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Macroeconomic Implications of Profit Sharing

Introduction

My point of departure is the idea that standard macroeconomic policy may not always be enough to create full employment with price stability. In a capitalist economy, most decisions about employment, output, and prices are made by private firms. Of course such decisions are profoundly influenced by government macroeconomic policies, yet the purposeful manipulation of financial aggregates may be a clumsy way of attaining desirable macroeconomic goals. Under certain circumstances the best place to attack macroeconomic problems may be directly at their source. Make it in the strong self-interest of firms to maintain full employment with low prices, and macroeconomic problems might, to a greater extent than now, largely take care of themselves. To be sure, control of government spending, the "money supply," tax receipts, and the like will always have an important role in influencing how the economy behaves. But perhaps the time has come to think seriously about basic reform of microeconomic incentives as a kind of alternative, or at least complementary, approach.

While macroeconomic theory is currently in a state of great controversy, most economists still agree that mainstream IS-LM policies can be used as a crude rudder for aiming the economy in one direction or the other. Illusions of being able to fine-tune aside, we know how to get unemployment down and output up by the usual expansionary monetary and fiscal measures. We also know how to break inflation by policy-induced recessions. What we do *not* know—and this is the central economic dilemma of our time—is how *simultaneously* to reconcile reasonably full employment with reasonable price stability.

At this point the honest Keynesian puts in the awkward if obligatory footnote about the need for some form of incomes policy. But this phrase

is usually added rather mechanically, as an afterthought, with little enthusiasm or follow-up. I think it may be time to reverse the emphasis. In countries like Britain and France (or, for that matter, Argentina and Israel) today, the main operational issue is how to introduce greater wage restraint and "flexibility" into the labor market, especially as it starts to become tight. Compared with this issue the nuances of how best to reflate the economy are relatively straightforward. Although the dilemma being described is currently seen most starkly in some European economies, the same basic issues are involved almost everywhere. Things have reached a point where a surprising number of macroeconomists of Keynesian or classical persuasion have essentially abandoned the hope that traditional macroeconomic policies can do a great deal to promote prosperity. I would argue, as a general proposition, that structural changes should be a relatively more pressing concern than the demand management policies currently occupying the attention of most macroeconomists.

The plan of the article is as follows. First, I attempt to place the problem of labor payment mechanisms in historical perspective. Then I provide an analytic framework for comparing wage and profit-sharing systems, including a detailed description of the relevant theoretical and empirical aspects of profit sharing. Major criticisms of profit sharing are discussed in a question-and-answer format. Next, I try to assess critically what I see as three major alternative prototypes for structural reform of the labor market: incomes policy, two-tiered pay, and employee control. I argue that, although each may reduce unemployment, profit sharing is overall the most likely to succeed. I then examine the Japanese experience with an eye to evaluating the possible macroeconomic impact of the bonus system and implications for profit or revenue sharing. The article concludes by again stressing that basic reforms in the way labor is paid could be a precondition to improved macroeconomic performance.

The Historical Context

Before discussing possible labor market reforms, I think it useful to place my main subject in a somewhat broader context by reviewing the intellectual history of the problem. Such a review is necessarily prone to being interpretive and subjective.

The modern mainstream approach to macroeconomics began with Keynes. Previous economists by no means disregarded business cycles—the subject has a long history. But the prevailing attitude before Keynes was that economic fluctuations represent a normal, and sometimes even desirable, condition. Classical macroeconomics held (and still holds) that

all markets are practically competitive and practically always in equilib-
rium. The old-fashioned classical macroeconomics admitted that the
economy might not always be in equilibrium due to "temporary derange-
ment of markets" (Mill) or "crises of confidence" (Marshall). Old classical
macroeconomists also felt some obligation to explain how an economy
out of equilibrium gets back into equilibrium (as opposed to tautologi-
cally postulating that an economy must always be in some kind of mar-
ket-clearing equilibrium). But such states of disequilibrium were not
viewed as terribly important in the overall scheme of things.

The Great Depression dealt a death blow to classical macroeconomics
of the old school. There was no lack of contemporary explanations for
the depression, but none of them sounded convincing. Most damning of
all in the eyes of the public, few economists had any constructive sug-
gestions about what to do to correct the worst economic catastrophe in
history. Hayek and Haberler talked of abstract Austrian-capital building
cycles. Schumpeter found depression a necessary, if distasteful, medi-
cine for sweating out inefficiencies. Perhaps the most common interpre-
tation among economists—certainly the one most aggressively targeted
for attack by Keynes—was that of A. C. Pigou.

Pigou, along with a possible majority of economists at the time, held
that the wage issue was central. If labor was unemployed, what else
could it mean except that wages were too high? As Pigou, the distin-
guished economist of world stature, Keynes's teacher, and the foremost
representative of the prevailing orthodoxy put it in 1933, at the very bot-
tom of the worst depression in history: "Such unemployment as exists at
any time is due wholly to the fact that changes in demand conditions are
continually taking place and that frictional resistances prevent the ap-
propriate wage adjustments from being made instantaneously"[1]. If
workers were unemployed, it meant that labor costs were too high and
there was nothing the government could, or should, do, aside from pos-
sibly urging that wages be cut more vigorously.

Keynes was quick to seize on two serious problems with the Pigouvian
position. For one thing, it was not exactly clear what it meant for wages
to be "too high" in a depression. "Too high" relative to what? Presum-
ably wages were "too high" relative to the state of aggregate demand,
properly defined. But that must mean the same thing as aggregate de-
mand being "too low" relative to wages. Furthermore, it was far from
clear how the "too high" wages could be lowered. Even if labor wanted
to cooperate by reducing money wages to restore full employment,
would not universal wage cutting lead primarily to further price cut-

1. See Pigou (1933), p. 252.

ting—which would leave the real economic situation nearly unchanged? The practical moral of this dilemma was clear enough to Keynes, who was not the type to ponder long over theoretical paradoxes when actual solutions were close at hand. As a purely practical matter, discretionary fiscal and monetary policy represented a far more pragmatic approach to attacking unemployment than any conceivable series of wage reductions. And this remained true with or without the afterthought of Pigou's real balance effect to rescue the concept of a full-employment equilibrium attainable by flexible wages. Thus was born one of the greatest disappearing acts in history. Like a fantastic magician, Keynes removed the malfunctioning labor market and the wage issue from right before the public's eyes and replaced it by discretionary government policy to manage aggregate demand via the skillful manipulation of financial aggregates.

The rest is history. The Keynesian approach of actively manipulating financial aggregates to improve macroeconomic performance became virtually synonymous with macroeconomics and, rightly or wrongly, was credited with the quarter-century of strong stable economic growth that followed World War II. When, after an initial period of success, activist Keynesian policies for spending ourselves into full employment were blamed, rightly or wrongly, for the double-digit inflation of the 1970s, the stage was set for the monetarist version of which particular financial aggregates should be manipulated—how, when, and by whom. The basic message of monetarism is that if the economy concentrates on achieving price stability by rigidly controlling the "supply of money," at worst there may be a few awkward transition years when slightly less ambitious targets for full employment will have to be accepted. But when the system finally settles down at a stable low rate of inflation, steady slow growth of the "money supply" will yield no more unemployment over the long run than discretionary Keynesian interventionism. Unfortunately, as many central banks have had to learn the hard way, in a monetary technology that includes plastic and electronic money tied to deregulated banks and financial institutions, the "quantity of money" is not a terribly operational concept. More to the point, the deep policy-induced recession of 1981–83, which yielded the highest unemployment rates since the Great Depression, is widely viewed, rightly or wrongly, as discrediting simple-minded monetarism. Monetarism, it appears, does not eliminate the stagflation dilemma.

Where do we go from here? Most of the advanced capitalist economies (except Japan), after experimenting with Keynesianism and monetarism, are obviously in trouble on stagflation. Since the problem originates in wage behavior, that is the logical place to look for a solution.

From this perspective, the major macroeconomic problems of our day go back, ultimately, to the wage system of paying labor. We try to award every employed worker a nominally predetermined piece of the income pie before it is out of the oven, before the size of the pie is even known. Our "social contract" promises workers a fixed nominal wage independent of the health of their company, while the company chooses the employment level. This stabilizes the money income of whoever is hired, but only at the considerable cost of loading unemployment on low-seniority workers and inflation on everybody—a socially inferior risk-sharing arrangement that both diminishes and makes more variable the real income of workers as a whole. The individual worker who is promised a fixed number of pieces of green paper may feel secure, but it is an illusion from a social standpoint because, when all workers are so promised, a difficult burden of adjustment has been placed on simultaneously maintaining full employment while preserving what the pieces of green paper can buy.

In my opinion it is time to focus more directly on the labor market itself, to build in automatic flexibility and to reform out structural rigidities so that we do not have to rely quite so exclusively on macroeconomic sledgehammer "cures" to maintain noninflationary full employment. What is required is institutional change in incentive structures on the micro level to make it in employers' strong self-interest automatically to react to unfavorable shocks by maintaining high levels of employment while lowering prices rather than the other way around.

Profit Sharing

The reason profit sharing has more favorable macroeconomic consequences than a wage system is quite simple. Suppose the firm controls the employment decision. Then, other things being equal, under a profit-sharing system the firm is more inclined to expand employment and output in the face of shocks than under the corresponding wage system.

The following example illustrates the basic point. Suppose the typical firm can produce output Y out of labor L by the production function $F(L)$. Let the firm's revenue function be $R(Y)$. If the firm pays a fixed wage w it will hire labor and produce output at the level where profits $R(F(L)) - wL$ are being maximized, or where the marginal revenue product of labor $R'F'$ equals the wage w.

Now imagine, as a kind of thought experiment, that a profit-sharing system is put in place promising to pay each worker a base wage ω and a share λ of gross profits per capita. Each worker is now paid $W = \omega +$

$\lambda\Pi/L$, where $\Pi = R(L) - \omega L$ represents the gross profits of the firm, before profit-sharing bonuses are paid. The firm's net profits are now $\pi = (1 - \lambda)(R(F(L)) - \omega L)$, and the net marginal value of an extra worker is $(1 - \lambda)(R'F' - \omega)$. Provided only that $\omega < w$, the firm will wish to expand output and employment from its previous position. No matter how one interprets the "other things being equal" in this comparative statics thought experiment, a profit-sharing system is more expansionary than a wage system. If pay parameters are set so that workers are initially paid the same amount immediately after conversion from a wage into a profit-sharing system, the firm will wish to expand employment and output, thereby contracting its price (and pay) compared with the previous situation. If pay parameters are set so that, after the firm's reaction to the introduction of a profit-sharing contract, each worker ends up being paid the same as under the previous wage contract, then output and employment must be higher, with prices lower. The expansionary effects are stronger the smaller is the base wage ω, irrespective of the profit-sharing coefficient λ.

There is a simple explanation of all this. When factor costs are lowered, a profit-maximizing monopolist will want to hire more input, produce more output, and charge a lower price. When faced with a pure profits tax, on the other hand, the monopolist will choose to hire the same amount of input, produce the same output, and charge the same price. So far as the monopolist is concerned, conversion from a wage system to a profit-sharing system (with a smaller base wage) is equivalent to lower factor costs coupled with a pure profits tax. Hence the expansionary bias of a profit-sharing system over a wage system.

At some risk of oversimplification, let me give a concrete if highly idealized (and extreme) example of what I have in mind. Suppose that wages plus fringe benefits of the average General Motors automobile worker come to $24 per hour. This means that the cost to GM of hiring one additional hour of labor is $24. The extra hour of labor is used to produce more automobiles, which are then sold to yield increased revenue. If the increased revenue exceeds the increased cost, more workers will be hired; in the opposite case, workers will be laid off. Since GM is trying to maximize profits, it will take on (or lay off) workers to the point where the additional revenue created by the extra hour of labor is neither more nor less than the additional cost, in this case $24. The average revenue per hour of labor will naturally be higher, say $36, to cover overhead, capital, profits, and the like.

Now imagine that the auto workers agree to a different type of contract with GM. Instead of a fixed wage of $24 an hour, they go for a fixed two-thirds share of GM's average revenue of $36. At first glance there seems

to be no difference between the two systems, since in both cases the workers get $24 an hour. However, GM's incentive to hire or fire is subtly but dramatically changed.

If GM now hires an extra worker, its revenue goes up by $24 as before, but its total labor cost in fact only increases by two-thirds of $24, or $16. It clears a profit of $8 on the extra worker, and understandably wants to go on hiring and expanding output more or less indefinitely. There is a secondary effect: in order to sell the extra output, GM has to reduce the price of its cars relative to other auto makers.

The benefits for the whole economy are thus clear: the new labor contract means more output and jobs—and lower prices. Firms want to hire more workers for the same reason they would be keen to acquire more salesmen on commission—nothing to lose, and something to gain.

So what is the rub? Clearly the revenue per worker—and therefore pay—has declined because the marginal revenue brought in by the extra worker is less than the average revenue. Senior workers who are not unduly at risk of being laid off might resist the plan.

However, this conclusion does not necessarily follow if a large number of important firms introduce profit (or revenue) sharing, because as each firm expands and hires more workers, total workers' purchasing power rises, and so does the demand for GM's products. Not for the first time, the sum of the economic parts adds up to more than the parts themselves. The conclusions reached from this example readily generalize to formulas encompassing more realistic "mixed" systems of base money wages plus shares of per capita profit (or revenue).

Somewhat more abstractly, consider a typical monopolistically competitive firm in a partial equilibrium setting. Suppose the wage is treated as a quasi-fixed parameter in the short run. If the firm can hire as much labor as it wants, it will employ workers to the point where the marginal revenue product of labor equals the wage rate. This is familiar enough. Consider, though, what happens with a profit-sharing contract that names a base wage and a certain fraction of profits per worker to be paid to each worker. Suppose these two pay parameters are treated as quasi-fixed in the short run. A little reflection will reveal that if the profit-sharing firm can hire as much labor as it wants, it will employ workers to the point where the marginal revenue product of labor equals the base wage, independent of the value of the profit-sharing parameter. (Note, though, that what the worker is actually paid depends very much on the value of the profit-sharing coefficient.) When a standard IS-LM type macro-model is constructed around such a model of the firm, the following isomorphism emerges. A profit-sharing macroeconomy will find itself with the same output, employment, and price level as the corre-

sponding wage economy whose wage is set at the profit-sharing economy's base wage level. In other words, the aggregate macroeconomic characteristics of a profit-sharing economy, excepting the distribution of income, are determined (on the cost side) by its base wage alone. The profit-sharing parameter does not influence output, employment, or prices, although it does influence the distribution of income. If the employed workers can be persuaded to take more of their income in the form of profit shares and less in the form of base wages, that can result in a Pareto improvement—with increased aggregate output and employment, lower prices, and higher real pay.

For concreteness, let the aggregate demand specification be

$$Y = \alpha A + \beta M/P,$$

where Y is real national product, A is aggregate autonomous real spending, M is the money supply, and P is the price level. Coefficients α and β represent the relevant fiscal and monetary multipliers.

