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THE IMPACT OF RELATIVE WAGES ON VOLUNTARY LABOR TURNOVER IN THE TEXTILE INDUSTRY

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Introduction

Labor turnover can be costly to a firm. Costs borne by the employer include search costs to replace a lost employee and then the expense of training the new worker. These costs may be reduced if there is an excess supply of labor and a queue of qualified workers waiting to work or if the cost of training can be shifted to the new worker through reduced wages. However, these conditions vary with the labor market situation and the kind of training given to the worker.

The turnover problem is particularly acute in the textile industry where a relatively high rate of turnover has persisted for years. As measured by the U.S. Department of Labor's quit rate, the industry's labor turnover has exceeded that of the manufacturing sector since 1954. The various numerical values are shown in Table I. While the quit rate for manufacturing exceeded that of the textile industry in 1952, the textile quit rate was nearly twice that of the manufacturing sector in 1971.

Given these relative differences in quit rates, the purpose of this paper is to establish the relationship between relative wages (textile vs. manufacturing) and the voluntary labor turnover rate of textiles relative to manufacturing . The discussion which follows is divided into (a) a brief comment about the literature, (b) a model specification section with an explanation of all the variables, (c) data collection and statistical analysis, and (d) a summary and conclusions.

Literature Considerations

Our principal concern in this paper is the relationship between textile turnover and wages. However, in order to get a true representation of the relation, it is necessary to specify a full model which includes the other explanatory variables typically used to account for turnover. In studying the literature, several other variables were judged to be important by other researchers.

One of these is age. Younger employees tend to have higher rates of turnover than older employees. Roux Van der Merwe and Sylvia Miller [13] found a negative relationship between age and turnover in a study of workers in a South African shoe factory. Their finishings indicated that older leavers remained with their jobs longer than younger leavers at all lengths of service categories.

Table I

Comparison of Average Monthy Quit Rates

Year	Textile Quit Rate	Manufacturing Quit Rate	Ratio
1952	2.05	2.30	0.891
1953	2.12	2.35	0.902
1954	1.28	1.12	1.143
1955	1.72	1.55	1.110
1956	1.85	1.60	1.156
1957	1.58	1.35	1.170
1958	1.28	0.90	1.422
1959	1.72	1.25	1.376
1960	1.65	1.10	1.500
1961	1.48	1.15	1.287
1962	1.95	1.40	1.393
1963	1.92	1.40	1.371
1964	2.05	1.50	1.367
1965	2.55	1.88	1.356
1966	3.48	2.55	1.365
1967	3.35	2.32	1.444
1968	3.62	2.50	1.448
1969	3.92	2.70	1.452
1970	3.45	2.12	1.627
1971	3.38	1.78	1.899
1972	4.25	2.22	1.914
1973	5.02	2.72	1.846
1974	4.02	2.32	1.733
1975	2.30	1.35	1.704

This data collected from the *Monthly Labor Review*.

A second important variable found in the literature is the unemployment rate: periods with high levels of unemployment usually have lower rates of turnover than do periods with low levels of unemployment. The unemployment rate seems to be a reliable predictor of turnover because it indicates the availability of opportunities in the job market. A high unemployment rate usually means that alternative jobs are scarce and vice versa. The strength of this relationship was confirmed by James March and Herbert Simon (8), who found the state of the economy to be the one most accurate predictor of turnover.

Another variable used in some studies is the sex of the worker. One finding is that female employees have higher rates of turnover than male workers.[1] One explanation is that women seem to attach more loyalty to their families than to their jobs. As a result, their entry into the labor force is of a more temporary nature since work is interrupted to have children or to specialize in home duties. Many women end up in jobs filled by members of the secondary labor force, and these jobs are often low paying and/or offer very little upward advancement. So the cost of a quit to a female worker is lower in this case than for the male worker who is in the primary labor force.

