New Market Power Models and Sex Differences in Pay

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Abstract.

We use a simple framework, adopted from general equilibrium search models, to estimate the extent to which monopsony power (or labor market frictions) can account for gender differences in pay at a chain of regional grocery stores. In this framework, the elasticity of labor supply to the firm can be inferred from estimates of the elasticity of the separation rate with respect to the wage. We identify elasticities of separation from differences in wages and separation rates across job titles and across different years. We estimate elasticities of labor supply to the firm of about 2.5 for men and about 1.6 for women, suggesting significant wage-setting power for the firm. The differences in elasticities predict gender wage differentials that are close to the estimated gender wage differentials at the firm.

I. Introduction

In one of the earliest explanations of the "gender gap" in wages, Joan Robinson (1969, pp. 224-27) showed that if an employer is a monopsonist and the elasticities of labor supply of men and women differ, it is profitable for employers to engage in wage discrimination, paying higher wages to the group with the higher elasticity of supply. Although Robinson's model appears in many economics textbooks, the discussion of it is usually skeptical, as it is based on the assumption of a pure monopsony--a single employer of labor in a market--and this seems at odds with the marketplace that we observe almost everywhere. Perhaps for this reason, models of monopsony have not been very influential in the economics literature on labor market discrimination in the past forty years, which has focused primarily on explaining how discriminatory wage differences could occur in competitive markets, with much of this literature following Becker (1971).

However, some recent models of labor markets suggest that employers may have market power, even when there are numerous employers. In fact, this is not an entirely new idea. Samuelson (1958) in an early edition of his principles textbook noted the following about the wage policies of companies:

> … In a perfectly competitive market, a firm need not make decisions on its pay schedules; instead it would turn to the morning newspaper to learn what its wage policy would *have* to be. Any firm, by raising wages ever so little, could get all the extra help it wanted. If, on the other hand, it cut the wage ever so little, it would find no labor to hire at all in a perfectly competitive labor market.
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> ... The world … is a blend of (1) competition, and (2) some degree of monopoly power over the wage to be paid. If you try to set your wage too low, you will soon learn this. At first nothing much need happen; but eventually you will find your workers quitting a little more rapidly than would otherwise be the case. Recruitment of new people of the same quality will get harder and harder …

The ideas expressed in these paragraphs have been formalized cleverly in the general equilibrium search model of Burdett and Mortensen (1998). Individual firms, although "small"

with respect to the labor market, face labor supply curves that slope upward in exactly the way that Samuelson described. The implications of this model for labor market monopsony have been explored in some detail in a recent book by Manning (2003). Boal and Ransom (1997) refer to these and related models as "dynamic monopsony," because they stress the dynamic nature of the labor market. Essentially, these models formalize the idea that labor market "frictions" can have an important impact on the operation of the market.

An implication of the Burdett/Mortensen/Manning models is that the labor supply curve to the firm is related to its wage elasticity of separations. In this paper, we use this relationship as a framework within which to estimate the labor supply curve to an individual firm (a retail grocer), taking advantage of the differences in wages and separation rates across different job titles. We find that the elasticity of labor supply to the firm does differ between men and women employees, and that this is difference is consistent with profit-maximizing discrimination by the firm.

II. A Model of Labor Market Monopsony

Here we present a brief version of the general equilibrium search model of Burdett and Mortensen (1998), following closely the notation and presentation of Manning (2003, Sections 2.2 and 4.4). Firms have identical constant returns to scale production functions, with average and marginal product of workers equal to p. Workers are also identical, and each has the same value of leisure, b. Some workers are employed and others are unemployed. Workers and potential workers receive job offers from a distribution F(w) at rate λ. An employed worker accepts the offered wage if it is greater than his or her current wage. An unemployed worker accepts any offer greater than b. (In equilibrium, no firm will offer a wage less than b, so this means that an unemployed worker will accept any job offer.) Jobs are also exogenously randomly destroyed at rate δ.

