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The Worker's Fallback Position and Nominal Wage Movements: The U. S. Wage Slowdown in the 1980s

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I. Introduction

The wage inflation processes of the United States have sometimes perplexed economists. The most recent example was the wage slowdown in the 1980s. That was considered as perplexing not because the magnitude of the wage slowdown was especially large but because it was larger than would be expected by the traditional wage change equations. In econometric terms, the wage inflation process in the 1980s has shown large negative autocorrelated residuals (i.e.,overprediction). This unexpected wage development

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in the 1980s has of course stimulated new theoretical explanations and new empirical equations.

The wage behaviors in most of the 1970s were another anomaly at that time, when wage inflations were underpredicted by the traditional equations. What was called as "wage explosion" might in part reflect this unexpected magnitude of wage inflation. Even incorporating the impacts of supply shocks, much discussed culprits, the wage movements were not still fully explained.

This paper is an attempt to account for these seemingly irregular wage developments, with special attention to the wage disinflation in the 1980s. Our approach is that the failure of many wage change equations to capture those episodes was largely attributable to the omission of an important dimension in the wage determination process. According to a variant of the efficiency wage models, the worker's fallback position, i.e., replacement incomes available to the unemployed workers, plays a crucial role in the wage determination process. Therefore, the measures of labor market conditions which have been included in the wage change equations in one form or another need to be supplemented by the fallback position of workers. If the worker's fallback position is properly taken into account, we argue, most of the apparent changes in the wage behaviors can be explained in an unified way without recourse to ad hoc presumptions.

This paper is organized as follows. Section II critically reviews Perry's and Mitchell's wage norm explanations for the wage slowdown and then presents our theoretical framework. Section III first measures the worker's fallback position and provides our econometric results. Section IV concludes.

II. Theoretical Considerations

1. The Wage Norm Explanations

The wage deceleration of the 1980s has been most influentially explained by the so-called wage norm theories. Perry(1983, 1986) and Mitchell (1985, 1986) argued that the wage norm shifted downward substantially in the early 1980s and that its shift produced the observed wage deceleration.

Perry (1980) defines the wage norm as the standard rate of nominal wage increase expected or targeted by those involved in the wage determination process. The wage norm refers to the trend in wage behaviors, which is distinct from cyclical effects on wages. Perry conceives changes in the wage norm as discontinuous. That is, the wage norm is influenced by actual wage developments but so to the extent that they are sustained for extended periods of time. A temporary deviation of actual wage developments from the wage norm does not lead to a shift in the wage norm. Perry argues that the early 1970s, for example, experienced an upward shift in the wage norm in response to the sustained actual wage inflation in the preceding years which was generated by the sustained strong labor market conditions. The wage norm is also affected by sustained exogenous price changes. The oil shocks in the 1970s shifted up the wage norm.

Perry related shifts in the wage norm mainly to actual wage and price developments. If changes in the wage norm are simply adaptive but discontinuous responses to actual past experiences, however, it becomes hard to explain the wage deceleration, a shift-down of the wage norm, in the early 1980s. To follow Perry's argument the second oil shock of 1979~1980 would have drifted up the wage norm in the early 1980s. As for the wage slowdown in the 1980s, Perry (1983, 1986) added the role of extreme economic conditions in shifting down the wage norm. But his reformulation is not easily reconcilable with the fact that the wage slowdown persisted into the middle of the 1980s when the economy was well in the process of recovery.

Mitchell, in contrast to Perry, puts weight on changes in the institutional and political environment. These changes impinge upon the balance of power between relevant parties in nominal wage determination. Mitchell, focusing on the union wage setting, explicitly writes: "the norm concept suggests that shifts in the balance between organized labor and management – sometimes supported by the external legal and political environment – play an important role in union wage outcomes."(1986, p. 250) Mitchell (and similarly Wachter and Carter, 1989) explains the wage slowdown in the 1980s in terms of the wage norm shift engendered by the shifting balance of power between capital and labor. This shift was reflected by the proliferation of concession bargainings in the union sector, which began in the early 1980s in some hardest hit sectors and spread into other sectors through the middle of the decade. The changes in the institutional and political environment that allegedly led to the wage norm shift-down include the decline in union representation in the work force, decreased strike activities, the changes in political and legal climate against organized labor, hardening management attitude toward labor, and the widening of the union-nonunion wage differential.