In their study, Paul Armknecht and John Early (1) found a positive then negative relationship between quit rates and the proportion of female workers in firms. In the years 1960 through 1962, a significant positive relationship existed, but the variable became insignificant in 1963 and 1964. Then the relation became significantly negative during the period from 1965 through 1971. As indicated by this study, the impact of increased labor force participation by women on quit rates seems to be inconclusive and it will be interesting to see what role this variable plays in determining textile quit rates.

Age levels, the unemployment rate and the proportion of women in the labor force are the variables most commonly found in the literature. In the section which follows, a turnover model will be specified using these variables plus others which are expected to be important in explaining textile quits.

Model Specifications and Explanation

The model of labor turnover specified is:

$$QTM_t = f(W_t, AR_t, P_t, HWA_t, LFP_t, U_t, A_t, S_t)$$

where

QTM_t = labor turnover in the textile industry relative to manufacturing,

W_t = wages in the textile industry relative to those in manufacturing,

AR_t = accession rate in manufacturing,

HWA_t = help-wanted advertising,

LFP_t = labor force participation rate in manufacturing,

U_t = unemployment rate

A_t = young workers,
S_t = female workers,
t = 1952 - 1975.

Since the principal purpose of this paper is to determine the significance of relative wages in explaining relative labor turnover, primary emphasis will be placed on the relationship between QTM_t and W_t. A significant, negative coefficient is expected since higher alternative wage rates are hypothesized to increase the textile quit rate and vice versa. As mentioned above, the other variables are necessary to insure that the model is not underspecified. Relative to the wage variable, we are not as interested in the signs and coefficients on the other determinants, but we have still tabled all of the variables and given each an expected sign (Table II). We shall now take a closer look at the dependent and independent variables in the model.

The dependent variable used as a measure of labor turnover is the textile industry (SIC 22) quit rate relative to the manufacturing quit rate. The quit rate is the most frequently used measure of labor turnover in the literature. [2] Several advantages recommend use of the quit rate, and a few limitations reduce the effectiveness of the measure.

One advantage is that voluntary labor turnover is measured directly. Some of the other measures merely indicate turnover rather than provide a direct measure. An example of an indirect measure is the average length of service. This measure, defined as the mean length of employment of all those presently working at a firm, is often used to measure turnover. A high average length of service suggests that turnover is low. When a firm is experiencing high turnover, the firm tends to have more workers with short tenure. This reduces the average length of service of a firm. However, a low average length of service does not necessarily mean that turnover is not occurring. In a large firm, high turnover may not be discovered in a small department. Long tenures in the rest of the firm can disguise the low lengths of service in that department.[3]

Simplicity is another advantage of the quit rate: the percentage of the working employees within a firm or industry who quit during a given time period. In addition, data on the quit rate are easily obtained. Some of the other measures do not have that advantage. For example, length of service requires detailed information from each firm. In contrast, the quit rate has already been computed by the Bureau of Labor Statistics.

The major disadvantage associated with using the quit rate as a proxy for turnover is that the measure does not identify the composition of turnover. For example, a turnover rate of 100% could indicate that all of the personnel quit once during the period or that half of the workers quit twice. However, the present study is mainly concerned with the variables which explain the changes over time rather than the composition of the quit rate. In particular, the pur-

Table II

Variables Used in the Regression Analysis

Variable	Symbol	Sign
Relative quit rate rate in textiles	Q	
Textile earnings ratio	W	Negative
Manufacturing accession rate	AR	Positive
Inflation rate	P	Positive
Index of help-wanted advertising	HW	Positive
Labor force participation rate	LFP	Negative
Unemployment rate	U	Negative
Young workers	A	Positive
Female workers	S	Positive

pose here is to determine the impact of relative wages on the relative quit rate in textiles. In conclusion then, the benefits associated with the use of the measure seem to outweigh the shortcomings.