In equilibrium, all firms earn the same profit,

$$\pi = (p-w)N(w;F),$$

but there is wage dispersion in equilibrium, described by the distribution F(w). Firms that offer higher wages employ more workers, so the labor supply function to the firm, N(w) is positively sloped. The distribution of wages across employees who are employed is G(w). G(w) differs from F(w) because workers are more likely to work for high wage firms. The relationship between F(w) and G(w) is described by the following equation:

(1) $G(w; F) = \delta F(w)/\{ \delta + \lambda[1-F(w)]\}$.

This model yields the standard "monopsony" results–that the labor supply curve to the firm is upward sloping (because in order to have a larger workforce, a firm must offer a higher wage), and that all workers, even those at the highest wage firms, are paid less than the marginal product of labor.

In this paper we exploit the dynamic nature of employment in the context of the equilibrium search model to identify the firm's labor supply elasticity. In equilibrium, the flow of recruits to the firm just balances those who leave the firm:

(2) $s(w; F)N(w; F) = R(w; F)$ or, $N(w; F) = R(w; F)/s(w; F)$

where s(w) is the separation rate at the specific wage, and R(w) is the number of recruits.

In terms of the parameters of the model, the separation rate is

(3) $s(w; F) = \delta + \lambda [1 - F(w)]$:

employees leave the firm either because they lose their job or leave the labor market (the first term), or move to a different employer in response to a better job offer (the second term). The elasticity of the separation rate with respect to the wage is

(3a) $\varepsilon_{sw} = -\lambda w f(w)/s(w)$.

The recruitment function can be written as:

(4) $R(w; F) = R^U + \lambda \int^w f(x)N(x)dx$,

where R^U is the recruitment from the unemployed (which does not depend on the wage offered), and the second term of the expression reflects the number of recruits hired from employers with lower wages. The elasticity of the recruitment function with respect to the wage can thus be written as:

(4a) $\varepsilon_{Rw} = \lambda w\, f(w)N(w)/R(w)$.

Since the flow of recruits must equal the flow of separations in steady state, as stated in equation (2), $s(w) = R(w)/N(w)$, so (3a) is simply the negative of (4a):

(5) $\varepsilon_{Rw} = -\varepsilon_{sw}$.

This is intuitive, since one firm's recruitment is another firm's separation. Rewriting the equilibrium condition from (2) in terms of the elasticities, and (5), we have

(6) $\varepsilon_{Nw} = \varepsilon_{Rw} - \varepsilon_{sw} = -2\, \varepsilon_{sw}$.

Thus, the elasticity of labor supply to the firm is just twice (the negative of) the separation elasticity. We exploit this because it is conceptually and practically much easier to estimate the elasticity of separation than it is to estimate the elasticity of recruitment. It is this relationship that makes it possible for us to estimate the elasticity of labor supply to the firm.

III. The Firm

The data we analyze comes from a regional grocery retailer in the western United States. We have year-end employment and wage data for the retail employees of the firm between 1976 and 1986. (By retail employees, we mean those who worked in the retail operations of the grocery stores themselves. Accountants, company officers, truck drivers, and the like, are not included in our analysis.)

Table 1 summarizes a few of the characteristics of the firm during the time period that we

analyze. The firm operated between 54 and 61 stores, and had between about 1500 and 2000 employees. The number of stores and employees fluctuated, increasing early, then declining. During this period the firm opened several new stores and closed several old ones. Many of the company's retail employees worked part time, with the prevalence of part-time work increasing noticeably over the period of our analysis. About 40 percent of employees were female, and this fraction remained fairly constant.

Figure 1 presents a simple organizational chart for employees of the company's retail operations. Each store had three "management" positions: the store manager, the assistant manager, and the relief manager. The rest of the workers were paid on an hourly basis. The largest group of these workers held the title of "food clerk." Food clerk assignments included stocking shelves and operating cash registers. "Produce clerks" had the same pay scale as food clerks but worked in the produce department. "Variety clerks" stocked shelves in the non-foods department, but earned less than food clerks. Some stores had other departments, such as delis or bakeries--workers from those departments are included in the "Other" category. Courtesy clerks bagged and carried groceries. The produce and meat departments had "managers" who received a pay premium but were part of their bargaining units. The night crew chief supervised stocking operations during the hours the stores were closed, and also received a premium.

