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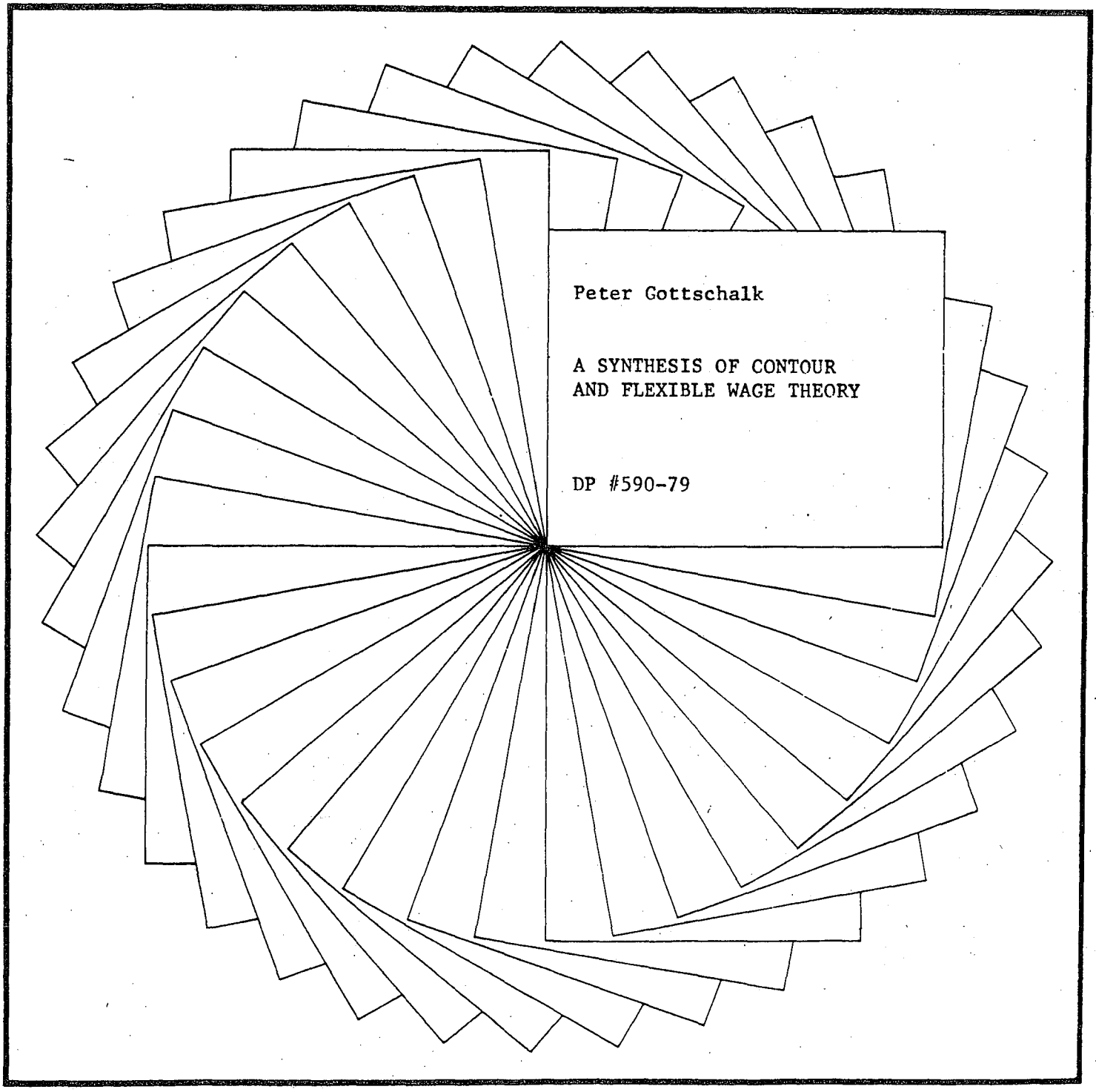

Peter Gottschalk

A SYNTHESIS OF CONTOUR AND FLEXIBLE WAGE THEORY

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# A Synthesis of Contour and Flexible Wage Theory

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## ABSTRACT

This review paper compares two competing theories of wage determination: contour and flexible wage theory. To facilitate comparisons, both are analyzed in terms of neoclassical concepts--utility maximization and cost minimization. I argue that since each is logically consistent with its own set of assumptions the choice between the theories remains an empirical question.

Several conceptual difficulties with verifying either theory are explored. I argue that contour theory is sufficiently broad to be consistent with almost any short run behavior in wages. Likewise, long run flexible wage theory is nearly irrefutable. The long run evidence is explored and shown to be consistent both with contour theory and with flexible wage theory under conditions of horizontal labor supply curves.

# A SYNTHESIS OF CONTOUR AND FLEXIBLE WAGE THEORY

This paper compares two competing theories of wage determination: contour and flexible wage theory. It is hoped that by recasting these well-developed theories in a common framework this paper will begin to bridge the gap between neoclassical flexible wage theorists and the institutional economists who focus on wage contours.[1]

Standard neoclassical flexible wage theory postulates that change in relative wages are explained primarily by changes in labor market tightness for different labor groups. In contrast, Dunlop's statement of contour theory, states "that wages and benefits are set by particular contours or sectors, and relative wage and benefit relationships are decisive to all compensation decisions. Factors such as living costs, profits, product prices productivity and occasionally unemployment or skill shortages may play a role in addition to the central matter of relativity"[2] (emphasis added). The essence of this alternative theory is that the wage structure is relatively rigid across a variety of dimensions, such as occupation, industry, region, and union/non-union sectors, so excess demand or supply for a particular labor subgroup may not affect relative wages. Past history determines wages in the short run, and market forces, if they have any impact, only affect relative wages in the long run.[3]

Contour theory has been a somewhat isolated offshoot of institutional labor economics, and, until recently, it has received little attention from orthodox theorists.[4] However, there seems to be a slow but perceptible increase in interest both from micro and macro theorists. Within micro

analysis, contour theory has found support from dual labor market economists such as Piore (1978) and other nontraditionalists such as Thurow (1975). Of equal importance is the recent interest expressed by traditional macro theorists, such as Hicks (1974) and Tobin (1972), who seek to explain why wages increase fairly uniformly in an economy composed of labor markets experiencing widely different degrees of market tightness.