The measure of the relative textile quit rate used here was the quit rate in textiles over the quit rate in manufacturing.[4] The purpose of this study was the main reason for selecting this particular specification. We are attempting to ascertain the explanatory power of the textile wage rate relative to that of the manufacturing sector indetermining the quit rate. In addition, the model specified can be used to determine if the relative wage rate is important in explaining why the quit rate in textiles has remained above that in the manufacturing sector. To do this, a measure of turnover which compares textile quits against manufacturing quits has been selected.

Of the eight independent variables, the wage rate is mentioned most often in the literature.[5] In the model, the average hourly earnings of the textile worker over the average hourly earnings of the manufacturing worker are used. Table III illustrates the relation. Textile wages have eroded steadily in comparison to the wages of the manufacturing sector.

The relative wage variable is a proxy not only for the wages of the textile worker but also for his wages relative to that of those people doing similar work in other manufacturing industries. The expectation here is that as the ratio of textile wages over manufacturing wages falls, the quit rate in textiles will increase. At the same time, the manufacturing quit rate should decline. As the textile wage rises relative to the manufacturing wage, the textile quit rate should fall, and the manufacturing quit rate will rise as workers leave other forms of manufacturing employment and enter the textile industry. When the earnings ratio declines the textile wage has fallen relative to the manufacturing wage, and so the expected loss to the worker from quitting a textile job relative to the gain from finding a manufacturing job becomes more attractive. A substantial increase in wages may be achieved by changing jobs. The opposite argument would explain worker behavior when the ratio increases.

A second variable is the accession rate in manufacturing. The accession rate is defined as the number of employees hired divided by the average number of employees working during the period. as the accession rate in manufacturing rises, all employees will be inclined to evaluate their current position relative to the expected gains associated with changing jobs. However, it is contended here that this increase in labor demand as measured by the accession rate will impact more on textile workers than on manufacturing in general. Given that the textile wage rate is near the bottom of the wage ladder, as job opportunities increase, the textile worker has a greater potential gain associated with quitting than the average manufacturing worker. For this reason, QTM is expected to rise as the accession rate for manufacturing increases.

Table III

Comparison of Average Monthly Earnings Ratios

Year	AHE - Textiles	AHE - Manufacturing	Ratio
1952	1.36	1.65	0.824
1953	1.37	1.74	0.787
1954	1.36	1.78	0.764
1955	1.39	1.86	0.747
1956	1.45	1.95	0.744
1957	1.50	2.05	0.732
1958	1.51	2.11	0.716
1959	1.57	2.19	0.717
1960	1.61	2.26	0.712
1961	1.63	2.32	0.703
1962	1.68	2.39	0.703
1963	1.71	2.49	0.687
1964	1.79	2.53	0.708
1965	1.87	2.61	0.716
1966	1.96	2.72	0.720
1967	2.06	2.83	0.728
1968	2.21	3.01	0.734
1969	2.34	3.19	0.734
1970	2.45	3.36	0.729
1971	2.57	3.57	0.720
1972	2.74	3.81	0.719
1973	2.95	4.07	0.725
1974	3.19	4.41	0.723
1975	3.40	4.81	0.707

This data collected from *Employment and Earnings*.

The third explanatory variable is the rate of inflation. The specific measure of inflation chosen here is the rate of change in the consumer price index over the time period 1952 - 1975.

An inflation differential measure is used because of the expected impact of price changes on real wages. With price inflation, an increase in nominal wages can be expected in both the textile and manufacturing sectors. However, the percentage change in textile money wages has been less than the percentage change in manufacturing money wages. Textile wages increased only 150% from 1952 to 1975 while wages in manufacturing rose 192% over the same period. Therefore, the real wage and real income of textile workers has declined relative to that of manufacturing workers.[6] Thus with faster rates of price change, it is expected that the textile employee will be more likely to quit than the manufacturing worker in general. So a positive relationship is hypothesized.