In Figure 1, the vertical position of the job title roughly shows the relative pay of each position. Courtesy clerks earned slightly more than the legal minimum wage. Variety clerks and "other" employees were paid substantially less than food clerks. The jobs on the bottoms of the ladders were entry level positions. Courtesy clerks were sometimes promoted into one of the other clerk positions, but most were short term employees. There was some mobility between the different departments of the store, but meat department employees almost never changed departments. Most of the management positions were filled from within the store ranks by

promotion, and this was true, to some extent, even of the store manager job.

In another paper, we examine job mobility within the store and its implications for pay differentials between men and women (Ransom and Oaxaca, 2005). That paper also provides more details about the organization of employment within the store. It is clear that the meat department employees had special skills. However, the other employees were, apparently, mostly trained on the job. According to a supplementary survey of a small sample of employees, most were high school graduates with little or no college training. Analysis of that sample showed that formal educational credentials were unimportant in determining job placement and promotion.

All non-management retail employees (including the department "managers") were covered by collective bargaining agreements. One contract covered the meat department employees, and another covered the other employees. We have examined the contract of one of the locals, which was affiliated with the United Food & Commercial Workers Union. This was a multi-employer agreement that covered several other employers in the region. Basically, the contract dictated pay, hours scheduling, benefits and working conditions. The contract specified the wage levels for each of the job titles at the store, including seniority increments. However, it did not restrict the employer in terms of whom it could hire, nor did it place restrictions on whom the employer could place in a particular job. For example, if the employer chose to promote a courtesy clerk to the food clerk position, the contract required only that the most senior courtesy clerk be considered for the job. Movements between departments were quite rare, but were at the discretion of the employer.

In the early 1980s, several women initiated a class-action lawsuit, alleging that the employer had discriminated against women in job assignment (particularly in promotion to management), and in part-time/full-time work assignments. The court found the defendant guilty

of discrimination in 1984, and the two parties reach a negotiated settlement in mid-1986 on terms of backpay and affirmative relief. However, the affirmative relief outlined in the settlement did not take place during the period of our analysis. Nevertheless, we might expect that the lawsuit itself may have had some impact on employment practices at the firm.

IV. Wage Differentials

Table 2 reports several regressions that summarize the differences in hourly wages of men and women in non-management jobs in 1980. The regression results in Column I show that there was no overall gender difference in hourly wages. However, women at this firm were older and had more seniority than men. Column II shows that when men and women of the same age and seniority are compared, women were paid about 11.3 percent less than men. Column III shows that when job title is included in the analysis, the wage gap falls to only about 1.8 percent, although the difference is still statistically significant. (We include Column IV simply to show that job title alone explains about 84 percent of the variation in wages.) The preceding analysis understates the size of the pay gap because it considers only hourly workers. The high-pay management jobs were held almost exclusively by men in 1980. The results in column IV also provide a good summary of the average wage of each of the positions, relative to courtesy clerks. For example, food clerks earned about 15 percent more than variety clerks, and variety clerks earned about 15 percent more than "other" employees. All of these employees earned substantially more than courtesy clerks. Table 3 shows the distribution of men and women across the various job titles in the company for year-end 1980.

The regression results of Table 2 are not the least bit surprising–we know that wages are set by job title according to the collective bargaining agreement. However, the analysis does make clear that the wage differential in the workplace is basically an issue of which job

assignment an employee receives. Thus, the question we have to answer is this: "Why are women assigned to the jobs with lower pay?" We believe that monopsonistic wage discrimination provides an answer.

V. Data

Our strategy here is to estimate the elasticity of labor supply to the firm by estimating the elasticity of separations, as specified in equations (5) and (6). The data we use come from year-end payroll files of the firm. These data include the pay rate and job title of the employee's current job, earnings for the past year, date of hire and date of birth. Each year-end file contains a record of all employees who worked for the firm during the year, even though they may have terminated their employment before the end of the year. By matching consecutive years, we can identify those who stopped working for the firm during a given year. We have pooled workers for all years between 1977 and 1985. (We lose the first and last year because we cannot identify separation dates from the year-end files directly.) According to our definition, a separation occurred in year t if someone was employed at the end of year t-1, and was no longer employed at the end of year t. We do not know the reason for the separation. We assume that virtually all of these are quits, but surely, some would have been dismissals, retirements, or the like.