This paper tries to bridge the gap between market and contour theories. Part 1 explores points of agreement and difference between the two theories. It asks whether the two theories are mutually exclusive. Some hypotheses are developed which are at least conceptually testable. Part 2 reviews the empirical evidence for each theory and discusses some inherent problems in testing either theory. Part 3 presents new evidence from a variety of data sources which shows that neither theory by itself can explain wage behavior.

## 1. ANALYTICAL DIFFERENCES BETWEEN CONTOUR AND FLEXIBLE WAGE THEORIES

In this section I analyze contour and flexible wage theory within a common framework.

### Utility Analysis

In order to provide a basis for comparison, I begin by reviewing the key assumptions of standard occupational choice analysis. I then develop the utility analysis which implicity lies behind contour theory.

The standard market paradigm roots occupational choice in utility analysis by assuming that persons have likes and dislikes about different jobs. These are reflected in individual utility functions:

$$U\ (A,\ Y,\ X) \tag{1}$$

where A is a vector of job attributes and Y is the corresponding vector of incomes, net of investment costs, associated with each occupation.[5] X is a vector of all other variables entering the utility function.[6] By comparing attributes and incomes of various occupations for which he or she is eligible, a person picks the occupation which yields the highest level of utility.

It is important to note that it is only the disagreeableness and the income for each job <u>open to the person</u> which determines the choice. For example, suppose a person who has been practicing law is trying to decide whether to take a job as a political advisor. Should lawyers' salaries drop sufficiently, relative to political advisors' salaries, the balance may be tipped and the lawyer will change occupations. However, increases in the salaries received by law clerks in the firm will have no effect on the lawyer's job choice.[7] Changes in the relative salaries for such noncompeting jobs[8] are irrelevant to the choice of occupation for the individual.

Contour theory introduces two new elements into utility maximization analysis. First, relative wages between jobs open to the person and jobs not open to the person may enter the utility function.

$$U\ (A,\ Y,\ S,\ X) \tag{2}$$

where S is a vector reflecting the structure of wages of all occupations in the worker's frame of reference, e.g. for lawyers this might include the salaries of law clerks and engineers working for the same company or lawyers in other firms. The worker gains utility if he or she feels the wage structure is equitable. The argument S, which depends on relative wages of jobs in the frame of reference, introduces this desire for equity.

This modification, which is unconventional but does not violate any principles of utility analysis, allows a change in the wage in a non-competing job to influence job preferences, e.g. if the wages of law clerks go up much faster than lawyers wages, the lawyer may experience a drop in utility even though he or she continues to reap the same relative monetary benefits and satisfaction from practicing law or being a political advisor. This may lead the lawyer to switch jobs and become a political advisor, where the frame of reference does not include the wages received by law clerks in the old law firm.

To add realism, it is usually assumed that people react asymmetrically when their wages move above and when they fall below their historical place in the wage structure. People focus only on those occupations in the reference group which receive wage increases larger than one's own.[9] The exact form in which S affects U is, however, less important than the assumption that it enters the utility function.

By itself, the introduction of S in the utility function adds realism without seriously affecting the predictions of neoclassical theory. The only change is that one may now observe non-zero cross elasticities of supply between competing and noncompeting occupations. Changes in the wage

structure which are perceived as being inequitable may induce the marginal worker to switch jobs. In terms of our example, the supply of lawyers may shift when either the salary of political advisors or law clerks changes. Standard theory usually ignores the latter possibility.

Note that this modification to utility analysis introduces a new force tending to restore relative wages, even between segmented jobs such as law clerks and lawyers. In addition to the normal inflow of workers into the occupation with increased wages (law clerks), one now introduces the possibility of outflows from occupations which have experienced a decline in utility from the wage change (lawyers). Given enough time for people to change jobs, it is possible that the old wage structure will reappear. With sufficiently large cross elasticities it is possible to observe a fairly rigid wage structure in a market clearing system, e.g. lawyers would continue to exit until their wages rise as much as that of law clerks.

Labor Service Flow

The second and conceptually separate modification introduced by contour theory leads to the conclusion that wages will not clear markets. The crucial assumption is that workers will be able to influence the wage structure, in response to utility decreasing perceived inequities, without changing jobs. By imposing significant costs on the firm in response to their dissatisfaction with contemplated changes in the wage structure, they may effectively stop any move toward a market clearing wage.[10] The theory that the employer may find it cost effective not to change relative wages to attract the scarce labor group is not novel. It has been central in much of the labor relations literature.

The most obvious method of imposing costs is to undertake coordinated job actions. This is clearly of importance in unionized occupations where even standard theory recognizes that non-market conditions will affect wages. The contribution made by contour theory in this area is simply to add the postulate that unions act as if they had utility function (2) rather than (1).