Mitchell's wage norm theory is not without problems, although the concept of the wage norm shift being affected by the shifting balance of power between capital and labor is appealing. The main theoretical problem with Mitchell's theory is that the mechanism through which the wage norm shifts is unclear. Especially deficient are convincing explanations as to how changes in the institutional environment were brought about and how those changes affected the wage norm. For example, the widening union-nonunion wage differential is supposed to reverse once it is gone too far, but without an adequate theoretical rationale. The decline in strike activities and management hardening toward labor are unexplained and treated as exogenous.[1] In short, the determinants of the balance of power between capital and labor, the key element in the theory, lack adequate theoretical treatment.

Empirically, most of the important variables are not easily quantifiable and thus leave room for arbitrary interpretation. Both Perry and Mitchell interpret the change in the constant term in traditional wage change equations as the wage norm shift. It is clear that this procedure cannot avoid its ad hoc atheoretical nature: any change in the constant term which eludes explicit causal explanation can be interpreted as a wage norm change. If the theory is empirically executed in this evasive way. it obviously loses much of its explanatory power, let alone its predictive power.

This paper also emphasizes the relative power of capital and labor. In this vein it is related to Mitchell's wage norm formulation. But it will be different from Mitchell's in that a determinant of the relative power of workers and employers is taken into explicit account, enabling much of shifting relative power to be endogenized.

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1) The incidence of strike activities was found by Schor and Bowles(1987) to be significantly influenced by the movements of the cost of job loss. It is therefore quite unsatisfactory to treat the decline in strike incidence as an exogenous determinant of the wage slowdown.

2. The Theoretical Framework

The Phillips curve hypothesis as rationalized within a bargaining framework (for example, Desai, 1973) took the unemployment rate as a proxy for the relative power of workers and employers and hence the degree of wage pressures. However, if the unemployment rate is to serve as a good measure of the relative power, workers should have no alternative income sources available when they get unemployed. But in modern welfare states the unemployed, provided with various income-maintaining or income-replacing welfare benefits, have been to a certain degree cushioned from the impacts of unemployment. Under this circumstance, the unemployment rate is only a partial measure of the relative power of workers and employers and needs to be supplemented by a measure of the degree of income protection for the unemployed.

The recent labor discipline model, popularly called "shirking model" among the efficiency wage models, places this issue at the centerstage in the nonunion setting. The model is based on the premise that the effort intensity of workers cannot be contractually enforced. In the absence of a third-party enforcement, the effort intensity of workers is a central contested variable at the workplace and thus it has to be endogenously enforced by employers, who will implement various incentive and dis-incentive mechanisms.

The model's main thrust is that the effort intensity depends to a crucial extent upon the costs to be imposed on the worker when he is dismissed. The cost of dismissal or job loss, defined as the difference between the worker's current wage and expected replacement income if he is dismissed, should be positive, of course, in order for dismissal to be a credible threat. The threat of dismissal may well be the only effective weapon in the hands of employers in regulating workers' behaviors in a capitalist economy (see, for example, Shapiro and Stiglitz, 1984; Bowles, 1985). It is intuitively obvious that the more the cost of job loss is, the more effective the threat of dismissal will be and hence the more work efforts the workers will exert. The cost of job loss is, therefore, an index for the relative power of workers and employers.