A fourth independent variable is the help-wanted advertising index. Computed by the Conference Board, this variable is used here as a proxy for the demand for skilled labor. The relation expected to be found is that as this index rises, the relative qut rate will also increase. Jobs requiring a skill are the ones advertised most often in daily newspapers. So a high value for the index is an indication of a large number of job vacancies, thus enhancing the worker's probability of obtaining a skilled job elsewhere. Since pay at textile plants is relatively low, these firms generally attract workers with few skills and provide limited training. During the course of training, these employees learn skills that are applicable in many other types of manufacturing operations.[7] So when firms in other manufacturing industries need skilled workers, their help-wanted ads attract a disproportionately high number of textile workers seeking higher paying jobs.

Another labor market indicator expected to affect relative quit rates is the supply of labor. In the model, the labor force participation rate is used as a measure of supply changes. A rising rate indicates that the supply of labor is increasing through new entrants and reentrants, and that competition for jobs is increasing. If the supply of people seeking jobs is increasing rapidly relative to the increase in labor demand, the probability of finding alternative employment for individuals already employed who are considering quitting will fall. Thus the worker will be less likely to leave his existing job.

The textile industry is not only labor intensive but is also characterized by low wages relative to the other industries in manufacturing. So changes in the labor supply would tend to have a greater impact on the textile industry than the manufacturing sector since unskilled entrants or reentrants could be absorbed immediately into the textile labor force.

The final labor market variable is the unemployment rate.[8] This correlate is a proxy for aggregate economic conditions, and also in-

dicates labor market job conditions. A relatively high unemployment rate is a signal that there is an excess supply of labor at the current wage and that the economy is operating below capacity. Competition for jobs and a sluggish economy reduce the likelihood that a worker who quits will find a job and, consequently, the individual is more likely to remain with his current employer. This would be especially true in a cyclically sensitive industry, like textiles, characterized by large lay-offs during downturns. Workers would want to hold onto their jobs so the decline in turnover will be more marked in textiles than in the manufacturing sector as a whole.

Two remaining variables included in the model are measures of labor force composition: the percentage of young workers and the percentage of female workers. Both of these are expected to cause higher relative turnover in textiles.

The labor force is becoming increasingly younger. Since 1958, the percentage of the labor force under the age of 25 has increased from 17.3 to 24.9. At the same time, employment of young workers has increased more rapidly in the textile industry than in the manufacturing sector. According to the *US Census of the Population*, the percentage of workers under the age of 25 years in the textile industry was 13.01% and 14.13% in the manufacturing sector in 1960. However, by 1970 workers under the age of 25 in the textile industry had grown to 18.04% whilethis age group in manufacturing had grown only to 17.28% of the work force.

Young workers tend to migrate from job to job until they find a suitable position, since the opportunity cost of being without work is low relative to that for older, more experienced and higher paid workers. So for a given stream of potential benefits, the younger worker invests more time and effort into search behavior. The end result of this increased search activity is a higher quit rate for young workers. Since the textile industry has a larger proportion of young workers than manufacturing in general, the relative quit rate should increase.

The labor force is also becoming increasingly populated by female workers. During the period from 1953 to 1977, the percentage of women in the labor force has grown from 29.2 to 40.2. This increase should have an especially strong impact on the textile industry. As can be seen from Table IV, the percentage of textile workers who are women is much higher than the percentage of manufacturing workers who are women. The proportion of women in textiles is consistently sixteen percentage points higher than the proportion in manufacturing in general.

As more females enter the labor force, we expect the quit rate in manufacturing and in textiles to increase. According to Becker (2), households make labor force supply decisions as a unit and, generally, the female enters and leaves the work force several times during the career cycle. Childbirth, relocation, augmentation of family income, and capital intensive equipment in the home all contribute to the flow of women in and out of the labor force.