More important is the hypothesis that unorganized labor groups may also be able to impose costs by altering the labor supply per employed worker in response to perceived inequities. The key to the analysis is the recognition that employment involves an exchange of hours of work for a wage. The labor service flow per hour can be altered by the employee and is only controllable within broad bounds by the employer.[11] Limitations on employer control will depend both on the cost of monitoring the worker's input or output and the cost of firing those who alter their labor service flow in response to perceived inequities. Firing costs, which include not only the usual termination costs but also the cost of less efficient on the job training (as dissatisfied workers are less cooperative in transmitting their specific knowledge to new workers) may be high.[12]

With the ability to impose costs, the inframarginal worker can affect the wage structure without quitting. Whether the result is a stable contour of wages depends on: 1) the amount of agreement among workers on what constitutes an equitable wage structure;[13] 2) how strongly workers feel about the inequity, which will influence the size of the costs imposed on the employer; and 3) the relative cost to the employer of not changing the

wage structure. The latter may involve paying some workers more than the market clearing wage or adjusting to a shortage of some occupations to avoid raising their wages off of the contour.

Piore (1978) and Hicks (1974) argue that employers recognize that granting a wage increase for the group in short supply would lead to a call for general wage increase as other groups tried to maintain their relative wages. Given sufficiently costly disruptions, the employer would find it more profitable to live with the bottleneck than to try to eliminate it through wage adjustments.[14] The result is a cost minimizing equilibrium at nonclearing wages.

Note that viewing wage adjustments in this cost benefit framework explains why wages in the reference occupations do not move together uniformly. Even if each occupation included all other occupations in its reference group, all wages would not be rigidly interlocked since some employers would find it advantageous to take account of the disutility of disturbing contours while others would not.

In summary, entering the structure of wages in the utility function is not sufficient to explain stable contours at non-market clearing wages. Employees must be able to translate their dissatisfaction into cost on the firm either directly by leaving the firm or indirectly by reducing worker service flow. Unless these costs are sufficiently large, employers will raise wages in relatively tight occupations and ignore the impact on other workers.

Finally, note that contour theory is a theory of supply, not demand. Whether demand for factors vary with the changes in wages is not specified

by contour theory. Because relative wages are assumed to change little, contour theorists tend to think in terms of changes in factor proportions being determined by changes in technologies. This is, however, not a necessary corollary. One could postulate that if relative wages changed, employers would adjust their demands.

Since contour and flexible wage theory can be derived from the same neoclassical base, it is not necessary to deny the applicability of one theory to accept the usefulness of the other. The two can coexist. The relative importance of each remains an empirical question.

## 2. PROBLEMS OF VERIFICATION

In this section I argue that there are inherent problems in distinguishing between contour and flexible wage theory in the short run. Long-run behavior of wages, while less powerful in discriminating between the theories, avoids some of the conceptual problems inherent in testing short-run predictions.

### Short-run Predictions

The standard method of sorting out the relative importance of the two theories is to regress the wage increase for occupation i, $\dot{w}_i$, against some measures of labor market tightness for that occupation, $T_i$, and a vector of wage increases received by other occupations $\dot{w}_j$.

$$\dot{w}_i = F(T_i, \dot{w}_j) \tag{3}$$

It is important to include both types of variables in the equation. If one theory is correct and the other is not, then the equation has superfluous variables, which does not introduce bias. If both theories have explanatory power, then the equation does not suffer from the omitted variables bias which could be introduced by estimating separate regressions to test each theory.

The problem with such an equation is that the choice of level of aggregation is very likely to prejudice the results. The higher the level of aggregation, the more likely it is that market theory will be verified and that contour theory will be rejected.

Short-run behavior consistent with a market wage theory is less likely to be supported by disaggregated data because of the conceptual and practical difficulties of measuring labor market tightness for very specific markets. If labor market pressure partially comes from the employed and unemployed in other occupations wishing to switch occupations, then a simple count of unemployed in one occupation will not capture market forces. It may, therefore, be necessary to use fairly wide labor groups to span these overlapping labor markets. However, this is at the cost of possibly missing contours at lower levels of aggregation.

There are also simple data problems which do not allow a test of flexible wage theory at a disaggregated level. Even unemployment by SMSA is available only for eight major occupations, and that data has only been published recently. Labor market tightness for very specific occupations is unavailable from published sources because of statistical unreliability and conceptual problems.

Flanagan's study (1976) of union/nonunion wage interdependence is a good example of a study which maintains a high level of aggregation in order to measure market forces but does not test for contours at a lower level of aggregation where supporters would claim contours exist, e.g. within the building trades in a specific city. The fact that Flanagan finds little interdependence between union and nonunion wages may be evidence that contours do not exist or that they do not exist at the aggregated level at which he tests.

Even if data were available the conceptual problems in verifying short-run predictions might still be insurmountable. The first complication lies in identifying the reference occupations.[15] The range of possibilities for linkages is sufficiently wide to preclude any simple across the board generalization. People may care about their wages relative to wages in the same job ladder (e.g., lawyers and legal aids), other occupations (e.g., lawyers and accountants), the same occupation in different industries or geographic areas,[16] across union/nonunion classifications, or any number of other dimensions.

To further complicate matters, the reference occupation may not be stable. As was explained in Part 1, if people value their position relative to a number of different occupations which do not have uniform wage increases, there may be considerable shifting of key occupations as people desire to do as well as the occupation currently receiving the largest increase.

Suppose that the key reference occupation could be isolated in each period. Further complications in verifying the short-run implications of

the theory would be introduced by implicit discontinuities in the adjustment process. Wages are not set at the same time for all occupations. No simple lag structure is likely to be widely applicable, and a single structure may not even be applicable to the same occupation over time. The lack of synchronization further complicates the process because it may be cost effective to acquiesce to a wage demand at some times but not others. For instance, if store clerks care about their wages relative to the wages of stenographers, then a large settlement for stenographers might trigger a similar increase for store clerks right before Christmas while it would have less impact in July.