The aggregate demand equation is an underdetermined system. Given A and M (and the parameters α and β), there is an extra degree of freedom between the two major macroeconomic variables Y and P. The Keynesian tradition essentially fixes the price level P in the short run, implicitly relying on a more or less constant markup over sticky wages. Suppose, again for concreteness, that the economy consists of a large number n of symmetric monopolistically competitive firms, each of which produces output y from labor l according to the identical (linear) production function

$$y = \gamma(l - f),$$

where γ is the marginal productivity of an extra worker and f represents a fixed amount of overhead labor that must be employed to produce any output at all[2]. Each firm faces the (isoelastic) demand curve

$$y = (p/P)^{-E}(Y/n)$$

as a function of the price p it charges and the relevant aggregate demand variables. Then

$$\mu = E/(E - 1)$$

2. This production function can be viewed as a first-order approximation in the relevant operating range. That unit variable costs are roughly constant over some range is, I think, a decent enough stylized fact to be used as a point of departure for the purposes of this article.

is the markup coefficient for each firm, representing the ratio of its average revenue (price) to marginal revenue.

In the short run, suppose each firm pays its l workers by the profit-sharing formula

$$W(l) = \omega + \lambda(R(l) - \omega l)/l,$$

where $R(l)$ stands for total revenue as a function of labor, given the relevant demand and production functions. The pay parameters ω, representing the base wage, and λ, representing the profit-sharing coefficient, are both treated in the short run as exogenously fixed. A wage system here is just a special case of a profit-sharing system with the share coefficient $\lambda = 0$.

When l workers are hired by the firm, total net profits are

$$\pi(l) = (1 - \lambda)(R(l) - \omega l).$$

If unlimited amounts of labor are available to be hired on the given share contract, the firm will choose to hire workers to the point where

$$R'(l) = \omega.$$

But the marginal revenue product of labor with isoelastic demand curve and linear production function is related to price charged, p, by the formula

$$R'(l) = \gamma p/\mu.$$

Combining the above two expressions, with unlimited supplies of labor available on the quasi-fixed pay contract, each firm would choose to set its price at the level

$$P' = \mu\omega/\gamma.$$

The corresponding desired or target aggregate output level of the profit-sharing system with fixed pay parameters (ω,λ), denoted Y', would then be, from the aggregate demand specification,

$$Y' = \alpha A + \beta M\gamma/\mu\omega.$$

The strictly hypothetical variable Y' measures what firms would like to produce in the aggregate on the given pay contract if there were no over-

all labor constraint. Let the actual full employment output level of the economy be Y^*. Real aggregate production Y must then be the smaller of the demand-determined target Y' and the supply-determined capacity Y^*, i.e.,

$$Y = \min \{Y', Y^*\}.$$

The price corresponding to the full employment case $Y = Y^*$ is, from the aggregate demand specification,

$$P^* = \beta M / (Y^* - \alpha A).$$

We have thus derived a complete theoretical description of the short-run behavior of the macroeconomic variables (Y, P) as a function of the quasi-fixed parameters α, β, A, M, ω, λ. To recapitulate the methodology, each firm makes its short-run pricing, output, and employment decisions to maximize profits given the rigid labor payment parameters, the state of aggregate demand, and the prices that all the other firms are charging. The economy's short-run behavior is modeled as the Nash equilibrium outcome of this individualistic profit-maximizing process, which simultaneously satisfies the basic macroeconomic aggregate demand condition.

The economy in the regime $Y' < Y^*$ exhibits textbook Keynesian behavior in the short run when pay parameters can be treated as quasi-fixed. The price level P' cannot be directly affected by government policy. But output Y' responds via the standard Keynesian multipliers to changes in autonomous real spending A or money supply M.

By contrast, when $Y' > Y^*$ the economy displays classical or monetarist characteristics in a short run where pay parameters are quasi-fixed. Government aggregate demand management has no influence on real output, already at full employment, but directly influences the price level. Monetary policy is strictly neutral, with prices directly proportional to M. Expansionary fiscal policy has only an inflationary impact, since it crowds out private spending.

An immediately striking result is that the share parameter λ does not affect real national product or the price level (although it does affect real pay and the distribution of income). Only the value of ω, representing to a firm the "hard" money cost of taking on an extra worker (as opposed to the "soft" cost of a share of incremental gross profits), influences the overall level of national income. If workers in a wage economy agree to receive 80 percent of their pay in the form of base wages and 20 percent in the form of a profit-sharing bonus, the effect on national product, em-

ployment, and prices is "as if" wages had been cut by 20 percent while aggregate demand (real autonomous spending and the money supply) was being maintained at the same level.[3]

When a wage economy ($\lambda = 0$) suffering from unemployment converts to a profit-sharing formula whose parameters are initially set so that each employed worker is at first paid the same amount, the change will make all workers better off after the economy adjusts. Real pay in a profit-sharing system is

$$W/P = (1 - \lambda)\omega/P + \lambda y/L.$$

After conversion from a wage system to an "equivalent" profit-sharing system initially yielding the same pay, the share economy firms are induced to expand output and employment while lowering price. If labor productivity Y/L is not countercyclical, real pay must increase. In addition, new jobs have been created, so there are more employed workers, each of whom is receiving higher real pay. In this sense a seemingly neutral move toward profit sharing represents an unambiguous improvement for the working class.

Note that the argument applies only when a sufficiently large number of firms of a wage economy simultaneously convert to profit-sharing plans. If one firm alone converts, and if it attempts to hire new workers, it will only be at the expense of driving down the pay of its original workers. So coordination may be required to induce people to convert to a share system: one possibility is to have the government reward profit-sharing workers, by preferential tax treatment of share income, for their part in creating the positive externality of a tight labor market.

Consider next a longer-run situation where the set-up is the same as before except that pay parameters are now endogenously determined. For simplicity I will treat the base case of perfect competition in the labor market. The interested reader can consult a more complicated formulation of an imperfectly competitive labor market where it is shown that the same conclusions hold a fortiori.[4] I should point out that I view the hypothesis of competitive equilibrium in the labor market not as a literal description but more as a long-term approximation or norm that is never actually attained, yet forms a useful basis for talking about possible departures from normalcy.

In a wage economy ($\lambda = 0$), under thorough-going competition where each firm is free to set its own wage rate and does so to maximize

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3. The reader will note that this conclusion holds under much more general conditions than the specific model being treated here.
4. See Weitzman (1986), forthcoming.

profits taking as given the prevailing level of pay throughout the economy, the limiting Nash equilibrium behavior as each firm becomes a negligible buyer of labor yields the full employment wage

$$w^* = \beta M\gamma/\mu(Y^* - \alpha A).$$

The next question is what happens when $\lambda > 0$. The basic concept of competitive equilibrium in the labor market is essentially the same for a share system as for a wage system. Given the pay parameters every other firm is selecting, each firm is free to choose its own pay parameters but must live with the consequences of labor shortage if it selects values that are too low. The underlying solution concept is a symmetric Nash equilibrium in pay parameters, which means that if all firms are selecting (ω,λ) as parameter values, it is not profitable for any one firm to deviate from that pattern.

A basic theoretical result is that any pair (ω,λ) constitutes a long-run competitive equilibrium in pay parameters if and only if it delivers to each worker the same pay as the equilibrium wage system $(w^*, 0)$ operating under otherwise identical circumstances. There is thus an inverse relationship between long-run equilibrium values of λ and ω and, hence, one extra degree of freedom in determining the pay parameters of a profit-sharing system. The intuitive explanation is roughly as follows. In long-run competitive equilibrium, because of migration pressure, each worker must end up with the same pay no matter what the ostensible form of the payment (how it is split between straight money wages and shares of profit). Given the fact that every firm must end up paying the prevailing wage whatever parameter values it selects, the profit-sharing firm can do no better in the long run than to hire labor to the point where the marginal revenue product of an extra worker is equal to the prevailing wage, then setting its pay parameters accommodatingly during contract time to yield that going compensation for its workers.

There are two major implications of this result. The first is that wage and profit-sharing systems are essentially isomorphic in a long-run stationary equilibrium with competitive labor markets. But, and this is the more important implication, the short-run properties of the two systems (when pay parameters are quasi-fixed) are quite strikingly different in the neighborhood of a long-run equilibrium position. As λ goes up, the corresponding competitive value of ω goes down. A genuine profit-sharing system in equilibrium will then be operating well inside the full employment region, with plenty to spare, while a wage economy is borderline full employment at best. A formal way of stating this idea is as follows.

When identical-twin wage and profit-sharing economies are placed in the same stationary environment, with competitive labor markets, both economies will gravitate toward the same long-run full-employment equilibrium. But then perform the following thought experiment. Disturb each economy and observe the short-run reaction when pay parameters are quasi-fixed but everything else is allowed to vary. The profit-sharing economy will remain at full employment after a disturbance, because the base wage determines desired aggregate output Y', while a contractionary shock will cause a wage economy to disemploy labor. And, after the identical adverse shocks to both systems, the wage economy will essentially display Keynesian characteristics, while the profit-sharing economy will continue to have essentially monetarist properties. It should not be hard to imagine why a profit-sharing system is then more resistant to stagflation than a wage system.

Let me note in passing that a profit-sharing system does not eliminate unemployment by, "in effect," lowering wages to the point where equilibrium is automatically maintained. The driving force behind full employment in a profit-sharing system is not a disguised form of wage flexibility in the usual, classic sense of that term. A profit-sharing system will remain at full employment even when worker pay is above the marginal revenue product of labor. The point is not that one system operates closer to equilibrium than another, but rather that the *form* of disequilibrium response to unexpected disturbances is different. Roughly speaking, the short-term response of a share economy holds the quantity of hired labor (and output) at its full-employment level, with the disequilibrium showing itself on the price (or value) side (workers are temporarily not paid their marginal value). Wage economies, on the other hand, tend to respond to contractionary shocks by holding equilibrium prices (or values) in line (workers are always compensated their marginal value) while the quantities of employment (and output) decline. In the long run both systems tend to the same equilibrium, but their short-run behavior out of equilibrium is quite different. And, of course, it is far more important for overall economic welfare that the system as a whole maintains a full-employment flow of goods and services throughout a contractionary shock than that some secondary marginal-value efficiency conditions on the level of the firm are being satisfied.

SOME BASIC QUESTIONS AND ANSWERS ABOUT PROFIT SHARING

So far I have outlined, in general form, the basic argument why, for a given level of autonomous spending and money supply, profit sharing tends to result in higher levels of employment and output with lower prices. The technical aspects of modeling a profit-sharing economy have

been treated in the literature.[5] Here I would like to deal with some of the major objections that have been raised. The most effective way to do this, I believe, is to answer questions the way they are typically posed by astute critics.

A system that shares profits is analogous to the notorious sharecropping system in agriculture. As everyone knows, and many of the classical economists pointed out, such a system reduces the incentives to invest because the capitalist must share some part of increased profits with the workers. Wouldn't profit sharing cause underinvestment, too little capital, and too low labor productivity?

The classical economists were wrong on this point, or at least incomplete. They had in mind a situation where pay parameters were more or less permanently frozen. In that case profit sharing would, indeed, cause underinvestment for the well-publicized reason that any incremental profits would have to be shared with labor. But over the longer time horizon relevant to decisions about durable capital investments, where either base wages or profit-sharing coefficients (or both) are relatively plastic and respond to quasi-competitive long-run labor market forces, both wage and profit-sharing systems stimulate equal efforts toward output-increasing improvements—to the point where the marginal revenue product of capital equals the interest rate. Even if this theoretical isomorphism between investment in wage and profit-sharing systems did not exist, the cost of capital is only one side of the picture, and probably the less important side. The other consideration is the demand side. If profit sharing results in a macroeconomic environment where output is being stabilized at or near the full-employment, full-capacity level, while a wage economy results in erratic, fluctuation-prone output and capacity utilization levels, there is bound to be more investment in a profit-sharing economy. And, as if these two arguments were not enough, interest rates, investment tax credits, and the like could be used to influence investment decisions in any system. The really important distinction concerns the average level of unemployed resources.

A key part of the mechanism causing a profit-sharing firm to want to expand employment is that the marginal revenue product of labor under such a system exceeds the marginal cost of labor. But this occurs because, in effect, the additional hired worker dilutes the profits per worker which the previously hired workers receive. Wouldn't this cause resentment by the already existing labor

5. See Weitzman (1983), (1984), (1985), (1986).

force against newly hired workers and, in extreme cases, lead to restrictions against new hires?

First of all, it is important to keep things in perspective by realizing that even a worse-case scenario where profit sharing "merely" dampens economic downturns by encouraging employers to lay off fewer workers during recessions still represents an economic benefit of potentially enormous magnitude. If profit sharing did nothing more than reduce downside risks to an economy, it would still be tremendously important. And when it comes to internal labor relations, let us not forget that the wage system is hardly a bed of roses. Younger, untenured workers are pitted against older, high-seniority workers in the jobs vs. wages decision. Featherbedding is widespread. Workers resist the introduction of new labor-saving technology and, more generally, take relatively little interest in the fortunes of the firm because they do not have any direct stake in its profitability. Worker alienation is widespread in an environment where the employer is essentially indifferent on the margin to whether the worker stays or goes.

Any system where a substantial number of the major firms are operating with the marginal cost of labor lower than the marginal value of labor will have an inherent predilection toward providing more employment and expanding output. This tendency may take a long time to be fully realized, it may be frustrated by aggressive unions (where they exist) or voluntarily slowed by the employers themselves. But if the incremental, hardly noticed decision at the margin has more of a bias than before to lean toward letting go of fewer workers during bad times and taking on more of them during good times, then gradually, perhaps imperceptibly, the system will ratchet itself toward an ever-tighter labor market. The point is not that widespread conversion to profit sharing would instantly result in full employment. To eventually create a tight labor market it suffices that during downswings a few less workers than under a wage system are laid off and during upswings a few more workers than under a wage system are hired. Why is the employers' incentive to maintain or even slowly increase employment in a system of widespread profit sharing likely to prevail over the insider workers' possible incentive to resist?

When an entire economy of profit-sharing firms is geared up and functioning smoothly, there is a significant excess demand for labor as a whole and there are no long-term jobless people to be picked up easily. New labor must come primarily from other share firms, presumably yielded up in grudging amounts. In a tight labor market the tenuous aftermath of hiring a few more workers in one profit-sharing firm will

scarcely be noticed, disguised as it must be behind a myriad of more important economic changes that much more directly influence short-term profitability. In a profit-sharing system, effort spent to enhance productivity and profits has a much higher payoff for the already-employed workers of a profit-sharing firm than effort spent on restricting new hires. It is worth noting that restriction of new hires becomes an issue only in those exceptional firms or industries where senior workers are trying to protect a noncompetitive pay level held artifically above the going market rate for that job category—new workers will have no incentive to join a firm in the first place unless they can receive a higher pay there than elsewhere.