We analyze two time periods. First, we use the entire sample of nine years. Next, we use a shorter sample of 6 years, from 1977 through 1982, since we have some concerns about how the lawsuit influenced employment practices. Table 4 presents summary statistics for the data we use in our analysis. The turnover rate over this period was fairly high–about 16 percent of the workforce left the employer each year, on average. Most of the variables appear to be quite similar across time periods used in the analysis.

VI. Estimation of the Elasticity of Labor Supply to the Firm

In order to infer the labor supply elasticities to the firm, we must first estimate the elasticity of the separation rate with respect to the wage. This can be calculated from a probit regression model of the form:

$$(7) \qquad s_{it} = \Phi(\alpha_0 + \alpha_1 \ln(w_{it}) + \alpha_2 \ln(w_{it})*FEMALE_i + X_{it}B) = \Phi(I_{it})$$

where s_{it} is the probability that an individual separates from the firm during the year, $\Phi(I_{it})$ is the normal cumulative distribution function evaluated at I_{it}, W_{it} is the real wage at the start of the year, FEMALE is an indicator equal to 1 if the worker is female, and X represents a vector of other explanatory variables.

We have estimated three versions of this model for each of the sample periods. Model I includes only the female indicator and powers of age as the "other" explanatory variables. Age is included to capture differences in labor market experience, which might reflect differences in the skills of the workers. Model II additionally includes tenure with the firm and its square. It is not clear that tenure ought to be included in a model of separations, but since some promotion and job assignment decisions may be based on seniority, we include these here.[1]

In the last version of the model, we have also included dummy variables for each of the years. We include these because if the firm opens new stores, or closes stores in a given year, this may have an impact on separations, independent of the wage structure. Also, the business cycle may influence the other opportunities of workers within the firm. We do find that separations varied quite a bit from year to year, and that the rate was especially high during the last year of our analysis. However, the coefficients that we are most interested in change very

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[1]One alternative model of separations is a matching model in which those who find a good match at the firm stay with the firm, while those who do not match will leave the firm quickly. If there is a seniority component to the wage, then this would appear to make separations sensitive to the wage, when in fact they are not. However, our estimates of the

little across the different specifications of the model.

Table 5 reports the results of our estimation. Most of the variables are strongly related to the separation probabilities. The age variable enters as a cubic, but over the range from about 20 years old to 50 years old, the probability of separation decreases with age, as expected. The tenure variable enters as a quadratic. The probability of separation decreases with tenure for the first 15 or 20 years (depending on version and sample period), then it increases with tenure. The log wage coefficients are somewhat larger for the "Early Years" sample, and the female-wage interaction term is much larger for the early sample.

The separation elasticities for men can be calculated from the estimates of equation (7) in the following way:

$$(8) \qquad \varepsilon_{sw}^{m} = \frac{w}{s}\frac{\partial s}{\partial w} = (\frac{w}{s})(\frac{\alpha_1}{w})\phi(I) = \alpha_1(\frac{\phi(I)}{\Phi(I)}) \ ,$$

where I is the value of the index function that is estimated in the probit regression. In similar fashion, the separation elasticity for women can be calculated as:

$$(9) \qquad \varepsilon_{sw}^{mf} = (\alpha_1 + \alpha_2)(\frac{\phi(I)}{\Phi(I)}) \ .$$

The ratio, $\varphi(I)/\Phi(I)$, that appears in this equation is sometimes called the inverse Mill's ratio.

In the context of our version of the Burdett/Mortensen/Manning model, the elasticity of labor supply to the firm is simply twice the negative of the separation elasticity, as derived in equation (6). However, because of the nonlinearity of the probit regression model, there is some ambiguity as to how to calculate "the" elasticity of labor supply to the firm. We adopt two approaches that are often used to evaluate the results of probit regressions. In the first, Method A, we evaluate the elasticity at the sample mean of the explanatory variables. That is, we evaluate the index function, I, using for the explanatory variables the overall sample means of

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separation elasticities are not very sensitive to whether tenure is included in the model.

each variable. The top panel of Table 6 reports the results of method A. The second method (Method B) evaluates the elasticity for each individual in the sample, then averages those individual estimates for men and women. The lower panel of Table 6 reports results using this method.