Following Bowles (1985) and Summers (1988), the effort intensity can be expressed as follows (this effort intensity function can be formally derived from the worker's intertemporal framework as in Shim (1991)):

(1) $E = E(L),\ E'(L) > 0,\ E''(L) < 0$

(2) $L = w - [(1-U)w^a + Uw^s]$

Here, L is the cost of job loss, the difference between the current wage, w, and the expected replacement income when dismissed, $[(1-U)w^a + Uw^s]$, all in real terms. For the unemployed worker either finds an alternative job at a wage w^a with the probability of $(1-U)$ or remains unemployed and receives his fallback position w^s with the probability of U.[2]

The fallback position, w^s, can be expressed as a fixed fraction of the current wage (recall the fixed replacement rate for unemployment insurance benefits): $w^2 = Hw,\ 0 < H < 1$. H will be called as the fallback position ratio. The identity (2) is now altered as: $L = (1-UH)w - (1-U)w^a$.

The problem for the firm is to maximize its profits subject to its production function and effort intensity function. Following a usual assumption that the nonlabor inputs do not affect the labor process, the firm's profit maximization problem is first to minimize the cost of a unit of work effort, or, to minimize w/E(L). The first-order condition for a cost minimum (called as the Solow condition) is that the average work effort per wage is equal to the marginal effect of an increase in the wage on work effort:

(3) $(1-UH)E'(L) = E(L)/w$

In economy-wide equilibrium, the current wage will be equal to the alternative wage ($w = w^a$) under the symmetry assumption of homogenous firms and workers. The equilibrium wage will be determined by:

(4) $(1-UH)E'([U(1-H)w]) = E([U(1-H)w])/w$

Total differentiation of (4), provided that the economy is viable such that the effect of a decrease in U on the wage will not be explosive, produces the wage function with the wage negatively related to U and positively related to H.

Note that we have determined the real wage as optimal responses by employers. The

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2) The U may be thought of as the expected duration of unemployment expressed as a fraction of a given period, say, a year.

real wage equation implies that the nominal wage change is a function of the changes in U, H, and expected prices. However, if we take into account the wage-price dynmics as in Blanchard(1986) and Layard et al.(1991), we can easily express the nominal wage change as a function of levels of U and H, and the expected price inflation, which is the Phillips curve equation augmented by H, the fallback position term.

Ⅲ. Econometric Specification and Estimation

1. Measuring the Fallback Position Ratio

Before determining the econometric specification for estimation, it will be necessary to discuss in some depth the construction of H, the fallback position ratio, which is an unfamiliar variable. The fallback position ratio as representing the degree of generosity of social wage programs has been measured in several, but mostly unsatisfactory, ways.

It has been sometimes constructed to include almost all of welfare benefits as well as unemployment benefits. However, most welfare benefits either affect only a minority of workers or are minor in magnitude. For example, the biggest component of welfare benefits is benefits from Aid to Families with Dependent Children(AFDC), whose major recipients are single mothers. Many workers are potentially eligible for food stamps when they lose jobs and their baseline earnings meet some requirements, but food stamps are minor compared to unemployment benefits and data on them are not available before 1962. Therefore, only unemployment benefits will be used in constructing H.

The correct construction of the fallback position ratio should measure the percentage of previous earnings that will be available as unemployment benefits "during the whole duration of unemployment". The ratio can be conceptually decomposed into two separate parts: (i) the percentage of previous earnings unemployment benefits replace when they are available and (ii) the timespan in which unemployment benefits are potentially available.

The first part is called the replacement ratio, the ratio of unemployment benefits to previous earnings. In most states the gross replacement ratio has remained around 0.5 over the period of 1955～1982. However, what counts more for the unemployed is net, after-tax, replacement ratio. Prior to 1979 unemployment benefits were exempt from the federal income tax but since then have been subjected to increasing taxation. The net replacement rates are estimated using plausible estimates of marginal tax rates.[3]

The second part, which we will call as the benefit duration ratio, measures the probability of continuously receiving unemployment benefits during the whole duration of unemployment. The measure is closely related to the availability of extra unemployment benefits beyond regular benefits.