One probably needs a rather elaborate, highly disaggregated cost benefit model to verify short-run contours. Given the ideosyncratic nature of such models, one runs the risk of being unable to refute the charge that the choice of reference occupations, employer reaction, and timing are heavily biased in favor of showing contours. Given the large number of possible reference wages, it is very likely that one can always find some subset of wages moving similarly to the wage one is trying to explain. Whether such evidence verifies short-run contours or exhibits the researcher's latitude in picking reference wages would be unclear.

Without good econometric evidence, people have shifted focus from the wage settlements themselves to the institutions which generate these wages. The most commonly cited short-run evidence in support of contour theory is the observation that labor negotiators find both parties in labor management disputes frequently making references to wages of similar

workers in other industries or relative wages of different workers in the same industry. By itself, this evidence, which is consistent with short-run predictions of contour theory, is, however, not inconsistent with flexible wage theory. If wages were determined solely by market factors, one might still find employers looking to other markets to estimate market clearing wages.[17] Furthermore, as we argued in Part 1, it takes more than concern for other wages to yield stable contours. The employees must have both the desire and the ability to impose sufficiently high costs on the employer to bring about the desired wage.

Long-run Predictions

Measurement problems are less intractable in testing long-run predictions. Supporters of contour theory need not worry about whether two wages are perfectly in-phase at the time of the test since the current deviations will be small compared to the long-run increase in both wages, e.g. if plumbers are looking to an extra 5% raise at their next bargaining round in order to catch up with the latest electricians' settlement, this will be of small consequence if we are comparing the total wage increase for the two groups over a 15-year period. Furthermore, it is less crucial to isolate specific reference occupations. If all occupations are loosely knit through a set of interlocking contours then, over the long run, one should observe any two occupations experiencing similar wage increases, even if they do not include each other in their reference groups.

For these reasons, one can test long-run predictions of contour theory with the fairly aggregated data necessary to test market wage theory. It

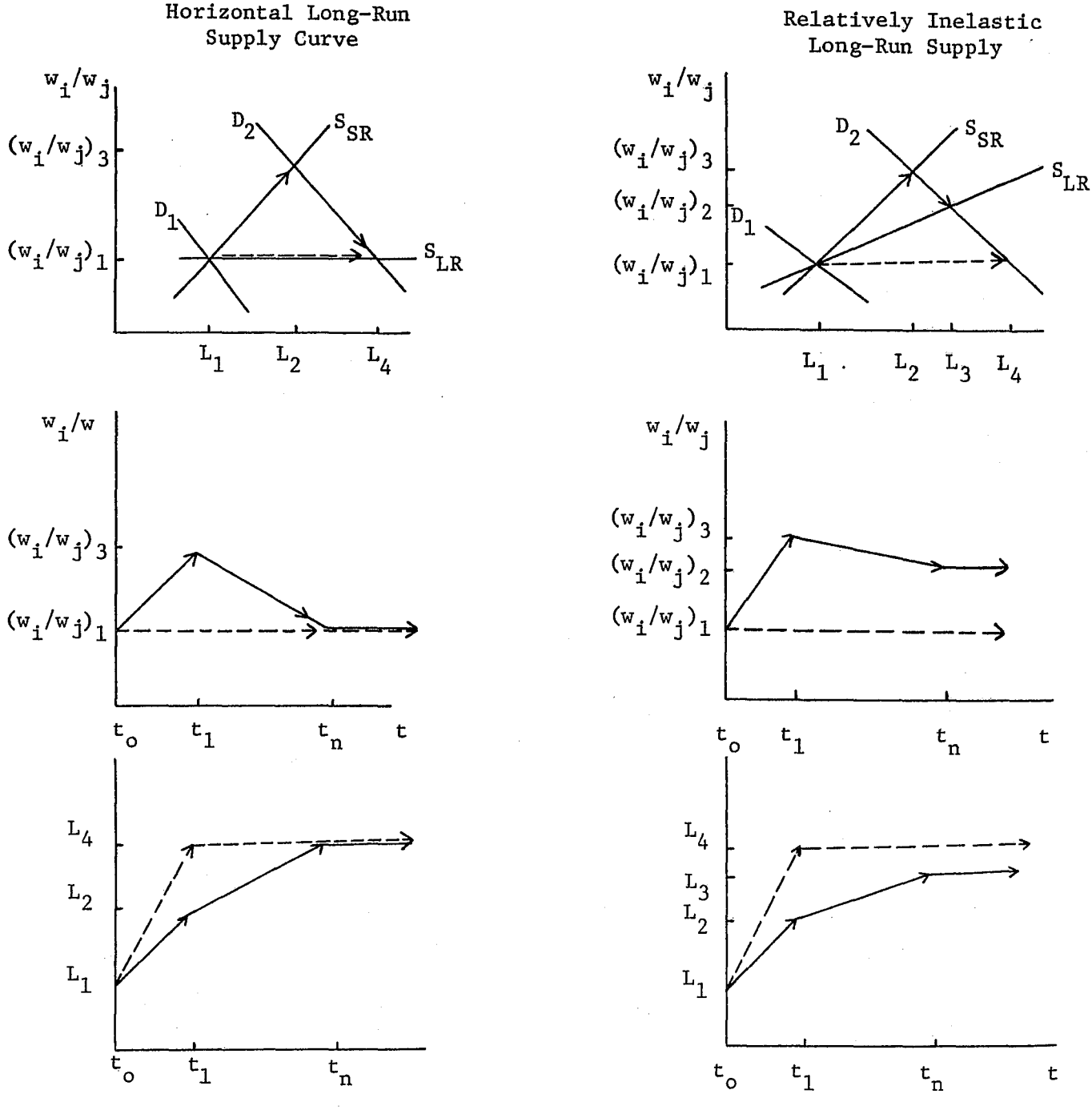
would therefore seem that verification of the two theories might be possible.

