RELATIVE WAGES, EFFICIENCY WAGES, AND
KEYNESIAN UNEMPLOYMENT

Lawrence H. Summers

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ABSTRACT

While modern economic theorists have produced a variety of
explanations for the failure of wages to fall in the face of
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in most contemporary discussions. This short paper suggests that
relative wage theories in which workers' productivity depends
primarily on their relative wage provide the best available apparatus
for understanding actual unemployment and its fluctuations. Such
theories are very closely related to the efficiency wage theories that
have received widespread attention in recent years.

Lawrence H. Summers
Department of Economics
Harvard University
Cambridge, MA 02138

Keynes's General Theory in explaining involuntary unemployment advanced the idea that "any individual or group of individuals, who consent to a reduction of money wages relatively to others will suffer a relative reduction in real wages, which is sufficient justification for them to resist it. On the other hand, it would be impracticable to resist every reduction of real wages due to changes in the purchasing power of money, which affects all workers alike." (p.14) While modern economic theorists have produced a variety of explanations for the failure of wages to fall in the face of unemployment, Keynes emphasis on relative wages has not been reflected in most contemporary discussions. This short paper suggests that relative wage theories in which workers' productivity depends primarily on their relative wage provide the best available apparatus for understanding actual unemployment and its fluctuations. Such theories are very closely related to the efficiency wage theories that have received widespread attention in recent years.

Section I motivates and then lays out a simple relative wage model describing the determination of equilibrium unemployment and highlights the fragility of the equilibria that are likely to result when firms are concerned about their relative wage. Section II develops the close relationship between relative wage models and models that stress the role of insider power in understanding unemployment. Section III shows how efficiency wage models can be extended to account for cyclical unemployment fluctuations once the role of relative wages in influencing worker productivity is recognized. Section IV offers some concluding observations.

I. Relative Wages and Equilibrium Unemployment

For simplicity, consider a labor market in which workers and jobs are homogeneous. In addition to the virtue of tractability, these assumptions remove many of the ambiguities associated with the concept of involuntary unemployment. If the labor market were perfectly competitive and free of information problems, the demand and supply of labor would be equated. In the competitive equilibrium, all firms would pay the prevailing wage, and any worker would be able to immediately obtain work at this wage.

This very simple perfect competition model offers a manifestly inadequate account of the labor markets. Firms do not act as if they face perfectly elastic labor-supply schedules. Small changes in wages do not produce infinite changes in the available supply of labor. In fact, firms focus on variables other than the quantity of labor available to them in setting wages. A large institutional literature has documented that firms go to considerable expense to gain information in order to set an appropriate wage rate relative to other firms in their labor market. In Chicago alone, more than 100 surveys of the wages paid to clerical workers were performed in a single year, while firms went to relatively little expense to determine how many clerical workers were unemployed. Most strikingly, even in settings where unemployment is high, firms do not cut wages and sometimes even raise them.

The natural way for an economist to account for the observation that firms sometimes raise wages even when they are not having trouble staffing their workplace is to postulate that reducing wages in the face of unemployment would reduce profits. Profits may fall when wages are reduced, if reducing wages influences productivity by affecting workers' effort, or by raising the firm's

costs of recruiting, training and retaining its labor force. This is the central theme of the burgeoning efficiency literature (surveyed by Stiglitz (1986) and Katz (1986)) which spells out a variety of mechanisms linking the wages a firm pays to the productivity of its workforce. While the point is rarely emphasized, most efficiency wage arguments suggest that rather than depending on absolute wages, productivity depends on the relative attractiveness of opportunities inside and outside the firm. Opportunites outside the firm in turn depend on both the wages paid by other firms and the rate of unemployment. Think about stories based on turnover, recruiting, workers' perceptions of what is fair as examples.

A simple functional form allowing for the possibility that increasing relative wages raises productivity holds that:[1]

(1) $\theta = (w-x)^{\alpha}$ $0 \leq \alpha \leq 1$

where θ measures the effort put forth by the representative worker, x reflects its workers' opportunities in a sense defined precisely below and α measures the productivity-enhancing effects of paying higher wages. If $\alpha=0$, efficiency wage considerations are absent. As α increases, they become more important.