The most important change in the unemployment insurance system was perhaps the introduction of permanent federal-state extended benefits in 1971. They significantly added to regular program benefits when labor market conditions were particularly loose. The extended benefits program was hardest hit when the Reagan administration began to tighten the eligibility criterion for extended benefits. The significant tightening of the trigger system which links the eligibility of extended benefits of each state to its insured unemployment rates, and the elimination of the national trigger system in 1981 made it virtually impossible to receive extended benefits since 1984.

The supplemental unemployment benefits which became available in some emergency cases were also important additions to regular and extended benefits. The most generous of these was the Federal Supplemental Benefits(FSB) program for 1975～1978, which provided for up to 26 additional weeks of benefits to individuals who had exhausted their extended benefits entitlement. The Federal Supplemental Compensation(FSC) program of 1982～1985 was not only less generous with benefit durations but it served primarily to supplant the extended benefits program after substantial reduction of that program rather than to significantly supplement regular and extended benefits, as the FSB program had done. Given that the availability of extended and supplemental benefits was important addition to regular benefits, it should be included in determining the generosity of overall unemployment benefits.

3) The net replacement ratio is defined as gross replacement ratio * (1 + marginal tax rate). We follow the plausible estimates of Corson and Nicholson(1988): the marginal tax rate is 0.2 before 1979 and 0.15 for 1982～1986. It is assumed to be 0.18, an intermediate value for 1979～1981. The marginal tax rate is 0 after 1987 when all benefits became taxable.

The benefit duration ratio can be directly constructed if the probability distribution of unemployment durations is known. Suppose the probability distribution of unemployment durations is given by (UD is the duration of unemployment and T is a random variable):

$$(5)\ F(T) = Prob(UD < T)$$

If every eligible unemployed worker takes up all available unemployment benefits, the benefit duration rate(BDR) will be calculated as:

$$(6)\ BDR = F(T_r) + P(X)[F(T_x x) - F(T_r)] + P(S)[F(T_s) - F(T_x)]$$

where P(X) and P(S) refer to the probability of extended benefits (from Tr to Tx) being available when regular benefits are exhausted and the probability of supplemental benefits (from Tx to Ts) being available when extended benefits are also exhausted, respectively. It is, however, impossible to directly calculate since the probability distribution is hard to estimate. As a roundabout way the benefit duration ratio is approximate to:

$$(7)\ BDR = \frac{\text{Total UI Receivers}}{\text{Job Losers}}$$

$$= \frac{\text{Regular UI Receivers}}{\text{Job Losers}} * (1 + \frac{\text{Extra UI Receivers}}{\text{Regular UI Receivers}})$$

If data on the number of job losers are available, the ratio can be readily calculated. But problems with official data on job losers(see Clark and Summers, 1979) and their unavailability before 1967 prohibits us from so doing. Fortunately, the ratio of extra benefits receivers to regular benefits receivers(that will be called the extra benefit ratio) is available.

The extra benefit ratio turns out to have an econometric advantage over the benefit duration ratio. Because unemployment durations are likely to be highly correlated with labor market conditions, the benefit duration ratio will be also highly correlated with labor market conditions if no extra benefits are available. Using the benefit duration rate together with the labor market condition variable will increase the multi-collinearity problem and unduly reduce the true effects of labor market conditions on the wage change. The extra benefit ratio in effect serves to control for the effects of labor market conditions from the benefit duration ratio.

The above discussion leads us to construct the fallback position ratio as Net Replacement Rate * (1 + Extra Benefit Rate). However, what is complicating is a sudden change in the ratio of the number of persons receiving regular unemployment benefits to the number of the unemployed workers. This ratio showed a steady but only slight decline over the period of 1955～1980, despite an increasing trend in the coverage rate. But the ratio experienced an abrupt decline in the early 1980s. The ratio declined by 16. 2 percentage in 1981 despite an increase in unemployment and continued to decline since then. The average ratio for 1981～1988 dropped by 21 percent compared to the average ratio for 1970～1980. A simple econometric estimation shows that the average ratio for 1981～1988 have dropped by more than 20 percent than would be expected by historical relationships (not shown here).