Unfortunately the two theories may yield similar long-run predictions, thus decreasing our ability to distinguish between the two. Specifically, while long-run stability of wage relatives is a necessary conclusion of contour theory, such stability is not necessarily a contradiction of market wage theory. The simple Marshallian adjustment mechanism coupled with a horizontal long-run supply curve for each occupation is sufficient to yield the same wage and employment pattern as that predicted by contour theory.[18]

This is shown in the left-hand column of Figure 1. The solid and broken arrows indicate the path predicted by flexible wage and contour theories respectively in response to a shift in demand for occupation i. The shift in demand occurs at $t_0$, by $t_1$ the short-run adjustment has been achieved, and by $t_n$ the long-run pattern has emerged. If the long-run supply curve is perfectly elastic, both contour and flexible wage theory predict that, in the long run, the relative wage will return to $(w_i/w_j)_1$, and employment will expand to $L_4$. The only difference is that flexible wage theory postulates that the increased supply will have been induced by a short-run rise in the relative wage of occupation i while contour theory postulates that the increased supply will have been induced by the increased employment opportunity in this occupation, which increases the expected wage. Stated in this form, short-run predictions differ, but as was argued in the previous section, they may not be testable. Long-run predictions may be testable, but they may be identical for the two theories.

Figure 1

Wage and Employment under Flexible and Contour Theories



Long-run evidence can only refute contour theory. Flexible wage theory is sufficiently broad in its long-run predictions that only the very inelastic supply curves in the right hand panels of Figure 1 would be contradicted by long-run wage rigidity. Evidence on the long-run flexibility of wages can therefore: 1) refute contour theory; or 2) verify either the existence of contours or the existence of flexible wages with elastic supply curves. In the following section I present evidence which supports the second possibility.

## 3. EMPIRICAL EVIDENCE

Tables 1, 2 and 3 show the growth rate in employment and wages for several occupations. These tables support the notion that employment varies considerably more than wages in the long run.

Table 1 compares growth rates of employment and wages for eight broad occupations over an 18-year period.[19] Casual inspection indicates that employment growth rates differed widely between occupations while wage increases were fairly uniform. As summary measures I will use the normalized variance of employment growth, $var^*_E$, and wage growth, $var^*_W$. These are simply the variances of each set of growth rates divided by their means. They are shown in the bottom row of Table 1. For women $var^*_E$ is .74 while $var^*_W$ is only .02. For men the figures are .53 and .004.[20] The similarity of wage increases for occupations with very different employment growth rates is striking. For instance, notice that the fastest growing occupation for which wage data is available, female professionals, and the slowest growing occupation, male operatives, both experienced similar wage increases 5.5 and 5.4% respectively.

The general pattern is verified in wage and employment growth for more narrowly defined occupations surveyed in the 1960 and 1970 Census of Population. Table 2 shows a $var^*_E$ for these occupations of 2.2 while their $var^*_W$ is only .06. Again notice that those occupations, like purchasing agents and buyers, experiencing large increases in employment received roughly the same wage increase as those occupations, like truck drivers, experiencing an absolute decline in employment.

Table 3 focuses on the construction trades. The standardized variances again show much larger variation in employment growth than wage growth in the construction trades. Those occupations experiencing relatively large employment increases, like cement finishers and glazers, received only slightly higher wage increases than those experiencing absolute declines in employment, such as machinists and plasterers. Clearly there were forces at work which kept the construction trades from lowering their relative wages.

The fact that occupations which experienced substantially different employment growth rates had very similar long-term growth rates in wages is clearly established. However, this evidence would support either contour theory or flexible wage theory with very elastic supply curves. As was explained in Part 2, in order to distinguish between contour theory and a qualified flexible wage theory, one needs to look at the adjustment process which brought about these fairly uniform long-term wage increases. An equation such as the following may capture the relative importance of short-run market and contour forces.

Table 1

Growth Rates of Employment and Wages/Salaries
by Major Occupation, 1958-1976

| Occupational Classification | Employment | | Wages and Salaries of Year-Round Full-Time Workers | |
|---|---|---|---|---|
| | Female | Male | Female | Male |
| Professional and technical | 4.40% | 3.10% | 5.46% | 5.31% |
| Managers | 3.50 | 1.38 | 5.31 | 5.29 |
| Sales | 2.24 | 1.47 | 5.49 | 5.59 |
| Clerical | 3.78 | .72 | 4.86 | 5.42 |
| Craftsmen | 4.89 | 1.47 | -- | 5.18 |
| Operatives | 1.48 | .63 | 4.91 | 5.35 |
| Service (except private household workers) | 4.39 | 3.00 | 5.25 | 5.25 |
| Labor (nonfarm) | 7.63 | .82 | -- | 5.62 |
| Mean | 4.04 | 1.57 | 5.30 | 5.38 |
| Variance | 3.00 | .83 | .10 | .02 |
| Variance/mean | .74 | .53 | .02 | .004 |

Source: Employment and Training Report of the President, 1978, Table A15; Current Population Reports, Series P-60 N. 69, and yearly updates.