So, as I see it, there will most likely be little trouble persuading unions to retain their working members once a profit-sharing system is geared up and running smoothly. (Can anyone imagine a situation where a union is pressuring the employer to lay off some of its members?) The more relevant issue concerns getting from here to there in an environment of less than full employment. For this purpose I advocate strong tax incentives making it in workers' strong self-interest to want to take some significant fraction of their pay in the form of profit sharing no matter what other workers in other firms are doing. In the U.S. context such tax incentives might take the form of a "working person's capital gains tax" which would tax profit-sharing income at the same reduced rates as long-term capital gains, up to some reasonable limit. I have calculated[6] that even under very extreme assumptions a substantial tax reduction for profit-sharing income would break even and pay for itself as a tax reform if it reduced the unemployment rate by just one percentage point. Any further reduction of unemployment from widespread profit sharing would translate into a federal budget surplus of some $30 billion per percentage point of reduced unemployment. The tax benefits would only be granted in situations where the union and employer explicitly agree to forswear any restrictive hiring practices. No union is compelled to petition for the special tax status of a share plan. But when it chooses to participate, a union cannot enjoy the considerable tax benefits without reaffirming an already existing legal commitment to open its ranks to as many qualified members and apprentices as the company wishes to hire under the agreed-upon share contract. This is a logical requirement for the government to insist on, since the entire raison d'être of the differential tax treatment is to encourage increased employment. In the U.S. today, approximately 17 percent of the work force is unionized and that percentage is currently declining at a rate of about one point per

6. See Weitzman (1984).

year. I cannot think of any compelling reason why the U.S. economy could not be purposely put on more of a profit-sharing basis. The European economies have a more solidaristic labor movement, are much more highly unionized, and in general display less flexible attitudes toward social and economic change. There is no question but that the introduction of widespread profit sharing would require a cultural revolution of sorts for European-style economies. On the other hand, these economies are suffering from extremely high unemployment rates, there is a pervasive sense that the old ways of doing things are inadequate, and there is some feeling that perhaps radical structural reforms are required.

It is best to be under no illusions about the political realities involved in making an economywide transition to a system based on profit-sharing principles. Some people are hurt by change, any change, and they will shout loudest to preserve the status quo even though, as with free trade, a share system is highly beneficial to the population as a whole. I believe that pure self-interest based on strong tax incentives in favor of profit-sharing income will go a long way toward convincing unions and others to look favorably upon a system that guarantees that aggregate output will be produced, and consumed, at the full-employment level even if it erodes the monopoly rent above the competitive pay which they currently enjoy. If the tax incentives are strong enough, a unionized firm will not only be enticed to join the share economy, but in a sense will be driven to enroll. It will be compelled because, if many other firms adopt share plans and if the pecuniary advantages in the form of tax savings are significant enough (larger than the union premium), a union will be unable to compete for members without following course. And the potential tax benefits could be made extremely attractive without doing fiscal harm to the federal budget since the increases in government revenues and decreases in outlays obtained from maintaining permanent full employment are so enormous. No union would be compelled to petition for the special tax status of a share plan. But when it chooses to participate, a union cannot enjoy the tax benefits without forswearing restrictive hiring practices. No matter how well-designed the incentives, such change will require genuine consensus, a general agreement cutting across left-right political lines, that the broad social gains of permanent full employment without inflation are worth more than the narrow private losses that will inevitably be incurred here and there.

In summary, then, it must be admitted that widespread profit sharing will probably alter the nature of industrial relations. There is no question but that workers sharing profits with management represents a different

way from the wage system of doing business in the labor market. In an imaginative paper, Daniel Mitchell has argued that share bargaining is likely to prove healthy and invigorating for American labor unions—calling for new expertise and an expanded role—even though most of the old guard will initially oppose it.[7] The relevant theory shows that if the firm retains control of the employment decision, other things being equal a profit-sharing system results in greater output, higher employment, and lower prices. The trick is to make the transition to profit sharing while preserving the employer's traditional right to decide, ultimately, the employment level, at the same time allowing workers to bargain over base wages and profit-sharing coefficients. I do not think this trick is all that difficult to accomplish because, in contrast to other "incomes policies," it builds on already existing natural tendencies. (Profit sharing is not an exotic innovation or a completely externally imposed artifice, but an already existing reality for many tens of millions of workers.) Besides, widespread conversion to profit sharing will probably require government incentives anyway (this point will be expanded later) and the issue then reduces to building into such incentives management's traditional right to expand employment.

Under a wage system the firm bears all the risk, while under a profit-sharing system the worker bears some risk. Doesn't profit sharing therefore represent a socially inefficient form of risk bearing, since the stockholder can naturally diversify risks more easily than the worker?

The reasoning traditionally put forward to support this "insurance" argument is fallacious, being based on a partial equilibrium view that does not take into account the radically different macroeconomic consequences of the two systems for overall employment and aggregate output. The fixed wage does not stabilize labor income. What is true for the individual tenured worker is not true for labor as a whole. When a more complete analysis is performed, which considers the situation not as seen by a tenured, high-seniority worker who already has job security, but as seen by a neutral observer with a reasonably specified social welfare function defined over the entire population, it becomes abundantly clear that the welfare advantages of a profit-sharing system (which delivers permanent full employment) are enormously greater than a wage system (which permits unemployment). The basic reason is not difficult to understand. A wage system allows huge first-order Okun-gap losses of output and welfare to open up when a significant slice of the national-

7. See Mitchell (1985).

income pie evaporates with unemployment. A profit-sharing system stabilizes aggregate output at the full-employment level, creating the biggest possible national-income pie, while permitting only small second-order Harburger-triangle losses to arise because some crumbs have been randomly redistributed from a worker in one firm to a worker in another. It is extremely difficult to cook up an empirical real-world scenario, with reasonable numbers and specifications, where a profit-sharing system with a moderate amount of profit sharing (say 20 percent of a worker's total pay) does not deliver significantly greater social welfare than a wage system. As if this argument alone were not enough, it would be a mistake to extrapolate the demand variability now observed in the firms of a wage economy to a share economy. Cyclical industries such as machine tools, metals, building materials, construction, and the like would not fluctuate nearly so much, since the share economy is permanently operating at or near full capacity. Every firm of a profit-sharing system would exhibit significantly greater demand stability than we are now accustomed to because a budding recession cannot feed upon itself in a fully employed economy. In addition, enterprising insurance companies are sure to offer to reduce risk further for the employees of big profit-sharing corporations by offering neatly packaged policies that will insure share fluctuations for a premium. (The insurance companies can cover themselves to some degree by selling the company stock short.)

If profit sharing represents such a great idea for operating a market economy, why don't we see more examples of it arising spontaneously?

There *are* some significant examples of profit sharing. In Japan, Korea, and Taiwan, it can be argued, modest (although significant) steps have been taken in this direction. The performance of these economies hardly supports the view that widespread profit sharing is likely to prove deleterious. In the U.S. economy, about 15 percent of firms have what they call profit-sharing plans. (It is questionable how many of these plans would satisfy reasonably objective economic criteria.) Although the issue has not been studied in a rigorous way, it is clear that many of these profit-sharing firms are among the most progressive, advanced companies in the economy. As just one informal indication, in a well-known book called *The 100 Best Companies to Work for in America*, over half of the cited companies identify themselves as having profit-sharing plans of some kind.

The reason profit sharing is not more widespread involves an externality or market failure of enormous magnitude. In choosing a particular contract form, the firm and its workers only calculate the effects on them-

selves. They take no account whatsoever of the possible effects on the rest of the economy. When a firm and its workers select a labor contract with a strong profit-sharing component they are contributing to an atmosphere of full employment and brisk aggregate demand without inflation because the firm is then more willing to hire new "outsider" workers and to expand output by riding down its demand curve, lowering its price. But these macroeconomic advantages to the outsiders do not properly accrue to those insiders who make the decision. Like clean air, the benefits are spread throughout the community. The wage firm and its workers do not have the proper incentives to cease polluting the macroeconomic environment by converting to a share contract. The essence of the public-good aspect of the problem is that, in choosing between contract forms, the firm and its workers do not take into account the employment effects on the labor market as a whole and the consequent spending implications for aggregate demand. The macroeconomic externality of a tight labor market is helped by a share contract and hurt by a wage contract, but the difference is uncompensated. In such situations there can be no presumption that the economy is optimally organized and societywide reform may be needed to nudge firms and workers toward increased profit sharing.

Alternative Structural Approaches

Profit sharing is not the only proposal for structural reform of the labor market that might help with the stagflation policy dilemma. In the next three sections I will try to assess critically what I see as three other major prototypes for structural reform of the labor market: incomes policy, two-tiered pay, and employee control. In effect I will be arguing that, although each may have a positive, constructive role to play, profit sharing is overall the most promising of the alternatives. But it is important, in my opinion, to have an open mind and to maintain a constructive attitude toward almost any structural plan that might have a reasonable chance of lowering unemployment. This is especially true for a world where, in the final analysis, political feasibility may well be the dominant constraint.

INCOMES POLICY

Understanding the term liberally, "incomes policy" is a tremendously broad subject with an enormous literature.[8] All I can hope to do here is

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8. Two recent books contain good bibliographies. For the United States see Rockoff (1985). For Europe see Flanagan et al. (1983).

place the subject in some comparative perspective as a labor-market policy.

The common strand of incomes policy is a desire to bring the economy back closer to the old-fashioned textbook Keynesian model by exerting some control over the upward pressure of wages and prices. The point of departure is the empirical observation that cost-push or sellers' inflation typically sets in well before the economy reaches full employment. If only prices and wages could be held down, Keynesian expansionary policies might be carried further toward full employment without triggering inflation.

Initially, incomes policy was primarily conceived as wage and price controls of the typical wartime variety. A major problem is that it is an enormous administrative task to control all, or even just the most important, prices in a market economy without introducing allocative distortions all over the economic landscape. During wartime, when the priorities are few and simple and the population is motivated to cooperate, this problem is perhaps not insurmountable. But it can become overwhelming during more normal times. Critics of incomes policy are typically quick to seize upon the microeconomic distortions as fatally damaging. Actually, the relevant consideration is whether the microeconomic distortions are more costly than the macroeconomic losses of income and output from conducting anti-inflationary campaigns without incomes policy. Here the answer is not so clear-cut, but old-fashioned wage-price controls still probably get the lowest grades out of the class of all incomes policies.

Wages are somewhat easier to control than prices, and, economic theory teaches us, it probably suffices to control them since prices are largely determined by wage costs. But wage control, while easier than price control, is still a difficult, messy business to administer. And, perhaps more to the point, controlling wages alone is widely viewed in a political context as being inequitable. There are schemes to get back some symmetry by also controlling "excess profits," but I doubt that this abstraction would much appease labor.

Another problem with traditional wage-price controls is what happens when they are removed. If in the meantime macroeconomic policy has not been appropriately adjusted, and it is frequently difficult to make the appropriate adjustments (both for informational reasons and lack of willpower), the economy may roar back to its previous position and much of the intended benefit will have been undone. The removal of wartime controls after the war is almost always a ticklish issue because of this problem.

While there is some debate about their empirical efficacy, the postwar

experience of several mixed economies that experimented with wage-price controls has not, on the whole, been very encouraging. There may be a legitimate short-period function for controls as part of a coordinated inflation-fighting strategy, but they are probably not viable in peacetime as a long-term device. This is especially true in a political climate where government intervention into individual markets is already viewed with no small degree of suspicion.

The United States experimented on a sporadic basis with voluntary wage-price restraints during the Kennedy-Johnson and Carter administrations. While a few studies have attempted to assess the impact,[9] no consensus has emerged concerning whether or not—or how much—good was done in halting inflation.

A more market-oriented class of incomes policy has emerged in the last fifteen years. Called TIPs (tax-based incentive policies),[10] this approach attempts to defeat cost-push inflation by making it expensive. A number of variants have been proposed. Most would tax wage and price increases above a certain prescribed norm. The advantage over straight wage-price controls is that the firm is allowed a certain degree of flexibility since it makes the choices, thus mitigating somewhat the degree of inefficiency in resource allocation that inevitably accompanies any form of incomes policy.

Like traditional wage-price controls, TIPs come in several variants—wages alone, wages and prices, wages and profits, etc. Any TIP plan shares with its wage-price control analogue the problem of administration because TIP is essentially a form of wage-price control where the penalty system is more flexible. Basically the same norm-setting dilemmas and bureaucratic problems are involved—if anything, it may be more complicated to administer TIP than wage-price controls because the exact *degree* of compliance must now be monitored.

Some proponents of TIP-like plans would maintain the plans permanently while others would use them only temporarily. One imaginative plan calls for a permanent wage tax offset by an employment subsidy.[11] The argument is that such a plan would help to lower the NAIRU[12] to the extent that it has been caused by monopolistic wage-setting practices. This approach seems more appropriate to the European context, and, indeed, most such ideas have originated in Britain.

There has been very little actual experience with TIP-like plans. The

9. See for examples the references cited in Colander (1986), especially in chapters 11 and 12.
10. Colander (1986) contains an extensive bibliography.
11. Jackman and Layard (1985).
12. Non Accelerating Inflation Rate of Unemployment.

closest we have come in the United States is the Carter administration's "real wage insurance plan," which was proposed by the administration but was never passed by Congress. The history of the real wage insurance plan, with its ever-increasing complexity attending each new rewriting, makes instructive reading for TIP enthusiasts looking for clues as to how such plans might have to look in practice to gain political acquiescence.

Despite the administrative drawbacks, and despite the inevitable loss of some allocative efficiency, the only fair economic comparison has to be made with the alternative of fighting inflation by purely macroeconomic strategies like policy-induced recessions. TIP-like policies might well form part of a policy package assault on bringing unemployment rates down without triggering inflation—in the United States and even more so in Europe—but the economics profession has been lukewarm or cynical and the public is no better than indifferent. I believe the essential problem is that such plans are viewed as inherently involving widespread government interference at a detailed microeconomic level, which goes against the political currents now flowing.

An even more ambitious type of incomes policy is MAP (market-based anti-inflation plan), which essentially makes a tradeable market in rights to inflate, the total number of certificates to be issued by the government. On a purely intellectual level it is quite a clever proposal. But, in a way, its cleverness is its own undoing in a world that can barely understand the logic of considerably simpler TIP-like plans. It seems hardly worth fighting for a plan that might involve somewhat superior theoretical properties than the better-known TIP but would probably face even greater difficulty in public acceptance.

My conclusion about incomes policies is this. They are capable of being a good short-term measure under certain circumstances as part of an overall strategy. Their principal drawback is political and social. Incomes policies are perceived as nonindigenous species. They have no counterpart or analogue in the private market, which the public can view as a natural antecedent. Instead, incomes policies are widely seen as representing a pure form of government interference directly at the microeconomic level where it is most threatening and least well tolerated.