Its recent abrupt decline was largely due to the decline in the ratio of UI receivers to job losers covered by the UI system, which would be all the more puzzling (see Burtless, 1983; Corson and Nicholson, 1988; Blank and Card, 1991). This decline can only occur due to either tighter eligibility criteria for benefits and/or their stricter enforcement, or a decline in the application rate among eligible job losers. Blank and Card argue that this decline is not attributable to the changes in the eligibility criteria as often conceived but mainly to the rather abrupt decline in the applications for benefits among eligible job losers, while Corson and Nicholson have found some evidence of administrative changes toward tighter eligibility criteria. Many explanations for the decline in application rate have been proposed. They include shifts in the industrial and geographic distribution of unemployment, partial taxation of unemployment benefits, perception of tighter eligibility rules and stricter enforcement, more stigma against receipt of benefits (in fact there was some social climate against "living off the state"), and increasing average duration of unemployment (the last three were suggested in Summers, 1986).

The abrupt decline in the ratio of regular benefits receivers to unemployed workers, as Blank and Card pointed out, remains largely unexplained. However, what is clear is that since 1981 the unemployed workers have suffered from much less income protection, regardless of whether it was due to changes in policies, or social climate, or people's perception. The decline in the ratio is thus incorporated in our measure of the fallback position ratio.

2. Estimation Results

The discussions in Section II lead to the following parsimonious specification for the rate of nominal wage change equation[4]:

$$(8)\ DW(t) = a_0 + a_1U(t\text{-}1) + a_2FBR(t\text{-}1) + a_3y(L)DP(t\text{-}1) + e(t)$$

where DW and DP are logarithmic rates of change of nominal wages and consumer prices, U the labor market variable, FBR the fallback position ratio, and y(L) is a polynomial of the lag operator.

The equation will be estimated with annual data for the period of 1955~1988. Their obvious drawbacks notwithstanding, annual data will be used because the FBR is not readily available on a quarterly basis. We begin with 1955 following usual practices.

Brief discussions of the variables are in order. The dependent variable is the rate of change of hourly earnings, adjusted for interindustry shifts and overtime payments. The variable U, representing the probability of remaining unemployed, is not readily available. In order to ensure comparability with other studies, we will use the most commonly used labor market condition variable, the civilian unemployment rate(UNE). It enters in reciprocal form as a reflection of the postulated non-linearity of the Phillips curve relationship. To minimize a possible simultaneity problem, it is lagged one year. The lagged price inflation term, y(L)DP(t-1), is usually regarded as a reflection of either adaptive price expectations or the inertia in wage-and/or price-settings as a result of implicit and explicit long-term contracts. Since the estimation results are sensitive to the selection of the lag lengths, Akaike's(1969) final prediction error criterion is used to determine the optimal number of lags. According to our search, one-year lag has performed best in almost all equations and hence will be used throughout.

The estimation results are presented as(1-1) in table 1. The coefficients on all independent variables have the expected signs and are statistically significant by usual standards. The adjusted R2 is much higher and the standard error is much lower than those in a

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4) The time series properties of the variables are in dispute(for an excellent survey, see Campbell and Perron, 1991). Tests for unit roots are meaningless with our small sample. We simply assume that all variables are stationary.

traditional equation without the fallback position ratio, (1-2). Although the Durbin-Watson statistic of our equation falls in the indeterminate range, it is much higher than that in (1-2). The traditional equation, which shows an unambiguous sign of autocorrelation, implies obvious misspecification of omission.[5] (A re-estimation of our equation(1-1) correcting for autocorrelation with AR(1) process had marginal effects on the estimates.)