Table 2

Growth Rate of Wages and Employment for Males in Selected Occupations

| Occupation | (1) Median Wage and Salary Income of Year-Round Workers 1959 | (2) Median Wage and Salary Income of Year-Round Workers 1969 | (3) Yearly % Change | (4) Employed Persons 1959 | (5) Employed Persons 1969 | (6) Yearly % Change |
|---|---|---|---|---|---|---|
| Civil Engineers | $7,803 | $13,084 | 5.16 | 156.4 | 173.7 | 1.05 |
| Pharmacists | 6,960 | 12,428 | 5.79 | 84.8 | 97.1 | 1.35 |
| Purchasing Agents/Buyers | 6,941 | 11,599 | 5.13 | 93.4 | 140.1 | 4.05 |
| Photographers | 5,917 | 9,181 | 4.39 | 44.9 | 55.1 | 2.04 |
| Sales Representatives (Mfg.) | 6,962 | 11,460 | 4.98 | 415.8 | 378.7 | - .93 |
| Salesmen and Sales Clerks (Retail) | 4,549 | 7,507 | 5.01 | 1,208.4 | 1,194.7 | - .11 |
| Bill Collectors | 4,693 | 7,153 | 4.21 | 25.7 | 32.7 | 2.41 |
| Insurance Adjusters | 5,781 | 9,359 | 4.81 | 48.6 | 71.6 | 3.87 |
| Bakers | 4,824 | 7,243 | 4.06 | 89.8 | 77.0 | -1.54 |
| Carpenters | 5,199 | 7,857 | 4.12 | 820.1 | 841.0 | 2.52 |
| Electricians | 6,284 | 9,615 | 4.25 | 336.7 | 492.3 | 3.38 |
| Plumbers/Pipefitters | 6,093 | 9,368 | 4.30 | 305.6 | 380.3 | 2.19 |
| Printing Craftsmen | 6,193 | 8,971 | 3.71 | 283.4 | 333.1 | 1.62 |
| Meat Cutters | 4,986 | 7,959 | 4.68 | 175.0 | 241.6 | 3.22 |
| Truck Drivers | 4,752 | 7,690 | 4.81 | 1,548.2 | 1,369.7 | -1.23 |
| Bartenders | 3,968 | 6,112 | 4.32 | 153.0 | 148.3 | - .31 |
| Barbers | 3,903 | 5,721 | 3.82 | 174.5 | 161.7 | - .76 |
| Mean | | | 4.56 | | | 1.34 |
| Variance | | | .28 | | | 2.95 |
| Variance/mean | | | .06 | | | 2.2 |

Sources: 1960 and 1970 Census of Population, Subject Reports PC(2)-7A. Cols. 1-2: Table 25 (1970) and Table 28 (1960). Cols. 4-5, 7-8: Table 38 (1970) and Table 13 (1960).

$$(\dot{\omega}_i - \bar{\dot{\omega}})_t = \alpha_0 + \alpha_1 \frac{1}{(U_i - \bar{U})_t} + \alpha_2(\dot{\omega}_i - \bar{\dot{\omega}})_{t-1} + \alpha_3(\dot{\omega}_i - \bar{\dot{\omega}})_{t-2} + \varepsilon \quad (4)$$

where $\dot{\omega}_i$ and $\bar{\dot{\omega}}$ are the wage increase for occupation i and the average increase for all occupations. $U_i$ and $\bar{U}$ are occupation specific and overall unemployment rates. Flexible wage theory implies that, in the short run, wages in occupation i rise faster than average when the difference between its unemployment rate and the overall rate declines.[21] This implies $\alpha_1$ is negative. It also implies that if average wage increases in past years reflect market clearing wage changes in those years, then they do not affect this year's relative wage increases. Hence, $\alpha_2$ and $\alpha_3$ are zero. On the other hand if there is only partial adjustment to labor market tightness in any year, then $\alpha_2$ and $\alpha_3$ will be positive--if labor market tightness warranted a wage increase last year, then, holding unemployment constant, wages would increase in both years due to the delayed adjustment.

Contour theory postulates that relative labor market tightness is not a determinant, that $\alpha_1$ is zero, and that current relative wage increases can best be explained by past wage experiences. Hence $\alpha_2$ and $\alpha_3$ are negative--occupations which experienced lower than average wage increases demand and get larger than average increases as they attempt to catch up.

As was argued in Part 2, the level of aggregation chosen to estimate this equation will influence the results--flexible wage theory will be more easily verified by aggregate data while the predictions of contour theory will most likely show up in disaggregated data. Because of the lack of good disaggregated measures of wage and unemployment, equation (4) is estimated only for the eight broad occupational groups discussed earlier. It should,

Table 3

Yearly Growth Rate of Employment and Wage Rates for Selected Construction Trades, 1959 to 1969

| Trade | Employment | Union Hourly Wage Rate |
|---|---|---|
| Asbestos Worker | 3.0% | 4.8% |
| Boiler Maker | 2.6 | 4.4 |
| Carpenter | 0.5 | 4.7 |
| Cement Finisher | 5.0 | 4.6 |
| Electricians | 4.0 | 4.8 |
| Glaziers | 5.4 | 4.8 |
| Machinists | -2.4 | 4.5 |
| Painters | -1.0 | 4.7 |
| Paperhangers | 1.8 | 4.8 |
| Plasterers | -4.1 | 3.9 |
| Roofers | 1.9 | 4.4 |
| Sheetmetal | 1.9 | 4.8 |
| Stonemasons | .0 | 4.2 |
| Structural Iron | 2.4 | 4.7 |
| Mean | 1.5 | 4.6 |
| Variance | 6.59 | .07 |
| Variance/mean | 4.39 | .02 |

Source: Census of Population, Subject Reports PC(2) 7A. 1960 (Table 13) and 1970 (Table 38). Column 2: Bureau of Labor Statistics, Union Wages and Hours: Building Trades, July 1, 1975, Table 2.

therefore, be remembered that contours which exist among occupations within a broad labor group will not be picked up in these data.

