equations, in contrast to the highly significant performance of my profit variable in table 1. His profit variable does obtain a t statistic just above two in a wage equation with the same right-hand variables that I used ("Seidman specification"), though his t value is less than mine (just above four). The performance of Gordon's profit variable generally deteriorates as he varies the specification of the wage equation.

Part of the contrast may result from the fact that Gordon and I test different profit variables. If this is correct, then it becomes important to assess the theoretical plausibility of each profit variable.

My variable is the ratio of the after-tax profit rate on equity in manufacturing to its trend value. It focuses on the detrended level of after-tax profit relative to stockholders' equity. The choice of this profit variable rests on the hypothesis that it is the rate of return on equity (relative to the rate regarded as "normal") that is important to a board of directors and stockholders, and therefore to management. The profit rate on equity is a widely quoted measure of the performance both of a firm and of its management. In a collective bargaining context, the union may also focus on it as the best indicator of the firm's "ability to pay."

Gordon's variable is the detrended ratio of the share of after-tax profits in value added for the entire corporate sector. The numerator is the rate of after-tax profits to gross product originating (value added). It is not clear to me why a board of directors or stockholders, and therefore management, should be concerned about the ratio of after-tax profits to value added, rather than to equity. Even unions may be more interested in rates of return on equity.

In sum, a fair test of the role of profits in wage determination requires a theoretically plausible profit variable and the specification of the wage equation. Gordon's mixed results underline the need for further research. They do not, however, change my current view that the profit rate on equity relative to trend appears to influence wage inflation; or my conclusion that econometric evidence appears to provide some support for the belief that an employer penalty TIP is likely to provide a stronger and more reliable incentive than an employer reward-only TIP.

General Discussion

Several discussants were concerned about the allocative consequences of the TIP plan. Martin Baily mentioned distortions that could be introduced by uniform across-the-board guidelines. Recognizing the administrative problems, he nonetheless saw the need for flexible rules and special exceptions that would take account of differing supply and demand conditions among industries. Bruce MacLaury suggested that some variation across firms might be permitted by gearing the penalty on excessive wage increases to a firm's historical performance on wages over several years rather than to a uniform percentage guideline on wage increases.

Frederic Mishkin suggested that Seidman's scheme might punish rapidly expanding firms unduly, because he thought they would be likely to have above-average rates of wage increase. James Tobin said that firms would still be free to grow rapidly and to pay higher relative wages under a TIP plan; if they chose to do so, they would simply have to pay higher taxes for a limited period during which they raised their relative wage. Edmund Phelps was concerned that, if the penalty was only a one-time tax on a permanent move to a higher wage level, as Tobin implied, the TIP penalty might not be an effective incentive to hold wages down. George von Furstenberg saw other implications of the one-time character of the penalty. For example, it treated rapidly growing firms least unfavorably if they raised their relative wage most when they were small and thus still had small profits subject to the penalty tax rate.

Michael Wachter stressed the importance of the internal labor market that firms use for promotions and upgrading; he thought that any TIP plan might distort the workings of that market and thus cause a serious inefficiency. Thomas Juster was concerned that, under TIP, unmeasured fringe benefits—including loafing on the job—would become more attractive. Sidney Weintraub was not persuaded that some of these predicted changes would occur to any significant degree, or that all of them would necessarily be distortions if they did occur. In any case, he emphasized, it was worthwhile accepting some microeconomic allocative inefficiency to correct the massive allocative inefficiency of unemployed resources.

Robert Hall contended that Seidman's externality argument assumed that the social cost of inflation was huge. That was a fundamental issue

that was not clearly demonstrated by theory or empirical evidence. James Duesenberry countered that, although the costs of inflation may not be clear, it was clear that the costs of attempting to reduce inflation through restraint of aggregate demand were extremely large.

Duesenberry suggested that, to be effective, a TIP plan had to supplement a basic consensus in which the majority of citizens committed themselves to reduce inflation through a cooperative effort. Under those circumstances, which are required for any incomes policy, a penalty TIP would help by punishing the minority of holdouts and by coordinating the actions of those in the consensus. Michael Wachter commented that a minority of holdouts might undermine the effectiveness of any plan. He expected many holdouts, especially among people who felt that their incomes had lagged behind and that they therefore deserved an opportunity to catch up.