Table IV

Comparisons of Female Employment

Year	% of Women in Textiles	% of Women in Manufacturing
1959	43.82	26.14
1960	43.43	26.03
1961	43.51	26.30
1962	43.70	26.56
1963	43.32	26.38
1964	43.52	26.26
1965	43.96	26.40
1966	44.37	27.13
1967	44.71	27.53
1968	44.50	27.75
1969	49.94	28.10
1970	45.97	28.15
1971	45.92	28.09
1972	45.92	28.56
1973	46.40	29.10
1974	46.47	29.14
1975	45.81	28.69
1976	46.12	29.51
1977	46.65	29.86

This data collected from *Employment and Earnings*.

The effect of the above influences causes the quit rate for females relative to that of males to be higher. Given the large number of women working in the textile industry, the relationship should be more pronounced. As the number of women seeking jobs increases, textile firms would tend to hire more of this increased supply. Hence, the relative quit rate will rise.

Data Collection and Statistical Analysis

Monthly data for the time period 1952 - 1975 were collected and converted to a quarterly basis in this study. For example in the case of the quit rate, monthly quit rates were averaged together to create a quarterly quit rate. All of the other variables were calculated in this same manner.

Once the data collection and conversion had been accomplished, a time-series regression analysis was used to test for the significant relationship. As indicated earlier, several of the independent variables are redundant, so serious multicollinearity was expected to exist in the model. The multicollinearity problem is demonstrated in Table V. To minimize this problem, all the possible permutations of the independent variables are considered on the dependent variable using the Goodnight stepwise maximum R^2 improvement procedure (from *SAS 1976*, a statistical analysis software package). This procedure looks for the "best" two-variable model, three-variable model, four-variable model, etc. The independent variable is selected in such a manner as to maximize the R^2. This is comparable to doing regressions on all the possible subsets and selecting the ones with the "best" fit.

To minimize the multicollinearity problem, the model is picked from the set of eight models ranging from one independent variable to eight such that there is a maximum number of variables all statistically significant to the .10 level.

The results of the initial statistical analysis are shown in Table VI. The model indicates that the relative wage, the accession rate in manufacturing, the rate of price increase, and the percentage of young workers in the labor force significantly affects the relative quit rate. There are also four insignificant variables in the model: the help-wanted advertising index, the labor force participation rate, the unemployment rate, and the percentage of the labor force composed of women. Each is insignificant at the .10 confidence level.

No doubt, some of the problem of lost significance is due to multicollinearity among the independent variables. As mentioned earlier, the Goodnight stepwise procedure was used to determine the best model. The model with all significant independent variables was a three-variable model.

In a separate regression, the three variables were introduced together, and the results are shown in Table VII. As with the previous full model, the high R^2 indicates considerable explanatory

Table V

Correlation Matrix for the Full Model

	QTM	W	AR	P	HWA	LFP	U	A	S
QTM	1.000	-0.563	0.104	0.518	0.520	0.583	0.516	0.749	0.842
W	-0.563	1.000	0.050	-0.160	-0.004	-0.091	-0.678	-0.165	-0.455
AR	0.104	0.050	1.000	0.316	0.575	0.406	-0.236	0.412	0.345
P	0.518	-0.160	0.316	1.000	0.671	0.778	0.200	0.745	0.749
HWA	0.520	-0.004	0.575	0.671	1.000	0.736	-0.219	0.826	0.756
LFP	0.583	-0.091	0.406	0.778	0.736	1.000	0.161	0.822	0.792
U	0.516	-0.678	-0.236	0.200	-0.219	0.161	1.000	0.218	0.414
A	0.749	-0.165	0.411	0.745	0.826	0.822	0.218	1.000	0.945
S	0.842	-0.455	0.345	0.750	0.756	0.792	0.414	0.945	1.000

Table VI

Regression Results for the Full Model

Variable	Beta Coefficient	Standard Error
Intercept[c]	3.113	1.890
W[a]	-4.690	1.672
AR[a]	-0.072	0.022
P[b]	-0.063	0.033
HWA[c]	0.001	0.001
LFP[c]	1.097	1.668
U[c]	0.034	0.027
A[a]	0.088	0.405
S[c]	-0.022	0.050

Durbin-Watson D = 0.9950

R^2 = 0.799

QTM = 3.113 - 4.690 W - 0.072 AR - 0.063 P + 0.001 HW + 1.097 LFP 0.034 U + 0.088 A -0.022S

a Significant at the .05 level.

b Significant at the .10 level.

c Significant at a level above .10.