TWO-TIERED PAY

While most pay systems are based, at least in theory, on the egalitarian principle of "equal pay for equal work," recently in the United States there have sprung up examples of inequalitarian two-tiered pay systems that explicitly pay new hires at a lower rate than previously hired workers were at first paid. Thus, a newly hired worker this year might be paid

significantly less than last year's new hire and be tracked onto a significantly lower pay ladder. Sometimes it is intended that such discrimination be "temporary"—say, for five years, or until the company regains greater profitability, or whatever—while in other instances the intended duration of the two different pay profiles is vague. The motivation behind two-tiered systems is fairly clear. In the present internationally competitive and deregulated environment, many firms have found themselves under great pressure to lower labor costs. But frequently there is resistance to so doing by noncompetitive forces—usually in the form of a militant labor union. To an extent that is astonishing by pre-1980s standards, there have been a fair number of union givebacks in cases where the company has forcefully threatened to otherwise shut down operations and produce mass layoffs. Two-tiered systems represent a kind of compromise position where the union retains higher pay than would otherwise be the case for its current members, but accepts reduced pay for new employees. It is not difficult to understand why unions basically dislike two-tiered pay systems and occasionally accept them, but with great reluctance, only as a lesser evil than lowering their own current members' wages. In industries with large turnover, two-tiered wage systems amount to a phased-in wage cut. But even without the turnover issue, acceptance of two-tiered pay poses a very unpleasant dilemma for a union. If "old" union members allow discriminatory pay, lower than they were themselves initially offered at a corresponding level of experience, for entering "new" members, why should the "new" union members, whose proportion is naturally increasing over time, defend the right of the "old" members to keep their arbitrary differential if and when the company seeks to lower or even eliminate pay differences the next time around? For this cogent reason, as well as the fact that union membership is diminishing (17 percent of the current work force and declining at a rate of about 1 percent per year), two-tiered pay systems are unlikely to become a significant phenomenon in the United States.[13]

As a theoretical matter, could the two-tiered wage system we now see occasionally springing up in the United States serve as a kind of model

13. Two-tiered wage systems are probably even more unlikely to become a significant factor in the solidaristic labor markets of Europe. The Japanese *nenko* system, as we shall see, has a relatively steep age-earnings profile, so that it is, de facto, a multi-tiered pay system. But the profile of length-of-service wage ratios is traditionally quite rigid, and therefore nondiscriminatory, so that the unions do not fear the playing off of one segment against the other or the lowering of "new" compared with "old" workers' pay. The type of two-tiered, or even multi-tiered, systems being discussed here are conceptually quite different, therefore, from the Japanese *nenko* system, wherein the firm, making a lifetime commitment to employment, presumably decides about new hires on the basis of something like a present discounted cost and benefit calculation.

approach to eliminating or greatly reducing unemployment on the macroeconomic level? This is not an easy question to answer. Probably a more widespread use of two-tiered systems might reduce unemployment somewhat. (It would certainly be difficult to argue otherwise—how could it possibly *increase* unemployment?)

One strike against such approaches is their explicitly inequalitarian nature, which, with or without labor unions, could be viewed as unfair, repugnant, or inherently conflictual. As opposed to this view one must ask, as always, whether the alternative of greater unemployment is less unfair, less repugnant, or less inherently conflictual. Still, I think there is a very fundamental difficulty with inequalitarian pay scales and with blatant violations of "equal pay for equal work," at the same level of experience and job tenure, in the American workplace at least, that are not so easy to wave away. I am not sure that creating a second-class citizenry within the same work organization will not lead to strong internal tensions, as it typically does in a wide variety of other contexts. The concept that all hired workers should be treated symmetrically (if not equally) by their company is, to my mind, a very deeply rooted culture myth.

Suppose it were conceded that two-tiered wage systems are likely to reduce unemployment somewhat. We might legitimately still wonder how far this effect is likely to go. The mainstream explanation of cyclical unemployment involves wage stickiness as a central ingredient. Why would not the second-tier wage also become sticky, even if not so sticky as the first-tier wage? The answer must depend greatly upon what one believes is behind the original first-tier wage stickiness. Whatever the ultimate explanation—and we have, of course, seen a great many theoretical attempts—it is difficult to envision circumstances that would make the second tier of wages singularly free of stickiness. While I am prepared to believe that more widespread adoption of two-tiered wage systems might help somewhat to reduce unemployment, it is difficult for me to think of this as a breakthrough solution concept worthy of any great proselytizing effort. The problem is that whatever forces are causing first-tier wage stickiness are likely, although perhaps in somewhat attenuated strength, to cause second-tier wage stickiness. Of course one could go to three-tier wage systems, and so on, but the endeavor seems remarkably like trying to sneak through the back door a wage flexibility that simply will not be allowed to pass through the front door. Far more desirable than the inequalitarian principle of unequal pay for equal work in the same workplace, I believe, would be a system that automatically preserves full employment even when sluggish pay parameters are frozen at the "wrong" levels.

EMPLOYEE CONTROL

"Employee control" is a term encompassing a broad spectrum of proposals for labor market reform. For some, the term connotes a quite radical reorganization of work relations—really some form of socialism or anarcho-syndicalism following loosely in the utopian tradition of, say, Robert Owen. Others see employee control as a minor but important variation on the prevailing capitalist theme, where workers merely own more of their company's stock, and thereby exert more control over its decisions. As might be expected, the kinds of suggestions for improving capitalism being considered here are often heavily tainted with ideological overtones. Indeed, ideology, rather than strictly economic considerations, usually determines a typical proponent's attitude. At the one extreme, worker management represents to some a kind of idealized democratic socialism. At the other, those who strongly advocate employee stock ownership plans are frequently attached to some vision of peoples' capitalism. In between are often-fuzzy images of workers' councils helping to create a more humane and more productive world. In this kind of potentially charged environment, I should make my own position clear. I am primarily interested in whether or not a proposed reorganization increases employment without accelerating inflation. The key operational question is whether or not, after a particular form of "employee control" is put into place, forces are set in motion that tend to increase, or at least to facilitate, the hiring of currently unemployed workers.

A common, typically implicit, article of faith among those advocating increased employee control is that by eliminating the sharp distinction between "us" who work for the company and "them" who own or direct the company, economic performance will be bettered. After all, if the workers own or control the firm, the distinction between wages and profits largely vanishes, or at least becomes blurred. Isn't it then reasonable to suppose that macroeconomic polices aimed at full employment in such an environment would be more effective because the push on wages, which bedevils current efforts to reconcile low unemployment with low inflation, would be greatly diminished? It is hard to have a problem of wage explosion, after all, when, at least in the extreme case, there are no wages.

A major problem with this line of reasoning is that it is not supported by the relevant theory.[14] Actually, the standard model of a labor coopera-

14. A good summary discussion with references to the literature is contained in Meade (1982).

tive whose members share an "earned surplus" dividend (instead of a wage) has rather perverse employment properties. When the objective of the cooperative is to maximize the dividend per member, what one normally thinks of as expansionary shocks actually cause the organization to contract membership, while what one normally thinks of as contractionary shocks induce expansion. Even granted that the model specification may not be entirely appropriate, one is left with the uneasy feeling that labor-managed firms are likely to have a contractionary bias compared with their capitalist cousins. The reason is that the existing members of the cooperative will desire to maximize not the total earned surplus, but the earned surplus *per member*. If existing members control the employment decision, they will be willing to expand output by taking on new members only so long as profits are increased at least in proportion to the increase in membership size. But this is a more restrictive criterion for expansion than the ordinary monopolist (who is interested primarily in increasing total surplus) typically applies. Hence, turning firms into worker co-ops whose members control the employment decision is likely to result in fewer, not more, new hires. Consequently, I would say, there is little basis for believing that labor cooperatives will aggressively attempt to integrate unemployed workers into their system. The absorption of unemployed outsiders would come about presumably through the creation of new cooperatives, which is, in my opinion, likely to prove at least as unreliable a stimulus to new hires as wage cuts in the more conventional setting.

There exists, additionally, a problem of risk sharing. As the point is usually made, there is a good reason why capital should bear more risk than labor—capital can be diversified in any portfolio, whereas labor tends to have but one job at a time. Therefore, it is better if the variable component of business income would accrue largely to capital, while the worker is paid a fixed wage. This argument, so widely parroted by economists and seemingly so plausible, is in fact deeply fallacious. An elementary fallacy of composition is involved. What is a correct statement for the individual high-seniority worker who already has job tenure is not necessarily true for the working class as a whole. The problem of unemployment is in fact the largest income risk that labor as a whole (as opposed to the median worker) faces. If more variable pay for the individual helps to preserve full employment for the group, while fixed pay tends to cause unemployment, it is not the least bit clear why overall welfare is improved by having the median worker paid a fixed wage. Actually, the correct presumption runs the other way around. For present purposes it suffices to concentrate on the fundamental issue of whether

or not the particular variable-income proposal under consideration tends to decrease unemployment. As I have indicated, the egalitarian cooperative does not appear to score high in this dimension.

James Meade proposes an imaginative variant of a labor-managed cooperative based on the "inequalitarian principle" that new hires are offered a different (presumably lower) number of shares than old hands. The proposal is somewhat of a hybrid between the two-tiered (or multitiered) payment system and the worker coop.[15] The major problem I have with all multitiered payment systems (whether based on inequalitarian wages or inequalitarian dividends) is in wondering why the nth tier of an n-tiered system should be assumed to be a perfectly flexible subject of rational discourse when the heart of the macroeconomic problem, or so it seems to me, is the disequilibrium created when pay parameters (of whatever sort) are inflexible in the face of changed demand conditions. Virtually any system assuming perfect flexibility of pay parameters for the marginal worker will yield full employment. But is this a reasonable assumption? Perhaps it is. Perhaps society can be turned in this direction. But I think that a more promising line is not to abandon the egalitarian principle, and not to abandon the idea that the capitalist determines the employment level, but rather to motivate that capitalist to hire more workers, expand output, and charge lower prices.

If, as most observers have believed, the very essence of a cooperative organization involves each member being treated equally with every other, so that no member has the feeling of being a second-class hired hand, then a legitimate question arises concerning why we do not see more examples of this organizational form. It is not for lack of trying. History is littered with examples of transient cooperative movements. Most failed to keep or attract members. A handful succeeded so well that they became bona fide corporations in their own right. Either way, there are remarkably few producer cooperatives in the modern industrial landscape.

Why this should be so was first addressed and, to my mind, brilliantly analyzed by the Russian Marxist economist Tugan-Baronovsky.[16] Tugan-Baronovsky wondered whether producer cooperatives might be an inherently unstable form of economic organization. His answer was yes. The reasoning is as follows. There are essentially two cases. If the cooperative fails to keep its dividend per worker up to the competitive wage level, its members, no matter how highly ideologically motivated, will begin to drop out in favor of jobs elsewhere (or if the current mem-

15. See Meade (1986).
16. See Tugan-Baronovsky (1921). Ben-Ner (1984) contains an excellent discussion of these issues.

bers don't, their children will). If, and this is the more subtle case, the cooperative succeeds so well that its members are earning dividends above the competitive wage, there will be strong economic pressures to expand. But why should the current members dilute their above-market earnings by admitting new members? If the present members would instead incorporate themselves and hire outsiders at the going rate, they would make more money. In the case of a successful co-op there is then a conflict between the economic motive of making money and the egalitarian motive, which constitutes the essence of the cooperative philosophy, of treating all members equally. As we know from many actual historical examples, the economic motive tends to win out and the original members of a successful co-op tend to evolve into capitalists of some sort while the new members become more like hired workers. In either of the two cases, then, the egalitarian producer cooperative is a transient, essentially unstable economic organization.

What about the more openly capitalistic variants of "employee control," such as employee stock ownership plans (ESOPs)? Proponents of this approach typically adhere to the following philosophy. Capitalism, they believe, is basically a very fine system. But it is marred by a too-concentrated ownership of the means of production in too few hands. Corrective measures should be taken to spread capital around, so that the community is more of a nation of capitalist-workers or worker-capitalists. Especially desirable would be a situation where the worker-capitalists essentially own the company they work for. Hence the motivation for a spate of tax gimmicks encouraging employers to pay workers stock in lieu of wages.

Whatever the possible political and social merits or drawbacks of a world of worker-capitalists, it is difficult to find a hard economic rationale in favor of worker capitalism as opposed to ordinary capitalism. When workers are paid stock in lieu of wages, why does that encourage the company to hire the unemployed or to keep down prices? It is true that certain delicately designed stock plans are actually much like profit sharing and do encourage additional employment on the margin. But the typical ESOP is not like this at all. (Perhaps it could be made more like this, for example by making the value of stock distributions proportional to profits per worker—and maybe the tax benefits should be only granted in these cases.) In any event such considerations are not usually what the typical ESOP supporter has in mind. Perhaps the fact that workers "own" a part of the company helps to moderate wage demands or motivates harder work. These might conceivably have macroeconomic consequences, although it is hard to believe they would be substantial. The idea that part of a worker's pay is linked to the well-being of the com-

pany (through the price of the stock) seems like a good idea that presumably helps to stabilize employment. What is typically lacking in such discussions is any kind of hard economic theory that clearly identifies motives and behaviors under employee stock ownership that would result in improved macroeconomic performance. Perhaps such a connection can be made, but it is presently elusive, at least for me. In this sense there is a strong contrast with profit sharing, where a relatively much more tight economic theory can be used to argue that there might be favorable employment consequences.

The one argument for worker capitalism I have found convincing concerns situations where particular industries or regions are under duress due to structural changes in the economy.[17] Plant closings can cripple a community. Sometimes unions that vehemently oppose concession bargaining or worker givebacks as an alternative to a plant closing will look less unfavorably upon employee ownership. The union's attitude in such situations is paradoxical because the very first thing the new worker-owners typically find themselves doing is taking a "temporary" pay cut. The same forces that made the plant uneconomical for the capitalist owners will invariably make it unviable also for the new worker-owners if the old wages must be paid. But since the mass layoffs attending plant shutdowns can be such a traumatic event for a community of workers and their dependents, we should not look lightly upon any measures, however much they might involve face-saving gimmicks, that can keep people employed a little longer. If the worker-owned plant is economically unviable, eventually the workers, or their children, will relocate to other industries or other regions. But in the meantime the forces necessitating such relocation will have been blunted somewhat, and the migration itself will take on more of a voluntary, gradual character, spurred on by the de facto pay cuts that invariably accompany worker ownership of a declining plant. In my opinion, temporary tax relief is warranted for workers wishing to own and manage a plant that would otherwise be shut down. However, I do not see in this particular argument, intended to give short-term relief under special circumstances, the germ of a valid general case for tilting an economy toward worker ownership.

Actually, my general instinct is that worker ownership, or even worker control, is basically not a good idea under most circumstances. It is hard to believe that the modern corporation (especially in an internationally competitive environment) can be effectively run by a committee of workers. The transience of worker cooperatives seems to me indirect evidence of this thesis. While there are bound to be specific exceptions, I fear that

17. This theme is developed more fully in Bradley and Gelb (1984).

a worker-managed firm would generally have difficulty making the hard choices that need to be made quickly in a fast-moving environment where specific circumstances of time and place are important. Managers representing workers would also, I believe, have some difficulty keeping up the torrid pace of technological innovation upon which all economic growth and welfare is ultimately based. I think it is ultimately in the workers' own self-interest (just as it is ultimately in the consumers' self-interest) not to sit on committees that democratically vote for what is to be produced and how it is to be produced, but rather to be presented with so many viable alternative job opportunities in a tight labor market that the capitalist overseers simply have no choice but to provide high pay and good working conditions.

Is Japan a "Share Economy"?

The task of comparing a particular theoretical model with the historical experience of an actual functioning economy and drawing from such an association the correct implications is one of the most challenging issues in economics. Again and again we are required to make such judgments because of the nature of economics. We cannot perform meaningful controlled experiments on the level of a national economy. Nor are the time series we confront sufficiently stationary, long enough, or possessed of enough variation to settle many vital questions. So, like it or not, we are forced back on the eclectic methodology of the historian to try to resolve many important issues. As is often the case in historical analysis, however, there is room for many coexisting interpretations. It is in this spirit that I want to report some empirical investigations of the Japanese bonus system.