In line with Duesenberry's view of a penalty TIP as a "convincer," Arnold Packer suggested more generally that the line between persuasion, on the one hand, and TIP, on the other, was not so sharp as Seidman implied. People in social situations generally respond to persuasion and unenforced rules. The effectiveness of rewards and penalties under TIP would depend on whether or not people accept the reasonableness of the system and expect others to do so, too.

Another portion of the discussion examined the short-run and long-run potentialities of tax-based incomes policy. Was it to be viewed mainly as a device to effect a transition to a lower inflation rate or as one to lower the nonaccelerating-inflation rate of unemployment (NAIRU) permanently? Wachter was unpersuaded by Seidman's argument that the NAIRU would be actually reduced. He did not see how TIP would reduce the size of the pool of unemployed required to keep labor markets in balance. Wachter thought such a shift had to involve some change in relative wage patterns (including the relative return from wages and transfer payments) or some improvement in the efficiency of labor markets. Basically, the issue required a general equilibrium analysis, which Seidman had not provided. Similarly, Benjamin Friedman questioned how TIP could have a beneficial transitional effect without lowering the natural rate of unemployment. In response, Arthur Okun pointed to the explicit assumption in Seidman's model that the ratio of prices to standard unit labor costs was not raised by high utilization rates. That assumption could be crucial to the possibility of lowering NAIRU signifi-

cantly with a penalty of reasonable size. But it was not crucial to the transitional benefits.

Franco Modigliani felt strongly that any TIP should be terminated as soon as the inflation rate wound down, even if the program in fact was capable of lowering the natural rate of unemployment. He feared that a permanent TIP would have serious distorting effects. On the other hand, Phelps argued that, since the natural rate of unemployment was not necessarily socially optimal, a permanent tax to lower it might well be justified on efficiency grounds. Seidman urged Modigliani to weigh the permanent gains from a lower natural unemployment rate against any permanent distortionary costs. Weintraub commented that both the analysis in Seidman's paper and the discussion of it by the participants leaned heavily on the natural-rate view—an equilibrium concept that Weintraub felt had little relevance.

Albert Rees agreed and extended Gordon's reservation about the modeling of TIP in the context of a nonunion employer maximizing an objective function. Collective bargaining would be the dominant mode of wage determination for the class of firms that would be covered by a penalty TIP plan. Rees felt that the original Wallich-Weintraub paper, although less elegant than Seidman's, had presented a preferable model that allowed them to come to grips with wage determination among large firms and unions. Weintraub expressed another reservation about the single-firm microeconomic analysis; he thought that the general increase in the money wage should be viewed as determined by the whole system rather than by the functions of a single representative firm.

Particular issues about the design of a TIP plan evoked some comments. Martin Feldstein supported the view that, because TIP was experimental, it should be regarded as temporary; hence he preferred penalties to rewards because it was much less difficult politically to terminate a penalty. John Shoven felt that the corporate tax rate was a poor instrument for a penalty TIP designed to moderate wage increases because ratios of total wages to profits differ so widely among firms. The punishments for large wage increases would depend on those ratios and would not correspond to the seriousness of the violation.

George von Furstenberg noted the possibility of a perverse effect on prices from a penalty TIP on wages. For a monopolistic firm engaged in short-run profit maximization and facing an upward-sloping labor supply schedule, the marginal profit would fall to zero at a lower output level.

Under these conditions, the TIP penalty would curtail the supply of output and thus actually raise prices. He noted that Okun had made a similar point in his comments, and that Seidman had conceded it in the paper. Unlike them, however, he was not ready to dismiss that model as irrelevant.

Some participants probed the distributional impact of Seidman's TIP plan. Weintraub doubted that any shift to profits would be quantitatively significant, even in the initial year of the program. A small shift might be acceptable, particularly if the program included some type of excess profits tax. Seidman elaborated on his specific proposals for insuring fairness to workers. Duesenberry suggested that a penalty TIP might be made more equitable and more acceptable to workers by simultaneously enacting a cut in income or payroll taxes that directly benefited wage and salary earners.