The monopsony model of wage discrimination provides predictions of male/female wage differences, under the assumption that the firm is otherwise unconstrained. If we express the wage bill for the jth group of workers as $N_jW(N_j)$, the marginal cost of hiring a worker of type j is

$$MLC_j = w_j(1 + \frac{1}{\varepsilon_{Nw}^j})$$

The employer maximizes profits by setting MLC_f equal to MLC_m, so

$$(10) \qquad w_f(1+1/\varepsilon_{Nw}^f) = w_m(1+1/\varepsilon_{Nw}^m),$$

and therefore the ratio of female to male wages is

$$(11) \qquad w_f / w_m = (1+1/\varepsilon_{Nw}^m)/(1+1/\varepsilon_{Nw}^f).$$

The logarithm of this ratio corresponds to the estimated log wage gap of $\ln(w_f) - \ln(w_m)$. The wage ratio and the log wage gap are also reported in Table 6.

It is informative to compare the wage gaps in Table 6, which are derived from the estimated elasticities of labor supply to the firm, with the wage gaps estimated directly in column II of Table 2, for year-end 1980. (The "early years" sample period ends in 1982, so these results are the most relevant.) The monopsony model yields estimates of the log wage gap of 15.1 or 14.4 percent, which are not dramatically greater than the unexplained wage gap of 11.3 percent reported in Table 2. Even if our measures of labor supply to the firm are correct, this firm is constrained in setting wages by a collective bargaining agreement. That the monopsony model "overpredicts" the wage gap in this setting is unsurprising.

The traditional measure of monopsony power is called Pigou's exploitation index. It is defined as

$$E = \frac{MRP_L - w}{w} = \frac{1}{\varepsilon_{Nw}},$$

where MRP_L is the marginal revenue product of labor. E measures the percentage deviation of the market value of the worker's output from his or her wage. (This corresponds directly to the Lerner index used to measure monopoly power.) As shown by Boal and Ransom (1997) and others, this is just the inverse of the labor supply elasticity to the firm. Our estimates indicate that this firm has substantial market power—values of E are around 0.4 for men and almost 0.6 for women. However, this result does not imply that the wages we observe at this firm would increase by 40 to 60 percent if market information were suddenly made perfect, since the firm we examine is obviously constrained in wage setting. Its wage making power is tempered by the wage setting power of its workers.

We note in passing that the log wage gap is approximately the difference between the exploitation indexes. From (11) above,

$$(12) \qquad \ln(w_f) - \ln(w_m) = \ln(1 + 1/\varepsilon_{Nw}^m) - \ln(1 + 1/\varepsilon_{Nw}^f) \approx 1/\varepsilon_{Nw}^m - 1/\varepsilon_{Nw}^f = E_m - E_f .$$

if the exploitation is small (or the elasticity of labor supply to the firm is large). This approximation is not very accurate for our particular example, however, as our estimated elasticities are quite small.

VII. Discussion

In the argument above we have taken a very static, "Robinsonian" approach to the interpretation of the elasticity of labor supply to the firm, which requires some formal departures from the search model that we used to motivate the analysis. For example, in the Burdett-

Mortensen-Manning (BMM) model, each firm offers a single wage, while our objective is to examine within-firm wage differences. In BMM, productivity is determined by the firm (or perhaps the job) while our regression models, at least in spirit, assume there are productivity differences across individuals.

Essentially, the elasticity that we estimate is a reduced form. The structural parameters of the underlying search model determine the elasticity, but we are unable to estimate these parameters directly with the data available to us. If the elasticities of men and women differ, it must be because of differences in one or more of these parameters. For example, the female elasticity may be smaller because women have a lower value of λ, the arrival rate of job offers. Such a difference could arise because women have a less effective network of contacts, for example, but could also reflect less intensive search by women, or relatively less intensive recruiting of women by employers. Some of these causes might be thought of as discrimination, but others could be benign. Thus, job search models provide several possible alternative explanations for male/female wage gaps.