It has long been noted that the Japanese labor market is "different." Perhaps the best operational statement of this observation is something like the following. If one makes pairwise comparisons of labor markets in OECD countries, they are more similar to each other than any one is to the labor market of, say, the Soviet Union. But the OECD country that looks least like the other OECD countries in pairwise comparisons is Japan. There are several ways in which Japanese labor markets look different.[18] The following stylized facts might be taken as roughly descriptive of how the "Japanese model" of the labor market differs somewhat from others.[19]

18. The remainder of this section contains some descriptive and summary material from Freeman and Weitzman (1986), q.v. for a more complete analysis of the Japanese bonus system.
19. Shimada (1983) contains an excellent survey of the English-language literature.

1. Firms hire workers for "lifetime employment" (the *shushin koyo* system). In fact this is done primarily by the large firms, and only for their so-called "permanent" or "regular" employees (who constitute, typically, over three-fourths of the total). Nevertheless, the "lifetime commitment mentality" seems to be a fair characterization of the Japanese system as a whole, which, if anything, is probably becoming more valid over time as the distinction between permanent and temporary employees seems to be breaking down.[20]

2. There is a steep age-earnings profile for permanent workers up to the retirement age of 55 or 60. Pay is determined primarily, but not exclusively, by seniority. (This *nenko* system is beginning to erode in many places as it increasingly comes to be viewed as anachronistic.)[21]

3. The Japanese workplace is a relatively cooperative and equalitarian environment. There are few work rules, job reassignments are common, and a high degree of company loyalty motivates productivity-enhancing behavior. Unions are organized along enterprise or company lines. Blue- and white-collar workers in the same firm are comparatively less differentiated than elsewhere in terms of perquisites, treatment, union coverage, method of payment (monthly salaries rather than hourly wages, with meaningful bonus payments), and how much they are paid.[22]

4. Japanese society as a whole displays a relatively intense commitment at a grass-roots level to maintaining full employment. Companies and unions seem almost ashamed to lay off workers outright. Layoffs are *not* by seniority. There appears to be a somewhat higher degree of social responsibility in wage setting, as was dramatically shown by labor heeding the 1975 call for wage restraint in the face of strong inflation caused by the first oil shock. Work sharing is common, as Japanese firms tend to adjust hours (±4 percent compared with ±2 percent in other OECD countries) rather than employment.[23]

5. A significant fraction of the average worker's pay is in the form of a semiannual bonus.

I will now describe the Japanese bonus system in some detail. But it should always be kept in mind that the bonus system is just one part

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20. Koike (1983a), (1983b), and references therein, sometimes argues the contrarian view that Japanese industrial relations, and particularly the lifetime employment system, are not nearly so unique as is sometimes supposed. He has a point when he does not push this view too hard. Perhaps a more balanced view is contained in Hashimoto and Raisian (1985).
21. For discussion of the *nenko* system, see, e.g., Shimada (1983) or Shirai (1983b).
22. For descriptions of the Japanese workplace, see Koshiro (1983a).
23. On many of these points see Shirai (1983b). Hours adjustments are discussed in Hamada and Kurosaka (1984).

of the complicated, interrelated web of institutions and attitudes that constitutes Japanese labor relations. It is difficult to sort out the pure economic role of the bonus from the roles of lifetime employment commitment, layoffs not by seniority, the *nenko* system, and so forth.

The typical Japanese worker's pay is divided into two categories. The first component is officially called *kimatte shikyusuru kyuyo*, "the wage that is surely paid," which we will refer to simply as base wages, or wages—although they are not really hourly wages at all, but rather a monthly salary. (Actually the whole concept of "overtime" payments and work is not sharply differentiated in Japan, suggesting that employment rather than person-hours is the fundamental unit of labor usage for regular workers.) The second component is called "special cash payments" in the official statistics and the defining characteristic is held to be that it is a payment made "temporarily, unexpectedly, or erratically at the discretion of the employer." This category consists overwhelmingly of bonus payments, even when their terms and amounts are established by collective agreements.

The bonus payments are a significant economic entity. In recent years they have constituted about one-fourth of a worker's pay. Economywide, aggregate bonus payments typically exceed before-tax profits.

Bonuses are usually paid twice a year—in summer (most frequently in June and July), and at year end (December). Insignificant amounts are sometimes paid in August, March, and January. The bonus probably traces back in history to the time when merchants gave small gifts to employees at Buddhist festival times. Although blue-collar and low-status white-collar workers before the war often received a lump sum of money twice a year in addition to their regular pay, the amount of money involved was tiny and in no way compared with the significant semiannual profit-sharing bonuses received as a mark of honor by high-status white-collar employees with advanced educational backgrounds.

Only after World War II did the payment system emerge in its present form, as part of a broader trend. The main feature of this trend was a deemphasis, to the point of near-elimination, of the invidious status categories of prewar Japan with their implicit legacies of a feudal past. As one byproduct of the immediate postwar process of democratizing the workplace, which the unions fully supported, all regular employees—blue-collar and white- —were henceforth to be paid a monthly salary instead of an hourly wage, supplemented by meaningful semiannual bonuses for every regular employee irrespective of category.[24] While

24. This interpretation is emphasized by, among others, Shirai (1983b), p. 131.

large relative to prewar and in comparison with other countries, at first the bonus payments constituted less than two months' worth of supplement rising gradually to over four months' by 1973 and falling back to slightly more than three-and-one-half months' currently. Economywide average bonus payments for regular private employees from 1958 through 1983 are shown in table 1 (expressed in months of base wages, which is how most Japanese think of it).

The bonus system is widely viewed as serving three purposes. One purpose is to compensate individual effort. Since the bonus is largely discretionary, as opposed to the base wage of the *nenko* system (which is primarily related to length of service), management typically makes some part of a particular employee's bonus depend on the merit ap-

Table 1   JAPANESE BONUS PAYMENTS
(in months of base wages)

Year	Bonus
1958	2.21
1959	2.38
1960	2.65
1961	2.90
1962	2.87
1963	2.99
1964	2.97
1965	2.97
1966	3.07
1967	3.17
1968	3.29
1969	3.54
1970	3.64
1971	3.79
1972	3.86
1973	4.26
1974	4.43
1975	3.96
1976	3.91
1977	3.83
1978	3.70
1979	3.76
1980	3.78
1981	3.77
1982	3.70
1983	3.60

Source. Bonus divided by wages; data from appendix.

praisal of the individual worker's job performance.[25] A second purpose of the bonus is to emphasize, symbolically and practically, the common bond linking the company's well-being with the well-being of its regular workers. Finally, the bonus system provides some pay flexibility to help firms maintain the lifetime employment commitment over bad times and good.

The timing of wage and bonus decisions frequently differs. Across typical unionized companies the general features of base wage determination are quite similar, being the primary concern of the economy-wide pattern-bargaining spring wage offensive (*shunto*) which typically starts in February and peaks in April. Bonus determination is by comparison a much more idiosyncratic process, with several different possible time patterns of negotiation, depending upon the particular firm or industry.

Bonus payments are also much more variable in amount than base wages, on an aggregate level having almost three times the standard error and displaying even more variability relative to wages on an industry level.[26] This reflects a prevailing philosophy that base wages are essentially related to the economy's national performance, while the bonus is more sensitive to a company or industry's specific circumstances. Firms typically try to pay a fairly steady number of months' wages as a bonus, and can often succeed in an expanding market, but will seek to impose a substandard bonus if the company suffers economic reverses.[27] Toyota, as an example of the first type, has paid about the same months' worth of bonus in each year since 1968. But for every Toyota Motor Company there are companies in, say, machine tools or shipbuilding where it is reluctantly accepted that bonuses may vary from zero to ten months' pay in extreme economic conditions. (At Okuma Machine Works, the standard deviation of the percentage change of wages is 7, compared with a standard deviation of the percentage change of bonuses of 29.) The majority of firms hold a position in between Toyota and Okuma. Surveys conducted by *Nikkeiren*, the employers' federation, show that most firms think of bonuses as being influenced by profitability. Among corporations that make an *explicit* agreement with employees about bonus payments, some 15 percent of such contracts contain profit-sharing clauses.[28]

25. See, e.g., Okuno (1984).
26. See Ishikawa and Ueda (1984), p. 141 and tables v-2 and v-3.
27. Koshiro (1983b), pp. 241–242, contains a good discussion of bonus responsiveness to profits.
28. See (Japanese Ministry of Labor, *General Survey on Wage and Working Hours System*.) It is useful to bear in mind that the aggregated data are masking a fair degree of diversity by

All this notwithstanding, I have also heard it said more than once by some specialists on the Japanese economy that bonus payments are so regular as to constitute a form of disguised wage. When pressed, such experts will cite examples like Toyota, where companies they know change only slowly, if at all, the number of months paid as bonus. A more sophisticated response observes in the data of table 1 some clear secular trends but no discernible yearly pattern of reacting to current business conditions. Clearly, bonuses have increased more or less stead-

Table 2   REAL JAPANESE PROFITS
(Fiscal year: in trillions of 1980 Yen)

Year	Profits
1959	1.74
1960	2.94
1961	3.29
1962	3.21
1963	3.82
1964	3.97
1965	3.93
1966	5.30
1967	7.08
1968	8.80
1969	11.82
1970	12.38
1971	10.32
1972	13.73
1973	22.55
1974	16.14
1975	7.11
1976	11.13
1977	11.25
1978	14.32
1979	19.51
1980	19.70
1981	15.18
1982	14.05
1983	14.62

Source. Nominal fiscal-year profits divided by appropriate price index; data from appendix.

firm size and industry. For example, small companies pay less wages *and* bonuses than large companies, have a lower bonus to wage ratio (by about 40 percent on average), and also display greater bonus variability. In finance, insurance, and chemicals, bonuses constituted about half of wages in 1974, while in construction or textile products they amounted to about one fourth.

ily from 1958 to 1974 and afterward have slowly declined. But there is no evidence in the regular time series of table 1 that a meaningful response is occurring to a volatile business cycle indicator like annual profits. Or is there?

In table 2 are listed real profits for Japanese companies.[29] The data are on a fiscal year basis, ending March 31. Coverage is roughly similar to table 1.

A first glance at tables 1 and 2 might appear to confirm the stereotype that bonus payments are independent of profitability. After all, real profits are fluctuating rather violently, while months of bonus paid, despite an undeniable trend, looks to be about as steady a sequence as one is likely to encounter in economic data.

But a second reading discloses some interesting possibilities. Look at deviations of real profits from their trend values. When profits deviate substantially from trend, there frequently seems to be a corresponding change of bonus payments in the same direction. A way of capturing this relationship is a standard lagged adjustment model of the form

$$B(t)/B(t-1) = [\pi(t)/\pi^*(t)]^a f(t).$$

In the above expression $B(t)$ represents bonus payments in calendar year t (expressed as months of base wages in the same year), $\pi(t)$ is real profits in fiscal year t (April 1 of year $t - 1$ to March 31 of year t, which builds in a natural lag consistent with most stories of bonus formation), $\pi^*(t)$ represents target or normal profits for fiscal year t, and $f(t)$ is a time term capturing trends in bonus growth that would occur even if profits were normal. The story being told by this equation is that bonus growth is possibly influenced by abnormally high or low profitability.

Taking logarithms of both sides, equation (1) might be estimated by the linear regression:

$$\log B(t) - \log B(t-1) = a \log \pi(t) + G(t), \quad (1)$$

where

$$G(t) = \log f(t) - a \log \pi^*(t)$$

29. Real profits are just nominal profits, from the data appendix, divided by an appropriate price index. Because profit data is on a fiscal year basis from March 31 to April 1, the deflator I have used is one-fourth of the current year's wholesale price index plus three-fourths of the previous year's wholesale price index. There are no dramatic changes in my story if I use other reasonable deflators. Note that because the bonus is subtracted out to obtain profits, if anything the regressions are biased against finding a positive relation.

is, for convenience, taken to be a polynomial in time. (In practice, additional polynomial terms of higher order are added until the coefficients start to become insignificant.)

Equation (1) is the prototype regression for this article. I hasten to add that I have tried a wide variety of alternative specifications, different data sets, etc.—all of which are consistent with the results I will report for equation (1) and tend to verify that the conclusions are quite robust. Regression results are summarized in table 3. They indicate that, in the aggregate, every 10 percent of profits below trend translates into a bonus payment about 1.4 percent lower than it otherwise would be. At 0.14, the elasticity of bonus response to profitability is not large, but at eight standard deviations from zero the coefficient is highly significant. Similar results are obtained when aggregate bonus changes are regressed on aggregate value added or revenues. In this case the elasticity of response is about 0.4. Overall, there is little question that the Japanese bonus contains a statistically significant profit- or revenue-sharing component.

We come now to an interesting and perhaps important question. Does the Japanese bonus system influence macroeconomic performance? Japan has had the lowest average unemployment rate among the major industrialized capitalist economies over the last quarter-century. This comparatively outstanding employment record survives corrections for discouraged workers, relatively flexible hours, definitional differences, and the like.[30] Does the existence of a revenue- or profit-sharing bonus

Table 3   THE BASIC REGRESSION: DEPENDENT VARIABLE: $\log B_t - \log B_{t-1}$

Independent variable	Estimated coefficient	Standard error	T-statistic
$\log \pi_t$	.14	1.76E-02	7.9
constant	3.2	.59	5.5
t	−.12	1.9E-02	−6.2
t^2	7.4E-04	1.3E-04	5.7

$R^2 = .82$
D-W = 2.39
Sample period: 1958–1983

30. It should be noted that Japan's number one status in having the lowest unemployment rate among major industrialized economies did not emerge until the 1970s. In the 1960s, some other countries like Germany had equally good employment records. There has been some discussion in the literature about the extent to which Japanese statistics may underestimate the unemployment rate by international standards. Taira (1983) and a few others have tried to argue this case. But it is not very convincing (see, e.g., Sorrentino (1984), Hamada and Kurosaka (1985)). The basic point is that when

component of pay help in any way to account for the comparatively low, stable unemployment rate in Japan?

This is a very difficult question to answer.[31] It is not even clear how to pose the appropriate hypothesis formally so that the existing data might, at least in principle, allow us to extricate an answer reasonably free from controversy. Yet the question is so tantalizing that one strains to get some sense of an answer, however tentative. Rather than trying to confront the issue head on with a formal model, I propose to limit myself here to some crude calculations based on a more pedestrian approach.

The first issue is to distinguish between the familiar pay flexibility that comes from responsiveness of pay parameters (such as base wages) to economic conditions, and the automatic pay flexibility that arises under revenue or profit sharing. From a wide variety of regression experiments run with the data presented here, I cannot find any formal statistical evidence that base wages alone respond to profitability. Some of the Phillips-curve-like pay-formation regressions in the literature have picked up, in some instances, a dependence upon profits.[32] But in many of these exercises the authors are attempting to explain the formation of total pay, defined as wages plus bonuses (and profits may be primarily affecting the bonus component), or else it is not clear what is included as "wages." The entire subject of empirical Phillips curve measurements for Japan is worthy of reexamination, with more careful attention focused on separating out base wages from bonuses in the pay-formation process. Meanwhile it seems safe to conclude, from results like those reported in table 3, that bonuses respond more than base wages to profitability, even if the issue of just how responsive to profits base wages are remains unsettled.[33]

It stands to reason that the existence of a bonus component of pay

reasonable adjustment measures are applied uniformly to all countries in an attempt to make international standards more uniform, then all countries' unemployment rates increase slightly, but without much altering their relative standing. Japan's unemployment record remains outstanding even after reasonable readjustments.