The representative firm's problem is to choose a level of wages that minimizes costs per unit of effective labor input, w/θ. Differentiating (1) yields the result:

(2) $w^{*} = x/(1-\alpha)$

which implies that the firm pays workers their opportunity cost if efficiency wage considerations are absent but generally pays a premium whose magnitude depends on the the size of α.

Characterizing market equilibrium requires a description of how x is

determined. A convenient functional form capturing the idea that outside

opportunities depend both on wages paid by other firms and on unemployment is:

(3) $x=w(1-(1-b)u)$

where u is the unemployment rate, w is the average wage paid by other firms, and

b reflects their relative importance in determining a workers' outside

opportunities. The value of b in a fully worked out model would depend

positively on the utility of leisure, the value of unemployment benefits, and

negatively on the duration of unemployment.

Substituting (3) into (2) and requiring that w=w, since all firms are

identical, we obtain a very simple expression for the market equilibrium

unemployment rate:

(4) $u=\alpha/(1-b)$

Equation (4) indicates that the equilibrium unemployment rate depends positively

on the size of the productivity-enhancing effects of wage increases as reflected

in α, and on the attractiveness of unemployment as reflected in b. Notice that

only in the special and plausible case where $\alpha=0$ will there be no unemployment

in equilibrium. Notice that the functional form used here has the special and

attractive property that the equilibrium level of unemployment does not depend

at all on the form of the labor-demand schedule. The labor-demand curve only

determines the level of wages. This is an attractive property of the model. It

is striking that real wages have doubled several times over the last century

without having a large impact on average unemployment rates.

Substituting plausible parameter values into equation (4), it is clear

that only small efficiency wage effects are needed to account for observed

levels of unemployment. Even if b=0, a productivity-relative wage elasticity,

α, of only .06 is sufficient to rationalize a 6 percent unemployment rate. For larger values of b, even smaller efficiency wage effects are sufficient to rationalize observed levels of unemployment. Furthermore, the image of unemployment suggested by the model also accords with observation in two important respects.

First, the unemployment generated here is involuntary and socially costly. In complex models it is sometimes difficult to make the concept of involuntary unemployment operational. But here its meaning is clear enough. All jobs and workers are identical. All workers want jobs at the prevailing wages but only some workers can get them. Furthermore, since workers and firms are identical, the unemployment modelled here does not arise from desirable reallocations of labor power to its highest value use. In this sense, it is consistent with observations highlighting the concentration of unemployment among a small segment of the population that experiences long unemployment durations.

Second, the model is suggestive regarding differences between demographic groups in unemployment rates. Those who value leisure highly and whose turnover is quick are most sensitive to relative wages and will have the highest unemployment rates. Think of teenagers as an obvious example. Alternatively, think of construction workers who can easily move from job to job.

The determination of equilibrium unemployment in a general relative wage model is depicted in Figure 1.[2] The equilibrium unemployment rate has the special property that the representative firm optimizes by paying the prevailing wage. At lower unemployment rates, the representative firm wants to pay a wage that exceeds that paid by other firms. At higher unemployment rates, it desires

to pay a wage that is lower than the wage paid by other firms. Notice that as long as the representative firm would like to pay a higher than average wage in the face of completely full employment, the market equilibrium unemployment rate will be positive.

Looking at Figure 1, it is clear that if the two schedules intersect at a narrow angle, small movements in either schedule will have a large effect on equilibrium unemployment. For instance in the example cited above, a relatively modest increase in the value of the "unemployment benefit," b from .5 to .6 would be sufficient to increase the unemployment rate from 6 to 7.5 percent as the WW schedule shifted upwards. The sensitivity of the unemployment to small shocks is a consequence of the relative wage model's basic logic. Developments that cause some firms to raise wages have their effects magnified because each firm's optimal wage is a postive function of average wages.

The principle, that concerns with conformity can lead to volatility and instability, is a very general one. It must help to explain why the demand for hula-hoops or Rubik's cube is so much more volatile than the demand for more standard products whose value depends less on whether they are used by others. In the next two sections, I argue that conformity effects can help to explain why structural and cyclical unemployment vary so widely.

II. Relative Wages, Insider Power and Structural Unemployment

The preceding discussion has maintained the assumption that firms are able to set wages in order to maximize their profits. A major theme of recent discussions of unemployment particularly in the European context is the idea

that wages are set by bargaining, implicit or explicit, between firms and
workers. Such bargaining obviously occurs in union contexts. Lindbeck and
Snower's (1987) insider-outsider theories suggest that bargaining may be
relevant in non-union settings as well. Lindbeck and Snower treat insider-
outsider theories as an alternative to efficiency wage theories in explaining
unemployment.