The use of the civilian unemployment rate has been subject to much criticism. To test for the robustness of the results to various measures of labor market conditions, we re-estimated the equation(1-1) employing other frequently used measures of labor market conditions. They are, respectively, the unemployment rate of prime-age(35-44) men (PUN) (to account for changes in the unemployment rate due to changes in the demographic composition of the labor force), the output ratio (OUT) (the ratio of actual to trend GNP), and the ratio of the index of help-wanted advertisings to the number of unemployment (HEL). The PUN enters in reciprocal form. The results (columns 3 to 5) show that the effects of labor market conditions on the wage change are robust to changes in their measures. The coefficients on the FBR are found to be also quite robust to changes in the measures of labor market conditions.

In conformity with some other studies, a dummy variable was introduced to control for the effects of the price controls imposed during the Nixon administration.[6] The Nixon dummy failed to achieve its statistical significance even at 10 percent level of significance (not shown here).

Test for Structural Stability

Before investigating the forecasting performance of our equation for the 1980s, there is a need to test for the structural stability of the equation. The structure of the equation should be stable if the wage slowdown in the 1980s is to be explained in a unified way and without recourse to ad hoc exogenous structural shifts. Then the structural

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5) The usual treatments with low Durbin-Watson statistics in wage change equations are not to correct for autocorrelation but to interpret its magnitude as indicating degree of misspecification.

6) The Nixon price-control dummy variable takes values of 0.2 in 1971, 0.4 in 1972 and 1973, −0.3 in 1974, and −0.7 in 1975, which correspond to the timing impacts, i. e., the control effects and the post-control rebound effects. This is a slight modification of R. Gordon's treatment.

relationships which accounted for the wage explosion experiences in the 1970s would also account for the wage slowdown experiences in the 1980s. The structural stability of the equation is particularly needed because it might be otherwise objected that the fallback position ratio variable, which was found to have quite significant effects on the wage change, in effect served as a dummy for the 1980s.

In order to test for the structural stability of our equation, we have made a separate estimation for 1955~1979. The estimates are shown in the column 1 of table 2. The coefficients on all independent variables retain the expected signs, and are highly significant. The coefficient on the fallback position ratio is very similar to that for the full sample period. This remarkable similarity lends strong support to our claim that the FBR variable serves differently from as a dummy for the structural shift in the 1980s.

The Chow predictive test is used since there are not enough degrees of freedom to allow a reliable independent estimation for 1980~1988. The F(9, 21) ratio for the test is a highly insignificant 0.30 (the critical value is 2.37 at 5 percent). This result strongly suggests that there was no shift in the structure of our equation in the 1980s. We also tested for a possible shift in either the coefficient on U or the constant term. The equation (2-3) displays an equation identical to our equation (reproduced as (2-2)), except that it adds two extra variables, U times a dummy and a constant dummy for 1980~1988. The effects of these shifts are found to be quite insignificant.

For the sake of comparison, we also tested for the structural stability of a simple traditional equation, shown in columns 4 and 5. The F(9, 22) ratio for the Chow predictive test is 1.85, not that far from 2. 34, the critical value at 5 percent (1.93 at 10 percent). Predictably, the constant term and the coefficient on U were very unstable in the traditional equation. These results might lend some support to the arguments of wage norm theorists that there was a structural shift in the wage determination process in the 1980s. However, the structural stability of our equation suggests that the apparent structural shift in the traditional equation is due to a serious misspecification of omission of the worker's fallback position.

Forecasting Performance

The estimates of our equation for the full sample period appear to track well the wage developments in the 1980s. The root mean square error for 1980~1988 is only 0.43 and the forecast errors for almost all years in the 1980s are well within the standard error of the equation. It seems remarkable that a very parsimonious econometric formulation of the model accounts rather well for the wage slowdown of the period.

Forecasting performance for in-sample periods does not tell much about true predictive capacity of the model, though. Therefore, we will subject the model to a more stringent test for its forecasting ability for outside-sample periods. If the model is correct, it should reasonably well track the post-sample period experiences as well as those for within-sample period.