31. Issues of causality are immediately involved in a heavily interdependent social design like Japanese labor relations. Is the bonus system causing lifetime employment, or is lifetime employment causing the bonus system?

32. See, e.g., Grubb, Jackman, and Layard (1983), Koshiro (1983b), or the results reported in Hamada and Kurosaka (1985).

33. The lack of formal analysis convincingly identifying the degree of Japanese wage flexibility should not blind us to the probable fact that wages are, indeed, likely to be quite flexible, and this is almost undoubtedly playing some role in maintaining relatively high employment. The history of response to the first oil shock, recounted later in this article, while not easy to fit mechanically into a wage equation, bears ample testimony to this thesis. On this interpretation see Hamada and Kurosaka (1985).

with a more automatic procyclical link than base wages should help an economy to maintain a higher level of employment, other things being equal, than if wages alone were paid.[34] But how important a factor, quantitatively, is this likely to be in the Japanese case? Some very rough calculations can be used to indicate the orders of magnitude possibly involved.

The bonus itself is about one-fourth of an average worker's total pay. By running regressions in logarithms the elasticity of aggregate bonus response to changed aggregate profits was estimated at about 0.14. Converting this interpretation to a linear formula, the same elasticity of 0.14 is obtained if 14 percent of the bonus payment is strictly proportional to profits, while the other 86 percent is like a fixed constant. The following crude imputation can then be made. About 3.5 percent (14 percent × 25 percent) of a Japanese worker's total pay can be treated as genuine profit-sharing income, compared with the other 96.5 percent, which for economic purposes is better described as being like an imputed base wage.

A rough check on this calculation is possible. The elasticity of aggregate bonus payments with respect to aggregate value added, or revenue, was estimated to be about 0.4. Converting to an equivalent-elasticity linear revenue-sharing formula makes 40 percent of the bonus payment strictly proportional to revenues, while the other 60 percent is like a fixed constant. If aggregate imputed base wages are roughly three-fourths of aggregate revenues, that leaves one-fourth for gross profits. By this calculation, roughly 10 percent (¼ × 40 percent) of the bonus payment is strictly proportional to profits, while the other 90 percent is like a fixed constant. Following this line of reasoning, about 2.5 percent (10 percent × 25 percent) of a typical Japanese worker's total pay can be treated as genuinely proportional to profits, while the remaining 97.5 percent is like an imputed base wage.

Splitting the difference between these two calculations, we can make the following very rough statement. In any year about 97 percent of an average Japanese worker's total pay is like a fixed imputed base wage, while 3 percent automatically responds directly to profits. If pay contracts are annually renegotiated, the marginal cost to the employer of hiring an extra unit of labor in any given year is just the (imputed) base

34. This is akin to the proposition that a profits tax causes less unemployment than an equivalent tax on labor. A cynic might argue that the bonus is merely a label for the (more) flexible component of pay, there otherwise being not much essential difference between overall pay response to profitability between Japan and other countries. While this is a logically consistent position, I think the fact that the Japanese have a category called "bonus" that is significantly more dependent on profitability than "wages" is a relevant piece of information suggestive of a direct profit-sharing link.

wage, as opposed to total pay.[35] The relevant theory[36] then predicts that the Japanese economy should behave like an otherwise absolutely identical (but strictly hypothetical) wage economy whose wages are 3 percent lower than actual Japanese pay (base wages plus bonus) but whose maintained levels of aggregate demand (autonomous spending, the money supply, and world demand for Japanese exports) are the same. In other words, if someone who thought that Japan was a wage economy and has just now been informed that it is in fact (partially) a revenue- or profit-sharing economy wants to know what difference that makes, the answer is: the same difference *as if* money wages were perpetually devalued 3 percent below what you had previously believed them to be. While the exact ramifications of a 3 percent wage cut depend on a lot of assumptions about the magnitudes of various elasticities, my intuitive reaction is neither to dismiss this as being an altogether negligible effect nor to be impressed that it is likely to represent a major economic force.

This kind of counterfactual historical exercise should be understood in proper perspective. First, the calculations are extremely crude. Second, they are based on a particular interpretation of a particular theory. Third, the "thought experiment" is necessarily artificial. (If there were lower bonuses but higher base wages, it could be argued, wages might become more flexible, timing in the economy might be altered, or fiscal or monetary policy might be changed, perhaps thereby neutralizing some of the effects calculated here.)

These limitations notwithstanding, I think the exercise is useful for gaining some rough insight into the likely size of what might be called the "pure bonus effect." The numbers seem to point out a middle ground between two extremes. I would interpret the orders of magnitude involved as suggesting that the Japanese bonus system may have exerted a non-negligible macroeconomic influence by helping automatically to boost employment without inflationary pressure. But the significance of an "as if" 3 percent money wage cut is not nearly so great as to account for the entire unemployment story, nor to eliminate output fluctuations,[37] nor to repeal the laws of macroeconomics, nor to do away with

35. If the relevant contract adjustment period is more than a year because of pay parameter stickiness, the profit-sharing component grows in importance relative to the base wage component because of the distributed-lag difference equation buildup. In that case the effect of profit-sharing is somewhat more pronounced. It is hard to imagine how imputed base wages as seen by the employer could decline much more than about 5 percent below total pay.

36. See Weitzman (1985). The basic idea is that the effect on the firm of converting 3 percent of pay from base wages to profit shares is to lower wages by 3 percent while simultaneously being subjected to a compensating tax on profits.

37. Depending on how output is detrended from its high growth rates, Japanese output

the need for discretionary policy to maintain full employment, especially in the face of severe economic shocks.

That the bonus system alone cannot possibly be explaining the entire macroeconomic adjustment story is made abundantly clear by the rather non-neoclassical history of Japan's response to the energy crisis. After the first oil shock, in 1974, consumer prices increased by about 25 percent and wholesale prices by over 30 percent. At first the unions had no better premonition than anyone else that a permanent terms-of-trade deterioration was under way, and were concerned to recoup lost purchasing power as well as to obtain their customary pay increase. In the spring offensive of that year, base wages jumped by 33 percent. At this point, when the mechanics of a potentially vicious wage-price spiral started to become evident, the famous Japanese consensus took over. Government officials, labor experts, businessmen, and labor union leaders began preaching wage and price restraint. The 1975 *shunto* saw base wages increase by only 13 percent, and they have been held to the single-digit range since then. However much the Japanese bonus system may be helping as an automatic employment stabilizer (months of bonus pay declined sharply after 1974—see data appendix), it is but a drop in the ocean when a major macroeconomic shock impacts.

Conclusion

In this article I have argued that substantial progress in the struggle for full employment without inflation will have to come largely from basic changes in pay-setting arrangements rather than from better manipulation of financial aggregates. I think the analysis presented here suggests that widespread profit sharing, along the lines of what is practiced in Japan, represents a structural reform of the labor market likely to improve the unemployment-inflation tradeoff.

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stability might be judged outstanding or mediocre. Actually, Japan has the steadiest growth rate among all OECD countries over the past quarter-century if it is measured by *relative* deviations from a standardized mean of one. In terms of *absolute* deviations (from a nonstandardized mean), Japanese growth shows much more cyclical variability. Note that, with a sprinkling of temporary price stickiness, the relevant model of a profit-sharing economy would predict relatively full employment but some building up of inventories, make-work, or labor hoarding during slack periods. Thus, the large Okun coefficient for Japan (see Hamada and Kurosaka (1984)) is not in itself a theoretical contradiction with share-economy-like interpretations.

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Table 4   THE BASIC DATA SERIES

Year	Wage	Bonus	Profits	WPI
1958	15.733	2.895	NA	41.7
1959	16.676	3.301	.821	42.1
1960	17.818	3.929	1.401	42.6
1961	19.487	4.712	1.585	43.0
1962	21.896	5.235	1.550	42.3
1963	24.231	6.030	1.832	43.1
1964	26.801	6.624	1.931	43.2
1965	29.485	7.294	1.916	43.5
1966	32.424	8.288	2.617	44.5
1967	35.778	9.465	3.570	45.4
1968	40.439	11.090	4.512	45.7
1969	46.078	13.586	6.128	46.7
1970	53.228	16.150	6.578	48.4
1971	61.165	19.353	5.619	48.0
1972	70.456	22.644	7.449	48.4
1973	83.674	29.701	12.799	56.1
1974	104.311	38.478	11.015	73.7
1975	122.766	40.463	5.956	75.9
1976	137.180	44.666	9.648	79.7
1977	150.921	48.197	10.163	81.2
1978	162.078	50.041	13.030	79.1
1979	170.416	53.341	17.722	84.9
1980	181.102	57.073	19.704	100.0
1981	190.832	60.015	17.174	101.4
1982	198.736	61.231	16.132	103.2
1983	205.610	61.702	16.924	100.9

DATA APPENDIX

Table 4 contains the basic data behind the regression results. Data are from the following sources.

Wages and bonuses are from the Japanese Ministry of Labor, *Yearbook of Labor Statistics*. Wages are average monthly contractual cash earnings and bonus is average monthly special earnings. Both are for regular employees, expressed in thousands of yen, covering establishments employing five or more people in all industries.

The profits data are from the *Japan Statistical Yearbook* and refer to net recurring profits valued in trillions of yen. Data are on a fiscal year basis (March 31 to April 1), covering all for-profit corporations except financial and insurance corporations.

The wholesale price index is from the *Japan Statistical Yearbook*. The price index used to deflate fiscal year profits is one-fourth of the current WPI plus three-fourths of the previous year's WPI.

Comment

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Since my assignment is to discuss a document of persuasion, I feel compelled to begin with a truth-in-packaging warning: when Weitzman preaches to me, he is preaching to the converted. I still remember the excitement with which I read his first paper on the subject in 1982. Shortly thereafter, I invited him to start spreading the gospel to macroeconomists at an NBER meeting at Princeton. It was my *Boston Globe* and *Washington Post* columns in February 1985 that helped launch the media blitz for his book that led up to the *New York Times* branding the share economy "the best idea since Keynes."[1] And I was the organizer of the AEA session on the share economy in December 1985 in New York, and the only speaker who came there to praise Weitzman rather than to bury him.[2] So what you are about to read may smack of Aaron criticizing the Ten Commandments.

1. See my "Work-for-all Scenario," *Boston Globe*, February 5, 1985 and "Share the Wealth," *Washington Post*, February 10, 1985. The quotation from *The New York Times* is the title of a March 28, 1985 editorial.
2. The other speakers were R. E. Hall, W. D. Nordhaus, and L. H. Summers. The proceedings of the session will be published in a forthcoming issue of *Challenge*.

However, not even Moses was flawless. (As we know, he led the Jews to the only spot in the Middle East that is devoid of oil.) So let me start by criticizing something in Weitzman's explanation of the share economy—something that I and others have often found confusing. After reading his latest offering twice, I am convinced that Moses here is largely to blame for the confusion.

Despite Weitzman's many disclaimers, I have heard it said many times that he claims to have found a way to lower the natural rate of unemployment. My understanding is otherwise. A share economy does not have a lower natural rate of unemployment than a wage economy because the two have exactly the same long-run equilibrium. But a share economy should have a lower average rate of unemployment over any particular historical period because disequilibrium in a share economy does not manifest itself as unemployment.

I believe this is Weitzman's position, but the reader can perhaps be forgiven for drawing the wrong conclusion from statements like these (there are others):

"No matter how one interprets the 'other things being equal,' a profit-sharing system is more expansionary than a wage system."

"Conversion from a wage system to a profit-sharing system (with a smaller base wage) is equivalent to lower factor costs coupled with a pure profits tax."

"The relevant theory then predicts that the Japanese economy should behave like an otherwise identical wage economy whose wages are 3 percent lower than actual Japanese pay."

The difficulty comes in reconciling short-run and long-run behavior. Suppose labor is paid a base wage, w, plus a share, s, of the profits per worker after base wages are deducted:

$$W = w + s((R - wL)/L) = (1 - s)w + s(R/L). \quad (1)$$

Since the firm wants to maximize

$$R - WL = (1 - s)R - (1 - s)wL, \quad (2)$$

its short-run equilibrium condition, Weitzman seems to suggest, is:

$$R'(L) = w. \quad (3)$$

Since $w < W$, this implies higher employment than under a wage system that pays wage W.

In the long run, however, Weitzman stresses again and again that the

pay parameters w and s will adjust so that the total compensation implied by equation (1) is precisely equal to W^*, the neoclassical real wage, when L is at its neoclassical equilibrium value, L^*. Now, we know that L^* and W^* are related by

$$R'(L^*) = W^*. \quad (4)$$

How can equations (3) and (4) hold at the same time when the full-employment version of equation (1),

$$W^* = w + s((R(L^*) - wL^*)/L^*), \quad (1')$$

implies that $w < W^*$ if $s > 0$? The answer is that they cannot. A firm in a share economy typically cannot acquire enough labor to satisfy equation (3); it is left in a position with excess demand for labor since $R'(L) - w > 0$.

Figure 1[3] may help explain what is going on, and suggest what Weitzman still needs to clear up. In this diagram, $AC = (1 - s)w + s(R/L)$ is the average cost of labor given by equation (1), $MC = (1 - s)w + s R'(L)$ is the corresponding marginal cost, and $R'(L)$ is the marginal revenue product. Point A, where $MC = R'$, satisfies equation (3), and seems to be—but probably is not—the short-run equilibrium of the firm. Point B is the neoclassical long-run equilibrium defined by equation (4). Long-run equilibrium is generated, Weitzman explains quite clearly, by the adjustment of the pay parameters s and w until the AC curve rises or falls to pass through point B.

The figure illustrates the two key features of a share system. First, the firm has an excess demand for labor at its long-run equilibrium in the sense that, given the pay parameters, it wants to hire more labor because $R' > MC$. Second, if long-run equilibrium is perturbed by a contractionary shock that lowers R', the firm will not reduce its employment. Both $\hat{L}$ and L^* will fall; but so long as the *new* $\hat{L}$ remains above the *old* L^*, employment will not be reduced.