Table VII

Regression Results From the Three-Variable Model

Variable	Beta Coefficient	Standard Error
Intercept	3.455	0.417
W	-4.663	0.534
AR	-0.067	0.019
A	0.080	0.006

Durbin-Watson D = 0.916
R^2 = 0.787
QTM = 3.455 - 4.663 W - 0.067 AR + 0.080 A

power in terms of these variables which accounts for quite a bit of the variation in the relative quit rate. However, a comparison of the Durbin-Watson Statistic with its tabular value indicates that positive autocorrelation exists. With 87 degrees of freedom, a statistic lying below the tabular value of 1.39 indicated that the error terms are positively correlated.

Within the Statistical Analysis System computer package is a procedure to correct this problem. This Autoreg procedure corrects the problem by lagging the error terms in a separate regression. For example, consider the model

$$Y_t = X_t B + U_t.$$

A new model is now constructed to estimate the residual where

$$U_t = E_t - a_1 U_{t-1} - a_2 U_{t-2} - \ldots - a_q U_{t-q}.$$

The term E_t represents the true error, which is normally and independently distributed with a mean of zero.[9] The model is then adjusted accordingly.

The results of the autoregression procedure are shown in Tables VIII and IX. Table VIII shows the correlation between the lagged error terms. The first four lags reveal correlated error terms. Each of these is correlated positively and at relatively high levels. With the fifth lag, however, the correlation becomes random and is insignificant.

This result is consistent with our expectations about quit behavior; i.e., while changes in labor market conditions of several months past might impact on the current quit rate, it is unlikely that changes from over one year earlier will affect quit behavior.

Using the autoreg procedure, a new model was determined. The adjusted model is shown in Table IX. These results reveal several changes from the earlier regressions. First, the R^2 has fallen, but this was not unexpected since the autocorrelation biases the R^2 upward.

In addition to the lower explanatory power, there is a reduction in the beta coefficients for the intercept and for the relative wage. These changes, however, are small and the variables retain their significance.

The beta coefficients have the predicted signs with the exception of the accession rate in manufacturing. In this case, the sign was expected to be positive, but the regression results indicate a negative relationship. Apparently, as the accession rate in general rises, the quit rate in manufacturing increases at a faster rate than does the quit rate in textiles.

Of the three variables found to significantly affect the relative quit rate in textiles, the relative textile wage is the most interesting to us. In addition, the wage rate is the one variable over which the firm can exert control.

To determine the degree of influence the textile employer has over his quit rate by changing wages, the elasticity of textile wages with respect to the textile quit rate can be computed. But first, the impact of changes in the relative wage rate on the relative quit rate

Table VIII

Correlation of the Lagged Error Terms

Lags	Correlations
0	1.000
1	0.541
2	0.279
3	0.259
4	0.345
5	0.123
6	-0.046
7	0.027
8	0.188

Table IX

Regression Results with Autoreg

Variable	Beta Coefficient	Standard Error
Intercept	2.725	0.683
W	-3.699	0.850
AR	-0.068	0.022
A	0.082	0.010

$R^2 = 0.517$

$QTM = 2.725 - 3.699\ W - 0.068\ AR + 0.082\ A$

will be examined so that an elasticity can be calculated for this relationship. Then the impact of changes in just the textile wage on relative quit rates will be examined and the corresponding elasticity can be determined. Lastly, the impact of the textile wage rate on just the textile quit rate will be examined to calculate a third elasticity. The mean values to be used are

QTM = 1.437,
QT = 2.599,
W = O.726,
TW = 1.99,
MW = 2.74,
AR = 3.954,
A = 20.318.