The expost forecasts for 1980～1988 on the basis of our equation estimated for 1955-1979 are presented as (3-1) in table 3. Shown are the forecast errors for each year in the simulation period, and the mean absolute error and the root mean square error for the full simulation period. The predictive accuracy of the model is indeed remarkable. The mean absolute error is a small 0.39 and the root mean square error is 0.49. The forecast errors for each year are within the standard error of the equation with the exception of 1985, although the difference is small.

For comparison, we estimated two equations for 1955～1979: (3-2) is the simple traditional equation and the other is added by a dummy for 1970～1979, during which the wage norm shifted upward according to Perry and Mitchell. Both traditional equations fail to track the wage slowdown in the 1980s. The root mean square errors and the mean absolute errors are much higher than those in our equation, and the forecast errors from both equations fare no better and many of them are well beyond the standard errors of the equations.[7] For the traditional equations, the development in the 1980s indicates nothing other than a structural shift in the wage determination process, or a norm shift.

Exogenous Norm Shifts?

The next question to be addressed is whether there is evidence for a wage norm shift in the 1980s (and in the 1970s) that is still left unexplained by our equation. To test for this possibility, two dummy variables were added to the equation, one for 1970～1979, the other for 1982～1988. Both periods were argued to have experienced shifts in the wage norm (for choices of these periods, see Perry, 1983; Mitchell, 1985; Wachter and Carter, 1989).

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7) It should be noted that the poor predictive ability of traditional wage change equations is not an artifact. Gordon(1988) finds that his more complex equation still overpredicts the wage developments in the 1980s.

The estimates in table 4 provide mixed results. The two dummies, when added to the traditional equation in the same way as wage norm theorists would estimate their equations, were found to be significant and of the expected signs. When they are added to our equation, however, a dummy for 1982~1988 is highly insignificant, while a dummy for 1970~1979 is significant but of smaller magnitude in its value than that in (4-1). The coefficient on the fallback position ratio is smaller (from 7.39 to 4.0) but retains its significance at lower (10 percent) level. By usual standards our equation is indistinguishable from the equation augmented by the dummies and the two equations are also very similar in terms of the ability to explain the wage slowdown in the 1980s.

From these exercises, we can conclude that there is little evidence for an exogenous norm shift in the 1980s which should be invoked to add to our wage change equation. In our opinion, much of alleged wage norm shifts can be explained by a proper understanding of the wage determination process which should consider the role of the worker's fallback position.

IV. Conclusion

It can be concluded from the preceding results that the wage change equation, when supplemented by changes in the worker's fallback position, offers a superior empirical explanation for the wage slowdown in the 1980s. We have attempted to explain it successfully, we believe, without reference to an exogenous structural shift in the wage determination process in the 1980s.

It might be objected that neoclassical wage equations based on theories of job search (Minford, 1983 is a good example) would provide an observationally equivalent explanation. According to theories of job search, the decrease in unemployment insurance benefits will lead the unemployed to search more actively for jobs and, therefore, to restrain wage demands. They also predict that the decline in unemployment benefits would be accompanied by the shortening in the duration of unemployment, ceteris paribus. However, the neoclassical theories of job search are not easily reconcilable with the observations that the duration of unemployment in the 1980s is much longer than before (see Summers, 1986; Murphy and Topel, 1987).[8)]

The limitations with this study are obviously many. First of all, the use of annual data, although justified by the unavailability of data on the worker's fallback position, is not particularly convincing in the estimation of wage change equations. With shorter frequency data, we would be able to specify much richer econometric equation. The estimation of the worker's fallback position might not as rigorous as it can be. The use of relevant micro data, if avaiable, might be very useful.