The question that Weitzman needs to clear up is precisely what happens in the short run. Sometimes he seems to suggest that the firm actually atttains point A. But that is possible only if workers are willing to work at a total compensation below the competitive wage. The essence of Nordhaus's criticism is that workers ought not to behave this way.[4]

One possible answer is that workers in a share system are tied contrac-

3. From William D. Nordhaus, "Can the Share Economy Conquer Stagflation?", mimeo, Yale University, May 1985.
4. Ibid.

Figure 1

Competitive Wage

$AC = (1-s)w + s\dfrac{R}{L}$

$MC = (1-s)w + sR'(L)$

$R'(L)$

w^*

B

A

L^*

$\hat{L}$

L
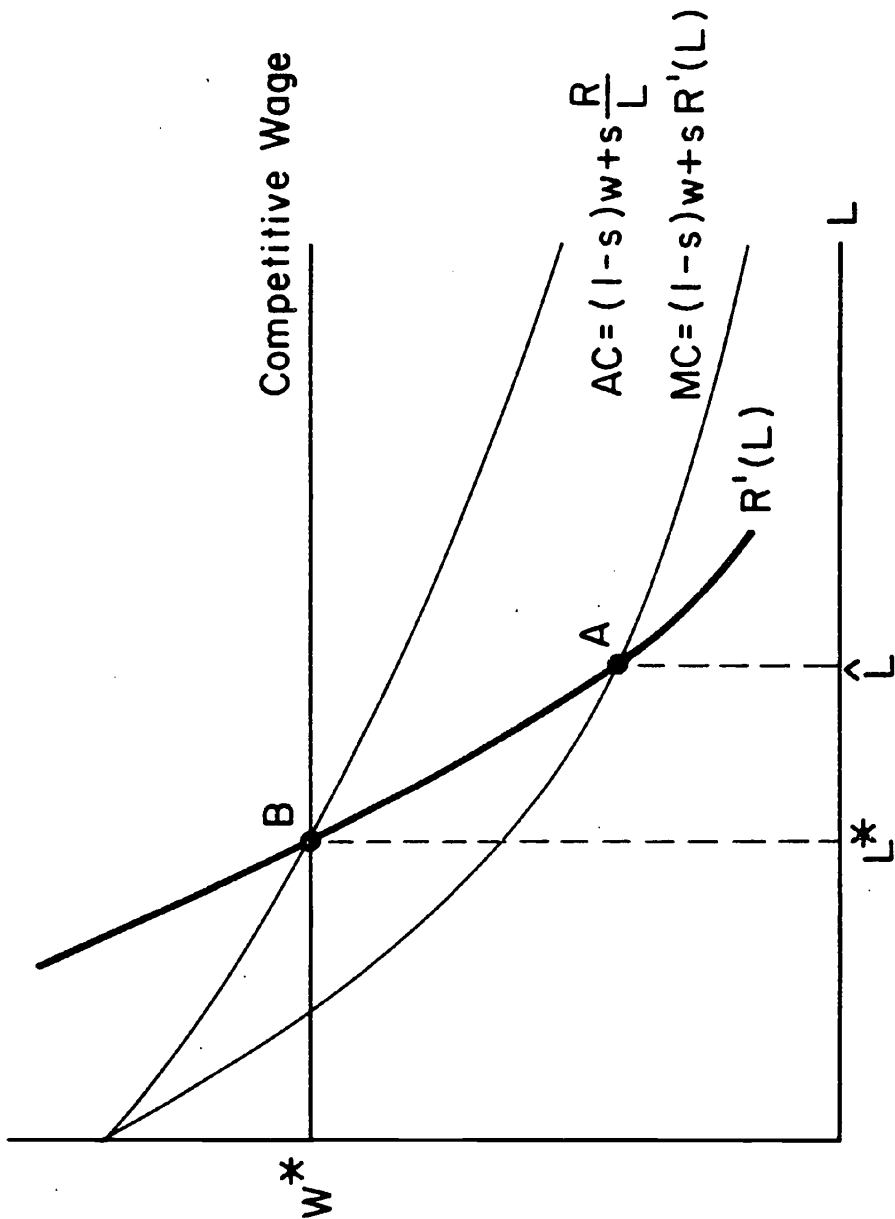
tually to a firm for a period of time. Their implicit or explicit contract
includes an understanding that the profit-sharing component of com-
pensation may sometimes decline enough to bring W below W^*. In
return for accepting this risk of lower compensation, workers are guar-
anteed that they will not be laid off. If this share contract is preferred to a
standard wage contract with wage W^*, the worker takes the job. If not,
he refuses it in favor of the standard wage contract. Long-run equi-
librium would then require that the contract terms, w and s, be set to
make workers indifferent between the two contracts. To Weitzman, who
assumes risk neutrality, this means that (1') holds. But the equilibrium
condition in the contract model I have just sketched is different. It says
that *risk-averse* workers must get the same *expected utility* from a wage
contract that offers W^* when employed and zero when unemployed as
they do from a share contract that offers equation (1), which is random
because L is random.

In one section of his article, Weitzman poses and answers four ques-
tions. My next point pertains to the second and third of these. The main
reason, as I see it, why share systems are not generated spontaneously
by the free market is that they are against the interests of senior workers.
In forgoing a fixed wage contract for a share contract, a junior worker
accepts some wage-rate risk in return for eliminating the presumably
much greater risk of unemployment. That sounds like a potentially at-
tractive bargain. But senior workers bear none of the unemployment
risk, and so have no incentive to change from a wage system to a share
system. In fact, they have an incentive to switch in the opposite direc-
tion should a share system be adopted.

That is why Weitzman proposes a tax subsidy plan to encourage the
adoption of share contracts. Note that this plan is not a *temporary* mea-
sure designed to shove the economy from a bad equilibrium to a good
one, but a *permanent* feature of the economic landscape that would
change the free-market allocation. I would like to propose an alternative
plan—or rather, half a plan because it creates a problem of its own—for
achieving the same end without tax distortions.

Instead of Weitzman's prototypical profit-sharing plan, suppose firm i
pays a nominal wage rate that is indexed to its own price:

$$w_i = b\, p_i.$$

If the firm has a downward-sloping demand curve, this compensation
system has the critical property that drives Weitzman's analysis: $dw_i/dL_i < 0$, so that marginal labor cost is below average labor cost. So far

this is no better than profit sharing. Instead of bearing the risk of profit fluctuations, workers now bear the risk of relative price fluctuations because the real wage paid by firm i is

$$w_i/p = bp_i/p,$$

where p is the aggregate price index. That is not an obvious improvement; indeed, the two risks are quite similar.

The difference is that relative price risk can be diversified away because an appropriately weighted average of all relative prices must always be 1. Let a mutual fund be established into which each firm pays bp_i per worker. If the fund gets the weights right, each worker, regardless of which firm he works for, can then draw out bp, where p is the weighted average. So the firms get the hiring incentive that Weitzman seeks, the workers get an indexed wage contract with little if any risk of unemployment, and the fund is perfectly self-insured.

There is, however, a difficulty with this scheme. I first worked it out about ten years ago as a way to create indexed wages for workers without requiring risk-averse firms to pay indexed wages.[5] At that time, I suggested that each firm should pay wages tied to an industrywide price index (say, a piece of the PPI), or to a weighted average of such indexes, to prevent it from manipulating its price index to reduce its wage rate, e.g., by running a sale or by outright cheating and misrepresentation.

Of course, reducing the wage rate by running a sale is exactly what we want firms to do under Weitzman's plan. So we really do need firm-specific, not industry-specific, price indexes to create the proper employment incentives. That leaves the cheating problem.

It is a genuine problem but not, I believe, an insuperable one. If both a firm and its union wish to avail themselves of Weitzman's plan, the mutual fund should be able to create firm-specific price indexes that are agreeable to both parties. The critical features are:

(a) that the weights be known and fixed for the duration of the contract (so the firm cannot manipulate the index by changing its product mix);

(b) that the specific prices that comprise the index be well defined and readily observable (so both firm and union can monitor the index).

I know there would be many little practical problems in creating such

5. Alan S. Blinder, "Indexing the Economy through Financial Intermediation," in K. Brunner and A. H. Meltzer, eds., *Stabilization of the Domestic and International Economy*, Carnegie-Rochester conference series, vol. 5, 1977, pp. 69–105.

price indexes. But the BLS copes with such problems every day. And the private sector would quickly learn to use the BLS as a training ground. Besides, like Weitzman, I am disinclined to let a few little Harberger triangles stand in the way of destruction of a big Okun gap.

The Japanese evidence is important to Weitzman's proselytizing campaign since Japan, among all the major countries on earth, seems closest to the share economy ideal. I have a few comments on Weitzman's empirical work.

First, the regression does not represent the profit-sharing formula. Multiply equation (1) by employment and take L to the other side to get

$$WL - wL = s(R - wL). \quad (5)$$

It is s that Weitzman should be trying to estimate, though his regression estimates an elasticity instead. The lefthand side of equation (5) is the bonus: total compensation minus base wages; call that B. The righthand side, however, is not profits but revenues minus base wages, that is, the sum of bonuses plus profits; call that Z. If profits are replaced by Z in Weitzman's regression, the estimated elasticity rises from 0.15 (in my replication of his regression) to 0.25.[6] The implied slope coefficient, s, however, is essentially the same as Weitzman's since Z is so much larger than profits.[7]

Second, the nine-month lag between profits and bonuses that Weitzman builds into the equation seems contrary to the spirit of the share economy. If marginal labor costs are to be below average labor costs, then labor must get a share of *this period's* revenue. If it gets, instead, a share of *last period's* revenue, then the bonus is actually a fixed cost relative to this period's employment decision.

Third, Weitzman's equation does not look to me like a standard lagged adjustment equation. I would have thought the partial adjustment model is something like

$$B(t) - B(t-1) = a(B^*(t) - B(t-1)),$$
$$B^*(t) = sZ(t);$$

6. All my regressions use a cubic time trend. The 0.25 estimate has a standard error of .035. When the right-hand variable is changed in this way, the fit of the equation hardly changes.
7. If e denotes the estimated elasticity, then the desired slope is $dB/dZ = eB/Z$, which is 0.11 evaluated at the means. In Weitzman's regression, which uses profits in place of Z, the corresponding slope is 0.12.

in levels or

$$b(t) - b(t-1) = a(b^*(t) - b(t-1)),$$
$$b^*(t) = \log(s) + z(t),$$

in logs (where lowercase symbols are logs of corresponding uppercase symbols). These lead to the following two empirical models:

$$B(t) = (1 - a)B(t-1) + asZ(t) \quad (6a)$$

$$b(t) = (1 - a)b(t-1) + az(t) + a\log(s) \quad (6b)$$

Equation (6b) comes close to what Weitzman estimates, except that he uses $b - \log(wL)$ rather than b and constrains the coefficient of the lagged dependent variable to be 1. Note, however, that the coefficient of z in (6b) is an estimate of the *adjustment speed*, not of the *share parameter*. Extracting an estimate of s from the log specification is more than a little tricky since it comes strictly from the constant—which can pick up anything. In any case, if we drop Weitzman's constraint that the coefficient of the lagged dependent variable is 1.0, the estimate of a rises from 0.15 to 0.87. By comparison, if we run equation (6b) without constraining the coefficients of $b(t-1)$ and $z(t)$ to sum to unity,[8] the estimated adjustment speed is 0.88. So substitution of z for profits seems unimportant. Remember, however, that these very rapid estimated adjustment speeds are layered on top of a built-in nine-month data lag.

To estimate s, which is the parameter of interest, directly, I ran three versions of equation (6a). The first was equation (6a) precisely; it yielded an implied estimate of s of 0.09. With no partial adjustment (a constrained to 1.0), the corresponding estimate was 0.07. Generalizing slightly beyond the Procrustean bed of geometric distributed lags by adding $Z(t-1)$ to the regression reduced the estimate of s to essentially zero, however. In this richer specification, $Z(t)$ and $Z(t-1)$ receive coefficients that are roughly equal in magnitude and opposite in sign, suggesting perhaps that changes in Z, not levels, influence bonus payments.

Suppose that s is between zero and 0.1. What do we do with this estimate? Based on mean values of all the variables in equation (1), s in this range implies that, on average, between 0 and 6.3 percent of Japanese labor compensation has taken the form of true bonus payments.[9]

8. Unconstrained, the two coefficients add up to 0.97. That seems more than close enough to me.
9. For comparison, putative bonus payments averaged 30.7 percent of base wages in the sample.

Weitzman's estimate is squarely in the middle of this range so, having wondered about the method he used to arrive at his estimate, I wind up having no quarrel with the number.

Finally, I would like to close with an intriguing question that Lawrence Summers posed at the 1985 meetings and that I would like to hear Weitzman answer. Capital gets 100 percent profit sharing in our economy now. Yet it is unemployed as frequently as labor. Why? I suspect the answer has to do with ex post fixed proportions; firms lay off labor when the price it must pay for the marginal unit of labor-cum-capital is too high. But Weitzman, not Blinder, should be answering these questions.

Comment

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Weitzman's article is part of his continuing research on the macroeconomic implications of alternative compensation schemes. The key issue addressed is whether or not privately determined labor arrangements are socially optimal. In particular, can the employment and compensaticn rules negotiated by workers and firms produce inefficiencies that are of macroeconomic significance? Weitzman answers with a loud and resounding "Yes" and advocates the adoption of a share system to correct these problems.

I think Weitzman deserves an enormous amount of credit for directing attention to this line of inquiry. This area of research is important from the viewpoint of both standard macroeconomic analysis and the theory of labor contracts. From the perspective of macroeconomic policy making, it forces one to think more deeply about the source of the inefficiency that aggregate policies are supposed to correct and augments the set of policy tools one may consider. As Weitzman suggests, it is important to think beyond the conventional set of aggregate stabilization policies. From the perspective of labor contracting theories, it forces one to consider the design of labor contracts between private agents from a general equilibrium perspective. Perhaps labor contracts can be optimal from the viewpoint of the contractants and yet, in the presence of externalities, produce inefficiencies at the macroeconomic level. Given all of the difficulties in finding a convincing model of employment inefficiencies at the worker-firm level, this alternative view should be welcomed.

The problem of evaluating alternative compensation schemes is ame-

nable to standard welfare analysis. First, we need to carefully specify preferences, endowments, technology, and the like for the economy in question and then proceed to characterize the decentralized allocations. Second, holding the environment fixed, we solve for the set of constrained Pareto optimal allocations—where the constraints on the planner reflect those faced by private agents. Finally we ask whether the decentralized solution is in the set of Pareto optimal allocations. If not, interventions can be designed to correct these inefficiencies.

This methodology forms the heart of traditional economic analysis. The key to doing it properly is to carefully keep track of the economic environment, in particular, the informational and trading constraints that agents face. Both the welfare evaluation of the decentralized solution and the prescription of policy must be consistent with the environment of the decentralized solution.

Given this ideal methodology, how does Weitzman perform his analysis and arrive at his conclusion? To answer this, I turn to an evaluation of the type of model he has used.

The model is outlined in the "Profit Sharing" section of the article and corresponds closely to that used in Weitzman (1985). The emphasis is on the behavior of a monopolistically competitive firm and, in particular, how alternative compensation schemes influence the firm's decisions on output and employment. The basic intuition comes from observing that a monopolist facing a fixed wage might have a tendency to underproduce relative to the social optimum. A profit-sharing scheme lowers the marginal cost of labor and induces the monopolist to move along the demand curve so that output increases and price falls. Introducing a compensation scheme of this type is equivalent to subsidizing the monopolist and then taxing away profits.

This argument is then extended to a model with many monopolistically competitive firms in which each firm faces a downward-sloping demand curve parameterized by the level of autonomous spending, the real money supply and the average of prices charged by the other firms. This latter effect captures the strategic interaction between the firms.

Weitzman characterizes the output and pricing decisions of an individual firm and then looks at a symmetric Nash equilibrium in an economy composed of many such firms. The equilibrium is computed for a given share contract—i.e., a given base wage and a given share parameter. This is called a short-run equilibrium since the parameters of the compensation scheme are taken as independent of the values of the exogenous variables describing the state of the economy. The equilibrium is then compared to one in which workers are paid a constant wage (i.e., the share parameter is set at zero).