From the perspective of the model presented in the first section, it seems
more natural to regard them as complementary, mutually reinforcing explanations
for unemployment. The relative and efficiency wage considerations stresed in
the previous section magnify greatly any effects of bargaining power in two
respects. First, in the model developed above, firms reach an interior optimum
in setting wages. It is a property of such an optimum that sufficiently small
changes in wages have no effect on profits, and larger changes in wages have
only second-order effects on profits. This means that in an efficiency wage
environment, firms that are forced to pay their workers premium wages suffer
only second order losses. In almost any plausible bargaining framework, this
makes it easier for workers to extract concessions.[3]

Second, a key aspect of any relative wage theory is that the optimal wage
for a firm to pay depends positively on the wages paid by other firms. This
means that when insiders raise wages at some firms, the effect spills over
leading other firms to raise their wages. Katz and Dickens' (1987) survey of
the literature reports some evidence that, contrary to the predictions of at
least simple competitive theories, the presence of unions in an industry raises
the wages of both union and non-union workers. Similarly, it is often argued
that increases in the minimum wage lead to changes in other wages as well in

order to preserve relativities. Relative wage effects on productivity can explain why insider power can create unemployment, even if there are some freely competitive sectors of the economy.

These two points can be illustrated by a simple calculation. Imagine that insiders at a fraction β of all firms have the power to extract a premium of μ over wages at unorganzied firms. Then the equilibrium unemployment rate may be calculated by solving the equations:

(5) $w^o = (1+\mu)w^n$

(6) $w^o = (\beta w^n + (1-\beta)w^o)(1-(1-b)u)/(1-\alpha)$

where w^o and w^n represent respectively the wages in the organized and non-organized sectors. This yields:

(7) $u = (\alpha + \mu\beta)/(1-b)(1+\mu\beta)$

Equilibrium unemployment increases with the size of the organized sector and with the size of the wage premiums it can extract. The results of inserting plausible parameter values are striking. Assume, as before, that $\alpha = .06$ and $b = .0$. Then, if μ and β are each equal to .15, insider power will increase the unemployment rate from 6 percent to 8.1 percent. Yet, union firms incur labor costs that are only 6 percent greater than in non-unionized firms because of the productivity-enhancing effects of wage premia.

The role of relative wages explains why unemployment outcomes are so sensitive to small amounts of insider power. This comports with the common observation that "corporatist" countries, where labor bargaining is centralized, tend to have lower average rates of unemployment than other nations where bargaining is decentralized.

III. Cyclical Unemployment

The basic problem in understanding cyclical fluctuations involves isolating the impulses and propagation mechanisms that cause the economy to fluctuate. The relative wage approach to understanding unemployment developed here suggests propagation effects are likely to be strong, and so only small impulses are necessary to account for observed cyclical fluctuations. In particular, the equilibria described in Figure 1 are "fragile,"-- that is, very sensitive to small disturbances. Small real shocks may have large effects particularly if they are transitory and so do not affect workers' perception of "x" representing outside opportunities.

The relative wage model here suggests that unemployment will be very sensitive to perception errors that might plausibly follow changes in monetary policies. Essentially misperceptions by workers of average wages shift the EE curve in Figure 1 upwards. If relative wage effects are strong, even small misperceptions can have large effects. Imagine that the money stock is reduced. but firms believe that the workers who still have jobs do not yet recognize that equilibrum wages have declined. Then it would not be profitable for them to reduce wages to the level that would be an equilibrium if workers did not misperceive their opportunities. Furthermore, firms that recognized that other firms were not reducing their wages to the new equilibrium level would recognize that they should not either, even if their workers were fully informed.

This misperceptions story is reinforced by two further considerations which distinguish it sharply from misperception interpretations of business cycles put forward by classical theorists. First, the central problem here is one of

coordination. Notice that it is sufficient to prevent reattainment of equilibrium following a shock, for some firms to suspect that some firms will suspect that some firms will suspect that...either workers or some firms... will not assume that the new equilibrium is to be attained immediately. The informational requirement for the costless attainment of a new equilibrium is much more than individual rationality--it is common knowledge that all individuals will be rational.