〈Table 1〉 Rate of Wage Change Equations, 1955～1988

	(1-1)	(1-2)	(1-3)	(1-4)	(1-5)
Constant	−4.36	0.07	−2.68	−27.45	−3.32
	(−4.41)	(0.08)	(−3.34)	(−6.81)	(−3.76)
U(t-1)					
UNE	15.69	14.85			
	(5.76)	(3.91)			
PUN			5.78		
			(6.35)		
OUT				25.88	
				(6.68)	
HEL					2.92
					(5.88)
FBR(t-1)	7.39		6.68	7.88	8.12
	(5.52)		(5.26)	(6.36)	(6.07)
DP(t-1)	0.50	0.56	0.43	0.48	0.41
	(11.76)	(9.86)	(11.20)	(12.51)	(10.07)
Adjusted R^2	0.87	0.74	0.88	0.89	0.87
S.E.	0.73	1.01	0.69	0.67	0.72
D.W.	1.50	0.90	1.30	1.36	1.33

Notes: The numbers in parentheses are t-statistics.
Data Sources: Data used in the construction of the FBR are from Unemployment Insurance Financial Data, ET Handbook No. 394, 1983 and annual updates to the handbook. The OUT is from R. Gordon, Macroeconomics, 1990. The HEL is from Business Conditions Digest. The PUN is from Handbook of Labor Statistics, 1989. The rest are from Economic Report of the President.

8) Murphy and Topel(1987) argue that longer durations of unemployment are uniform across industries, while Summers(1986) argue that they are concentrated in manufacturing sectors.

〈Table 2〉 Test for Structural Stability

1955~79	1955~88		1955~79	1955~88	
	(2-1)	(2-2)	(2-3)	(2-4)	(2-5)
Constant	−3.66	−4.36	−3.30	1.77	0.07
	(−1.56)	(−4.41)	(−1.74)	(1.92)	(0.08)
Dummy, 1980~88			−1.16		
			(−0.65)		
U(t-1)	13.87	15.69	13.51	7.09	14.85
	(3.00)	(5.76)	(3.38)	(1.71)	(3.91)
U(t-1)*Dummy, 1980~88			5.75		
			(0.47)		
FBR(t-1)	6.94	7.39	6.35		
	(2.48)	(5.52)	(2.83)		
DP(t-1)	0.49	0.50	0.51	0.59	0.56
	(6.58)	(11.76)	(9.24)	(8.51)	(9.86)
Adjusted R^2	0.79	0.87	0.86	0.75	0.74
S.E.	0.82	0.73	0.74	0.91	1.01
D.W.	1.45	1.50	1.50	1.35	0.90

〈Table 3〉 Ex Post Simulations, 1980~1988

	(3-1)	(3-2)	(3-3)
Forecast Errors			
1980	0.41	−0.73	2.06
1981	−0.38	−1.52	1.88
1982	0.11	−1.81	0.84
1983	0.12	−1.49	0.21
1984	−0.57	−1.27	−0.34
1985	−0.93	−2.20	−1.07
1986	−0.81	−2.31	−1.39
1987	−0.05	−1.48	−1.02
1988	0.06	−1.85	−0.98
Mean Absolute Error	0.39	1.63	1.09
Root Mean Square Error	0.49	1.69	1.23

Notes: (3-1) is from the equation (1-1). (3-2) is from the equation (1-2), and (3-3) from the equation identical to (1-2), except that it adds a dummy for 1970~1979. The dummy was significant with the coefficient of 1. 91.

〈Table 4〉 Test for Norm Shifts

	(4-1)	(4-2)
Constant	1.48	−1.69
	(2.10)	(−0.93)
Dummy, 1970~1979	1.11	0.80
	(3.46)	(2.31)
Dummy, 1982~1988	−1.14	−0.48
	(−2.94)	(−0.94)
U(t-1)	8.52	12.34
	(2.68)	(3.36)
FBR(t-1)	4.00	(1.88)
DP(t-1)	0.48	0.47
	(10.83)	(11.12)
Adjusted R^2	0.87	0.88
S.E.	0.71	0.68
D.W.	1.57	1.67

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