As I think is now well understood, an appropriately chosen share contract can generate incentives for the economy to operate at or near full employment even in the short run. If the base wage level is set sufficiently low, firms will always have an incentive to expand their production and are only inhibited from doing so by the presence of economywide employment constraints. Hence for small fluctuations in the exogenous components of demand, employment and output will not fluctuate. One interesting property of this short-run equilibrium is that the share parameter does not influence the level of prices or activity in the economy. Instead, it is the level of the base wage alone that determines the equilibrium. As an aside, it should be noted that if profit sharing is replaced with revenue sharing, the share parameter does enter into the equilibrium since the share contract is now similar to a tax on revenues rather than a profits tax.

This short-run equilibrium is contrasted with a long-run equilibrium in which the parameters of the share contract are determined in a competitive labor market. As argued in Weitzman (1983, 1985), the equilibrium of the model is independent of the way in which labor services are traded. That is, the total payment made to workers is independent of how offers to workers are quoted and the labor market clears at the same level of compensation and employment regardless of the system. Hence the wage and share system have identical long-run equilibria.

I must admit that I have never fully understood this equivalence in a world of uncertainty since the contracts do have radically different implications for the sharing of risk. As best as I can tell, Weitzman chooses to ignore uncertainty in describing the long-run equilibrium and then views short-run deviations as unanticipated shocks in a certain world.

Suppose, though, that we accept the long-run equivalence of these two compensation systems. Weitzman's main point is that the short-run response of the economy to unanticipated shocks is influenced by the choice of compensation scheme in an important way. Since the introduction of the share contract permits firms to pay low base wages, the economy remains close to full employment even in the presence of adverse demand shocks. Hence, Weitzman argues, it is socially desirable for agents to trade labor services in this fashion.

With this structure in mind, we can contrast the argument for the share economy with the methodology outlined earlier. I think this is important not because all theoretical exercises must be performed in a particular way but because of the fear that inconsistencies may be introduced by not following the procedure outlined earlier.

First, with regard to the statement of the decentralized solutions, the model Weitzman develops provides considerable insight into the prod-

uct-market behavior of monopolistically competitive firms.[1] However, the development of labor-market behavior is relatively incomplete. This is an important issue since we know from other work in this area that labor-market behavior tends to drive product-market behavior.

Weitzman takes as a benchmark a wage system in which the wage is predetermined and firms are given the latitude of selecting employment levels. This generates some undesirable behavior of the economy (such as inefficiently low levels of output and employment) in the short run. However, the real source of this inefficiency is never made clear. The model contains three deviations from the Arrow-Debreu model. First, there is the absence of perfect competition in product markets. Second, there is the inflexibility of wages. Third, there is a nonconvexity in the production function. Which of these changes is the source of the problem here? Simply put, what is wrong with this economy?

The article focuses mainly on the stickiness of wages as the source of the problem. The structure of technology and preferences coupled with the monopolistically competitive product markets then creates price inflexibilities. Hence the model without share contracts operates as a traditional Keynesian fix-price model with its well-known inefficiencies, multipliers, etc. One is led to wonder whether share contracts simply reintroduce the wage flexibility arbitrarily assumed away at the start of the analysis.

To answer this point directly requires the formulation of a model predicting these wage inflexibilities or strong empirical evidence of their existence. Weitzman does not supply either of these pieces of the argument. Instead he appeals to a general consensus that the wage system is a good representation of the common form of labor exchange. I think this is unfortunate for a couple of reasons.

First, I am not certain there really is a general consensus that the wage system typifies labor arrangements. Models of this type have the strong empirical prediction that real wages should be countercyclical. My understanding of the empirical evidence is that this prediction is not obviously consistent with the data.[2] Furthermore, as I will discuss in a moment, there is a lack of theoretical support for the wage system as an optimal labor contract. Simply put, the wage system is a suboptimal private contract. Hence, why should we be interested in the social inefficiencies that such a compensation system produces?

Second, the theoretical argument for the wage system is needed to be

1. Akerlof and Yellen (1985), Cooper (1985), Hart (1982), Heller (1984), Roberts (1984) and Weitzman (1982) all stress the macroeconomic consequences of strategic product market behavior.
2. See, for example, Geary and Kennan (1982) and Bils (1985).

sure that the environment in which agents interact is modeled properly in the welfare analysis. Let me illustrate this point in two ways. Suppose that the argument for the wage rigidity stems from an insurance story along the line told by Azariadis (1975), Baily (1974) and others. If so, then we need to keep in mind the fact that risk sharing is important in calculating the costs and benefits of the share system. The share system is not privately optimal because it forces workers to bear too much risk. To show that the share system may be socially desirable requires proof that in equilibrium workers can be compensated for the extra risk they bear.

The insurance argument alone does not deliver the full features of Weitzman's wage system. As is well known, the contracting model does not predict that employment will lie along the firm's demand curve. Instead, terms of compensation and employment should be negotiated separately. Hence, the problem that Weitzman sees in the wage system stems jointly from the rigidity of wages and the fact that firms choose employment levels.

There is a class of contracting models in which the firm is given the latitude to select employment levels. This arises in a setting in which the firm is better informed than workers about current demand or technological conditions. Unfortunately, this class of models will not generally predict fixed wages. More important, though, the presence of this asymmetric information may itself lead to problems with implementation of a share system in which compensation depends on profits.

My point is that it is important to specify the environment (such as attitudes toward risk and the information structure) which generates a problem as we attempt to find solutions to that problem. Otherwise, we face the danger that we may miss some costs of the solution or, worse, it may not be feasible.

The article also does not provide a full analysis of the planner's problem. That is, the welfare criterion is never made explicit and there is no consideration of alternatives to share contracts within a common environment. I found the discussion of alternatives such as TIPs, worker-managed firms, and so on, helpful but not convincing.

So my overall view of this line of research is that its main theme is very important and very interesting. Nonetheless, the models used thus far appear to be less than convincing relative to the enticing stories that accompany Weitzman's work. I think that a more specific statement about the source of the inefficiencies in the private labor markets needs to be provided as well as a more precise statement of the costs and benefits of introducing the share system.

Since it is easy to be critical and harder to be constructive, I will offer some specific suggestions. The most pressing issue is to carefully in-

corporate labor-market behavior into the monopolistically competitive economy outlined in the article. We know from the work of Hart (1982) that the structure of labor markets can both create and cure many ills in this class of models. The point is to determine whether optimal labor arrangements (as opposed to the wage system) can lead to interesting social inefficiencies.

This model of the labor market would then provide the basis for the welfare analysis to follow. That is, the union's objective function would be carefully specified so that trade-offs between types of workers (such as issues of seniority) could be addressed. This analysis of the labor market would also be a vehicle for making the source of the externalities very explicit.

In light of recent attempts to understand macroeconomic inefficiencies from the perspective of labor contracting theories, developing such a model will not be an easy task. Further, we should remember that the type of model that Weitzman outlines has a very different form of product-market behavior than that found in the partial equilibrium contracting models. This interaction between labor contracts and strategic product-market behavior is an important research area. Depending on the level of union representation, I believe it is possible to develop a model in which privately optimal labor arrangements are socially inefficient. Weitzman's arguments may then apply to this setting.

I also think that some interesting questions about the level of union representation and negotiation would emerge from such an exercise as a by-product. That is, one could investigate the implications of negotiations at the firm level, the industry level, or the aggregate level for the types of externalities that Weitzman alludes to in his discussion.

Besides these general thoughts on the model Weitzman uses in this and related research, I want to offer other comments on some specific points raised in the text. First, in the question and answer section, Weitzman addresses the allocation of risks by asking whether or not the share system provides socially inefficient risk sharing. In a related comment, he argues that the fixed-wage system provides good insurance only for senior workers who face no employment risk. Leaving the important question of severance pay aside, it is still the case that risk-averse junior workers facing employment risk will prefer that their wages be stabilized. As I stated earlier, the problem with this wage system is not its incomplete insurance over employment risk alone but that firms have discretion over terms of employment as well. This implies that wage-setting practices have an influence over both insurance and employment incentives.

One way to view Weitzman's argument is that private contracts lean too

far in the direction of insurance and neglect the external effects of employment practices. Share contracts provide better social incentives at the cost of less insurance. So what is the best balance between insurance and incentives? This depends on the attitudes toward risk of the agents in the economy and the nature of this externality in the system.

Also, we see that individual worker-firm pairs will have an incentive to deviate from the share system to avoid the privately inefficient allocation of risks imposed by the government. Hence, the tax and subsidy system used to induce the adoption of share contracts needs to reflect these private gains from deviating from the government's plan. I am not convinced that all of these costs have been appropriately included in the arguments for adopting a share system.

My second comment stems from work on moral hazard problems within the firm—a topic addressed in Lawrence Katz's article. In the presence of internal incentive problems, firms have a private incentive to adopt compensation schemes that will induce their workers not to shirk. These include elaborate systems of bonuses, tournaments, and the like. In some settings, these schemes may produce something that looks quite close to a profit-sharing system. In fact, Weitzman observes that a significant number of firms in the United States have adopted such schemes.

If so, is this evidence that we are moving closer to a share system? I think not. The adoption of these schemes by private agents reflects their own private costs and benefits from trading off insurance for incentives. The crux of Weitzman's view, at least as I understand it, is that there is an externality that is not internalized by individual agents establishing terms of employment.[3] Hence the movement toward share contracts by these agents is presumably still insufficient.

Third, I want to comment on the point I raised earlier about whether a share system is simply a way to reintroduce wage flexibility into a model in which wages were arbitrarily fixed at the start. Weitzman argues that the share system is not a disguised form of wage flexibility since workers' pay exceeds the marginal revenue product of workers' labor. Furthermore, he points out that the share system also has some built-in rigidities in that the base wage and the share coefficient are not state dependent. With profit sharing, the marginal decisions are based on the level of the base wage and are independent of the share parameter. The point is then to create incentives by selecting the correct base wage and then using the share parameter to redistribute income. As far as I can see, the equilibrium is equivalent to one with flexible wages coupled with nondistortionary redistributions of firm profits.

3. Cooper (1985) attempts to model this externality explicitly.

Finally, I would like to say a few words on the case of Japan. There are really two important points in this section. First, is Japan an example of a share economy at work? Second, has the Japanese compensation system with its bonus payments contributed to Japan's macroeconomic performance?

To determine whether or not Japan operates as a share system, Weitzman uses aggregate data on wages, bonuses and profits. Regression results of bonuses relative to wages on deviations of profits from trend are reported. Weitzman finds a significant positive correlation between these variables.

The specification of this equation is somewhat difficult to reconcile with the theoretical model outlined in the article. In particular, the specification includes costs of adjustment and the regression of changes in the bonus/wage ratio on the level of profits.

Even if we determine that bonuses do respond to profits, is this evidence of a share system at work? One can imagine a bargaining setting in which total compensation reflects anticipated profits for the near future. This payment may be reflected in increased bonuses over the next year which, on average, will be correlated with the higher profits of firms. However, this correlation is not really evidence that bonuses respond to unforeseen economic circumstances as is required of a share system. It would be interesting to see whether or not bonuses respond to unanticipated profits.

Weitzman also argues that base wages are independent of economic conditions. I presume that these results would imply that compensation is also sensitive to profits. Is this peculiar to Japan? It would be interesting to investigate whether the U.S. data exhibit similar correlations.[4] This would help us know whether these correlations are a distinguishing feature of a share system.

More important, though, is the question of whether the bonus system has significant macroeconomic implications. Comparing Japan to other OECD countries may indicate that Japan is different but does not tell us why. Are the time series for Japan comparable to those that would be generated by a share economy? It might be useful to carefully write down a share economy and perform some of these comparative dynamic exercises.

One way to investigate the influence of bonuses on employment and

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4. I have attempted this exercise by looking at U.S. data on real profits and real average weekly earnings in the manufacturing sector for the years 1963–1984. Using first differences of these variables, there appears to be a strong correlation between changes in profits and changes in wages. Nonetheless, one would not argue that the United States is a share system.

output would be to look at disaggregated data. If there are significant differences across industries in their use of bonuses, then perhaps we can gain some insights into the importance of the bonus system in regard to fluctuations.

I find this paper, like others Weitzman has written on this topic, very stimulating. As I have tried to argue, I am not convinced that we have yet answered the basic question of whether or not privately optimal labor contracts are responsible for our macroeconomic problems. Without an answer to this question, I don't see that we are in a position to advocate the adoption of alternative compensation schemes on a national basis. Nonetheless, these issues are yet to be fully addressed and I hope others will be persuaded to join in the search for answers.

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Discussion

In replying to Russell Cooper, Weitzman agreed that it would indeed be desirable to build a general model from which both the wage system and

profit sharing can be derived, but that the task is very difficult, and that consideration of the profit-sharing system cannot wait for that. The effects of profit sharing on the natural rate of unemployment would depend on the underlying causes of normal unemployment, though he speculated that profit sharing will never produce a higher natural rate than the wage system. Profit sharing will lower the natural unemployment rate in models where sector-specific shocks, or insider-outsider distinctions, or inertia, drive the unemployment rate.

He did not think the analogy of labor unemployment under profit sharing with unemployment of capital at present, when capital receives 100 percent of profits, was relevant. Capital is often unemployed despite receiving 100 percent of profits because there are fixed coefficients in the short run. This explanation did not satisfy Lawrence Summers, who did not see why labor under pure profit sharing would be in any different position than capital at present. He suspected that who gets the residual claim in the economy is very important.

Robert Hall questioned Weitzman's theme, that the optimal system fully stabilizes employment in the face of shocks. Stabilization can go too far. Sometimes shocks (especially idiosyncratic ones) call for changes in employment.

The equivalence of the Japanese bonus system with profit sharing was doubted by Takatoshi Ito. The bonus is usually negotiated, expected, and stable, and does not show much cyclical fluctuation. He also commented that the use of overtime work rather than the bonus system was responsible for the stability of Japanese employment.

Arnold Kling pointed out a cost of the share economy, which is ignored in Weitzman's article. Since pay now depends on the profitability of the firm, workers will have to obtain far more information about the firm for which they choose to work, both in looking for a job and after they take one, than they do at present. This is a cost for the worker that is absent in the wage system.

Given that the industrial wage structure has existed for two centuries, Robert Gordon wondered why profit sharing had not been introduced earlier if it was thought to be such a good idea. He saw it as having several disadvantages. First, its introduction can be contrary to the senior worker's vested interest, which is the reason the two-tiered system rather than profit sharing has become popular. Second, in the share economy, a worker's pay is tied to his own firm. This may lower the welfare of the worker compared with, for example, wage indexation to nominal GNP.

Weitzman concluded the discussion by answering Summers. He commented that it is not clear that capital in the present system has the same characteristics as labor would under profit sharing. At present labor can

in some sense be thought of as the residual claimant, with some workers taking their share in the form of unemployment. Other comments, he thought, had failed to distinguish between private and social optimality. He stressed that the issue is social rather than private optimality. It is true that there are strong private incentives for the continuation of the wage system, but that does not necessarily make it socially optimal—and this is the issue he is addressing.