Using these mean values for each of the variables to be held constant, i.e., AR and A, the model becomes:

QTM = 2.725 − 3.699 (W) − 0.068 (3.954) + 0.082 (20.318).

Further simplified, this becomes

QTM = 4.122 − 3.699 (W).

Inserting the mean value for W in the equation yields a figure of 1.437 for QTM. When W is increased by 10%, the relative quit rate falls to 1.168. Thus a 10% increase in the relative textile wage will yield an 18.7% decrease in the relative quit rate.

Using similar analysis, the elasticity of the textile wage with respect to the relative quit rate can now be computed. The earlier derivation of the model now becomes

QTM = 4.122 − 1.35 (TW).

Again using the mean values, QTM is 1.436. When TW is increased by 10%, the relative quit rate falls to 1.167. A 10% increase in the textile wage again causes an 18.7% decline in relative quits.

In order to determine how the quit rate in the textile industry reacts to changes in the industry wage rate, we transform the model once again to

QT/QM = 4.122 − 1.35(TW)

where

QT = the textile quit rate and
QM = the manufacturing quit rate.

With insertion of the mean value of the manufacturing quit rate, the equation becomes

QT = 7.461 − 2.443(TW).

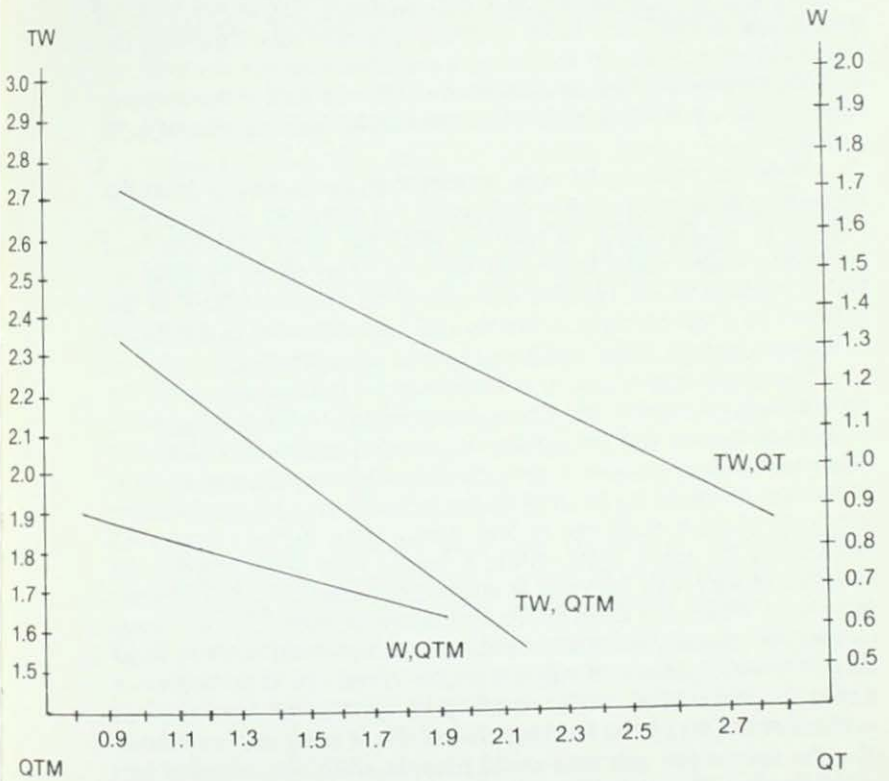
With this equation, a 10% increase in the textile wage rate causes the textile quit rate to fall from 2.599 to 2.112, or by 18.7%. So in each case, the elasticity is the same: 1.87. These wage-quit rate relationships are illustrated graphically in Figure I.