Because of the data limitations and methodological problems discussed earlier, it is important to interpret the results shown in Table 4 with caution. While tentative, the results are instructive since they suggest that both theories may have validity.

The impact of relative labor market tightness shows up for white-collar occupations. Of the 14 equations estimated, seven have positive coefficients on the unemployment variable which are significant at the .1 level. Labor market tightness at least affects some occupations. Interestingly these are primarily white-collar occupations. Differences in unemployment rates, however, are not the only factor explaining differences in wage increases. Almost all lagged wage terms have negative coefficients, as predicted by contour theory. These coefficients are highly significant for professionals, managers, service occupations and weakly significant for sales occupations. This indicates that for white-collar occupations contours, as well as labor market conditions, may explain short-run wage behavior.

Interestingly, none of the variables worked very well in explaining wage increases for craftsmen and operatives which include the standard unionized occupations. Labor market tightness in very specific markets may affect wages. Contours may exist at lower levels of aggregation. However, without good measures of labor market tightness for these detailed craft occupations, it is hard to visualize the test which will discriminate between the theories.

Table 4

Wage Adjustment Equation (1961-1976)

$$(w_i-\bar{w})_t = \alpha_0 + \alpha_1 {}^{1}/(u_i-\bar{u}) + \alpha_2(w_i-\bar{w})_{-1} + \alpha_3(w_i-\bar{w})_{-2}$$

| | $\alpha_0$ | $\alpha_1$ | $\alpha_2$ | $\alpha_3$ | $R^2$ | Adj $R^2$ |
|---|---|---|---|---|---|---|
| Professional and Kindred | | | | | | |
| Female | -9.8 | 4.08*** | -.81*** | -.31 | | |
| | | (2.14) | (.24) | (.25) | .54 | .43 |
| Male | -4.3 | 1.69* | -.47* | .01 | | |
| | | (1.11) | (.28) | (.27) | .29 | .11 |
| Manager | | | | | | |
| Female | .5 | -.05 | -.68*** | -.58** | | |
| | | (2.43) | (.28) | (.33) | .36 | .21 |
| Male | -14.2 | 4.21*** | -.39* | -.08 | | |
| | | (.60) | (.26) | (.27) | .46 | .32 |
| Clerical | | | | | | |
| Female | -10.3 | 7.89* | -.37 | -.46* | | |
| | | (5.83) | (.28) | (.32) | .21 | .01 |
| Male | 3.3 | -2.72 | -.17 | -.46* | | |
| | | (4.89) | (.26) | (.27) | .22 | .03 |
| Sales | | | | | | |
| Female | -20.8 | 17.37* | -.37* | -.21 | | |
| | | (11.41) | (.27) | (.26) | .28 | .09 |
| Male | -13.4 | 11.20* | -.43* | -.08 | | |
| | | (6.51) | (.25) | *.30) | .41 | .26 |
| Craftmen | | | | | | |
| Male | -1.0 | .56 | -.22 | -.11 | | |
| | | (2.36) | (.29) | (.32) | .07 | -.15 |
| Operatives | | | | | | |
| Female | 10.4 | 13.76 | -.19 | .23 | | |
| | | (14.25) | (.19) | (.28) | .21 | .02 |
| Male | | 9.78 | .03 | .26 | | |
| | | (9.89) | (.21) | (.21) | .15 | -.05 |
| Service | | | | | | |
| Female | 18.7 | 22.74* | -.61*** | -.53*** | | |
| | | (15.56) | (.22) | (.22) | .48 | .35 |
| Male | 5.3 | -6.62 | -.78 | -.40* | | |
| | | (11.44) | (.27) | (.28) | .40 | .26 |
| Laborers | | | | | | |
| Male | -3.7 | 8.81 | -.37 | -.22 | | |
| | | (25.66) | (.29) | (.28) | .13 | -.07 |

***Significant at .01 level
**Significant at .05 level
*Significant at .10 level

## 4. CONCLUSIONS

The preceding analysis indicates that contour and flexible wage theories are neither conceptually nor empirically mutually exclusive. Each theory is a special case of the more general theory of utility maximizing job choice. What remains is to identify the relative importance of each theory for specific labor markets. A small step was taken in this direction in this paper by looking at the long-run behavior of wages. The challenge is to develop the kind of data which will allow the identification of short-run processes which lead to long-run stability of relative wages.

Carefully identifying the relative importance of each theory for specific labor markets is important in setting policy as well as in putting in order our own thinking. The penchant of economists to assume that there is a relationship between relative labor supplies and relative wages clearly narrows our vision of feasible policies.

This is all too clear in macro policy where it is generally assumed that wage controls would freeze the current occupational mix. The implication is that shortages would develop as demand changed the desired mix of occupation. What this paper suggests is that, in the long run, many different occupational configurations may be possible with a given wage structure. The key question is how the transition is made from one long-run configuration to another. Occupations with strong feelings about the justice of the current wage structure and the ability to translate those feelings into costs on the firm may not allow short-run changes in factor

price. Adjustment in factor supplies would not be affected by price wage controls. For other occupational groups, wage price controls could inhibit the short-run wage induced change in supplies which restore the old contours.