Second, the plausibility of rapid adjustment is further undercut by the observation that, at least in the face of an adverse shock, workers who are perceived as ignorant of the new equilibrium will benefit, in that their wages will not be reduced. This makes it even less likely that transitions between equilibria will occur smoothly. The idea of persistent misperceptions is supported by evidence. Caskey (1985) demonstrates that inflation was consistently underestimated for ten years during the 1970s and has been consistently overestimated during the 1970s.

The description of wage setting sketched here seems more compelling than the assumption of sticky nominal wages that is contained in "Keynesian" macroeconomics textbooks. Keynesian formulations have been successful in identifying reasons why firms might find it costly or undesirable to vary wages continuously. But most of the reasons they have given for wage rigidity are at least equally plausible as justifications for keeping the level of employment constant and not firing workers during recessions. On the other hand, the misperceptions idea stressed here explains why firms choose to adjust wages slowly and fire workers when adverse shocks come. There is also the further point stressed in some of the implicit contracts literature that layoffs help to

educate workers who have jobs about adverse changes in market conditions.

An analogy developed in Summers (1988b) may be helpful in seeing the point of this section. Daylight savings time is purely a change in the "units" used in measuring time. Yet it clearly has real effects in the sense that stores open at a different time relative to the sunrise because of its existence. Why? Probably because most individuals care much more about being on the same time standard as their neighbors than they care about what that time standard is. Therefore, coordinating actions can succeed in achieving a better outcome in the summertime than the market would generate. Much the same may be true of expansionary policy during recessions.

IV. Conclusions

Unemployment, like cancer, is a multi-faceted phenomenon that comes in many forms. But one would hope that theory could isolate aspects common to different types of unemployment in different places and times. I suspect that recognizing the role of relative wages in influencing workers' performance will help economists in understanding different types of unemployment. Keynes emphasized the volatility associated with situations where people try to guess the guesses of others in financial markets. This essay has tried to argue that the lesson is a general one applying to labor markets as well.

Figure 1
Relative Wages and Equilibrium Unemployment

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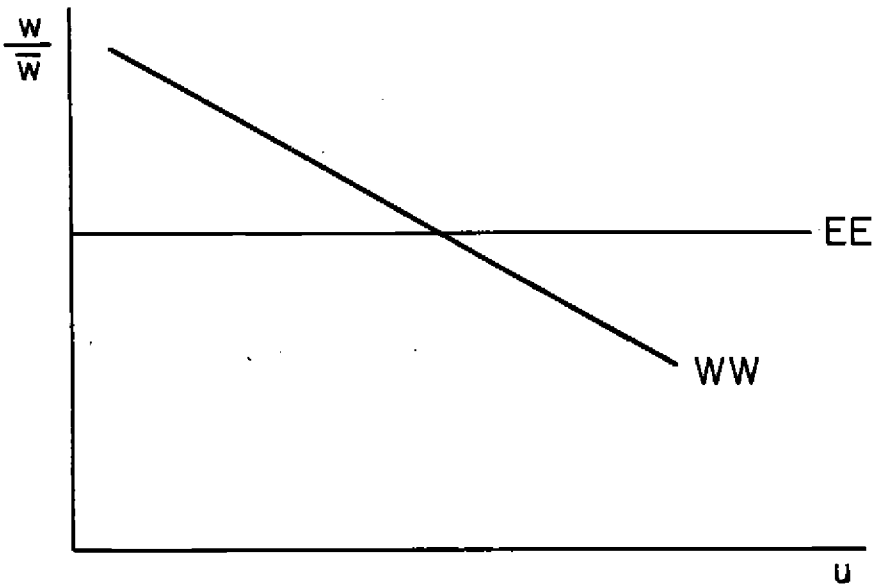
ENDNOTES

1.   There are a wide variety of devices discussed in the efficiency wage
literature that firms can use to enhance workers' productivity without
increasing their wages. In considering the effects of wage changes, I assume
that firms have already optimized on all these margins.

2.   A very similar discussion of the determination of the "natural rate of
unemployment" is presented in Johnson and Layard (1986).

3.   The results of Abowd (1987) corroborate the efficiency wage hypothesis in
this respect. Taking a long horizon into consideration, Abowd finds that
surprise increases in wages resulting from collective bargaining agreements
reduce firms' market values by much less than the projected increase in labor
costs.

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