Summary and Conclusions

This study has had two purposes: (A) to develop a model of voluntary labor turnover in the textile industry, and (B) to determine how important the relative wage rate of the textile industry has been in determining the high relative turnover rates within the in-

Figure I

Wage - Quit Relationship



dustry. To accomplish these objectives, the quit rate in textiles relative to that in manufacturing was used as the measure of turnover and was used in the dependent variable in the constructed model. Initially, a model with eight independent, explanatory variables was specified to explain why labor turnover has been higher in the textile industry than in the manufacturing sector. With a full model established, monthly data was converted to a quarterly basis and used in a time-series regression analysis. The initial regression indicated that there were four significant variables, but multicollinearity problems existed as indicated by the high correlation coefficients.

In order to reduce the multicollinearity problem, the Goodnight stepwise maximum R^2 improvement procedure was employed. Use of this procedure provided a method of finding the one model with from one to eight variables which best explained the variation in the relative textile quit rate. The model which offered the "best" fit was a three-variable model with three significant variables: the relative textile wage, the accession rate in the manufacturing sector, and the percentage of the labor force under 25 years of age. However, the Durbin-Watson statistic indicated an autocorrelation problem, so the autoreg procedure was used to adjust for the first-order autocorrelation among the residuals. All three variables remained significant.

Once the final model was constructed, mean values from the regression data were used to determine the elasticity of wages with respect to relative quits in textiles. With the other variables held constant, wages were increased by 10%, and there resulted an 18.7% decline in the relative quit rate. The responsiveness of the quit rate to wage changes indicates that quit behavior in the textile industry is indeed quite sensitive to wage adjustments.

There remains a number of subjects for further research. As shown here, relative wages are an important variable in influencing relative quit rates, but the textile industry has apparently chosen to allow high turnover since wages could have been adjusted upward to reduce the problem. So firms in the industry may still be minimizing costs if high turnover is less costly than higher wages. An analysis of the labor costs within a textile firm might answer the question of why high turnover is allowed to persist. Studies of other industries which are more capital intensive or with different wage structures should provide additional information about wage elasticity with respect to industry quit rates. Another approach would be the use of the probability of quitting as a dependent variable.[10] A comparison between the results of using the probability of quits versus the quit rate could provide additional insights into quit behavior. These studies and others can add much to the limited knowledge of textile labor turnover.

FOOTNOTES

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2. Magnus Hedberg. 1967. *The Process of Labor Turnover.* Stockholm: Swedish Council for Personnel Administration. p. 14.

   Herbert S. Parnes. 1954. *Research on Labor Mobility.* New York: Social Science Research Council. p. 23.

3. James L. Price. *The Study of Turnover.* Ames, Iowa: Iowa State University Press. 1977. p. 13.

4. While the textile data is included within the manufacturing data, textiles is such a small portion of the manufacturing data that it is not expected to bias the data.

5. James L. Price. pp. 68-70.

6. The expected decline in real income is based upon the length of the work-week being about the same in textiles as in manufacturing. Also, non-wage benefits in textiles have tended to lag behind those in manufacturing which further strengthens the argument that the real incomes of textile workers relative to manufacturing have declined.

7. For example, workers who are trained to be machine operators and fixers will have certain basic mechanical skills which can be utilized in other manufacturing areas.

8. It is expected that several of the proxies for labor market conditions will be highly correlated. However, it was decided to go ahead and specify all of the variables expected to have an influence. Then statistical analysis is used to eliminate the redundancy.

9. Jane T. Helwil and Kathryn A. Council. 1979. *SAS User's Guide.* Raleigh: SAS Institute, Inc. p. 131.

10. Using the same independent variables specified in our model, the dependent variable would be transformed. The model becomes

$$\ln (Q_t/1 - Q_t) = B_0 + B_1W_t + B_2AR_t + B_3P_t + B_4HWA_t + B_5LFP_t + B_6U_t + B_7A_t + B_8S_t$$

where

Q_t = quit rate in the textile industry.

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