Our vision of what is possible in changing employment conditions in specific markets is also limited by our adherence to a flexible wage theory. A current example is the debate over public employment of teenagers. To the strict flexible wage theorist there will a one-for-one decrease in the number of teenagers employed in the private sector for each teenager hired in the public sector.[22] Hence, there will be no effect on their unemployment. The argument goes as follows. Reducing unemployment will increase labor market pressures, and hence wages for teenagers will rise. Private employers will respond to these wage increases by decreasing their demand for teenagers. This will continue until there is a total offset. Contour theory suggests that if teenagers' wages are fixed in relationship to wages of other groups then the increased employment will not raise their wages, and hence there will not be any displacement. If wages should rise and teenagers' wages form part of other occupations' contours, then an increase in the wage of teenagers will induce a rise in some other wages. The result may be wage inflation but not necessarily displacement. Public service employment has drawbacks but they may not be those suggested by a flexible wage model.

Both theories are logically tight. I see no reason for accepting one and rejecting the other without further empirical work. My guess is that when this work is done, we will not find a clear winner. Rather labor economics will have been enriched by an understanding of the circumstances where each theory is applicable.

## NOTES

[1]The correspondence between institutional economists and contour theory holds in general, but not always. For instance, John Hicks has embraced this institutionalist concept (1974).

[2]Dunlop (1977), p. 227.

[3]Note that contour theory is different from, though complementary to, contract theory which claims that wage rates of any group tend to be fixed for a set period of time while employment is not guaranteed. Contract theory per se does not deny that the wage rate for any group will be bid up in the face of excess demand for that group once the contract is renegotiated. For a discussion of contract theory see Baily (1978).

[4]See Santemero (1978) for a recent dismissal of contour theory.

[5]The utility function, which describes the subjective evaluation of job attributes and incomes, is maximized subject to a constraint reflecting the feasible set of tradeoffs between attributes and net incomes.

[6]To avoid extraneous issues of work/leisure choice, assume that the number of hours for each job is fixed. Reliance on income support may be incorporated into the analysis by letting some "job" be an income support program.

[7]It is assumed that lawyers could not become law clerks in the same firm. In practice, this is a valid assumption.

[8]Throughout this paper the term noncompeting occupations is used to signify jobs which are not open to the worker because of skill limitations or social conventions; e.g., five-footers cannot become professional basketball players, and law partners are not free to apply for positions as law clerks. The analysis could also be applied to jobs which are not strictly closed to the employee but which are dominated by jobs whose attributes and incomes offer greater utility at all relevant wage rates. For example, a lawyer could become a garbage collector, but, under standard analysis, as long as the wages of garbage collectors do not rise enough to cause a job switch, there is no change in the lawyer's utility as garbagemen's wages rise.

[9]Note that even under a strict interpretation of contour theory all occupations in the reference group will not necessarily receive the same wage increase since they need not be in each other's frame of reference (e.g. law clerks and political advisors). If this is the case then some mechanism must exist for determining with which wage rate one tries to align oneself. One possibility is that one focuses on the occupation with the largest wage increase.

[10]The implicit assumption is made that this unexploited bargaining power has costs to the employee--it is disagreeable to fight with the supervisor or punitive measures may be taken by management. The job action is undertaken only when the dissatisfaction with the change in the wage structure outweighs the costs of retaliation.

[11]The point that employees pay a fixed wage for a variable labor service flow is not new. It is found in modern labor relations literature and the works of classical economists. For instance, Marx used the same point to come to some very different conclusions.

[12]See Thurow (1975) and Doeringer and Piore (1971).

[13]If each wage structure is considered onerous by a sufficiently large number of workers, then employers may not be influenced by employee pressure. Any attempt would lead to the disaffection of some groups.

[14]The response to an increase in demand for one of the labor subgroups depends on several factors. Suppose there is an increase in demand for labor group $L_i$ and that the labor service flow from $L_j$ depends on not disturbing the existing $W_i/W_j$ ratio. If $\partial S_i/\partial W_i$ is small and $\partial S_j/\partial W_i$ is either large or $S_j$ is a relatively large part of the wage bill, then it may be cost effective not to raise wages for $L_i$ or to raise them for both $L_i$ and $L_j$.

[15]See Shulenburger (1978) for attempts to deal with this and the timing problem discussed later.

[16]The 1978 strike of grocery clerks was partially over differences in wages between northern and southern California.

[17]Insistence on cost of living adjustments and other forms of across the board wage increases which maintain constant relative wages is another bit of institutional evidence in support of contour theory.

If this was the only source of wage increase, this would be strong evidence counter to market wage theory. Such increases would be predicted only under special circumstances such as equal increases in demand for each occupation (possibly as the result of fixed factor proportions) and similar supply elasticities. However, across the board wage increases may simply form the basic increase with supply and demand explaining the crucial differences in wage increases.

[18]Inasmuch as people differ in job preferences, job related natural skills or ability to borrow to acquire skills, the slope of the long-run supply curve would not be horizontal according to neoclassical theory.

[19]For earlier evidence on the rigidity of the wage structure see Maher (1961), Eckstein (1962), and work cited in their papers.

[20]The male/female breakdown is shown to take account of the fact that, due to job segregation, these broad categories may reflect very different jobs for men and women. An analysis of growth rates for combined male and female groups gives similar results.

[21]Unemployment rates are proxies for labor market tightness. As explained earlier, there are serious conceptual and measurement problems with any measure of relative tightness. However, if the theory is to be testable, some admittedly imperfect measure must be used.

[22]For a discussion of this view see Bailey and Tobin (19 ). Through an ingenious argument, they see less than a one-for-one exchange. Their model is, however, a flexible wage model.

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