For example, Bowlus (1997) estimates the "primitive" parameters of a generalization of the Burdett-Mortensen model using data from the National Longitudinal Survey of Youth. She argues that gender differences in the parameters of the search model can explain a substantial part of the observed difference in wages.[2] It is interesting to note that in the context of her model, there is no discrimination by employers, even though elasticities of labor supply differ by sex--each employer offers the same wage to all workers, but the equilibrium wage distribution of women has a lower expected value.[3] In the spirit of Bowlus' approach, wage differences at our firm could arise because women "stick" in low wage jobs, while men are more likely to move on

[2] For technical reasons, Bowlus assumes that men and women do not work for the same employer. That is, workers either hire all men or all women.

[3] Mortensen (2003) is an example of an empirical study that examines the monopsony issue within the context of an equilibrium search model. However, his paper does not address male/female differences in wages.

to higher pay jobs, without any effort by the employer to take advantage of their monopsony position.

Another issue that deserves discussion is the notion of how the firm exercises monopsony power within its institutional context. Each job title at the firm is connected to a specific contractual wage, with associated seniority steps. The differences across job titles allow us to identify the separation elasticity with respect to the wage under the assumption that working conditions are not very different across jobs and that we can identify individual differences in ability with the few variables that we have at our disposal. Thus it is perhaps more accurate to talk of the elasticity that we estimate as a "notional" elasticity—the labor supply elasticity that the firm would face in the absence of labor market institutions like unions. Thus the firm has monopsony power, but optimizes subject to institutional constraints.

Within the limits of the data available to us, we have estimated the elasticities of labor supply to the firm for men and women. We have no reason to believe that the elasticity of labor supply that this firm faces would be much different than that faced by other similar firms in the labor markets in which it operates. Therefore, our results suggest monopsony power due to labor market frictions could be an explanation for difference in pay between men and women.

VIII. Summary and Conclusions

In this paper we have estimated the sensitivity of separations to the wage rates offered to different employees within a regional grocery chain. Within the context of an equilibrium search model, these results inform us about the elasticity of labor supply that the firm faces. Our results suggest an elasticity of about about 2.5 for men and about 1.6 for women. This indicates that firms have significant monopsony power, although this monopsony power would likely be tempered by labor market institutions, like unions, or by labor market regulations. The

difference in the labor supply elasticities of men and women suggests a role for monopsony power in explaining male/female difference in pay. In fact, the differences in elasticities in our study predict reasonably well the unexplained gender wage gap that we observe.

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Table 1
Company Characteristics
Retail Operations
Selected Years (as of 31 December)

Year	**1977**	**1980**	**1982**	**1985**
Number of Stores	59	61	58	54
Number of Retail Employees	1522	1968	1820	1533
Percent of Employees who are Female	37.5	41.2	40.8	41.8
Percent of Employees Part Time	42.1	55.1	56.9	62.6
Average Age	32.5	32.2	33.4	34.9
Average Seniority	6.0	5.8	7.1	8.9

Table 2

Regression Results for Hourly Workers, 1980
Dependent Variable is Logarithm of Hourly Wage
(Standard Errors are in Parentheses)

	I	II	III	IV
Intercept	1.901	0.2600	0.807	1.063
	(0.017)	(0.058)	(.029)	(0.007)
Female	0.0016	-0.113	-0.0183	0.017
	(0.013)	(0.012)	(0.009)	(0.009)
Seniority	.	0.046	0.0286	.
	.	(0.003)	(0.002)	.
$(Seniority)^2$	.	-0.0016	-0.00094	.
	.	(0.0001)	(7.61E-05)	.
Age	.	0.085	0.0172	.
	.	(0.003)	(0.002)	.
$(Age)^2$	.	-0.0010	-0.0002	.
	.	(4.37E-05)	(2.45E-05)	.
Food Clerk	.	.	0.7582	0.902
	.	.	(0.0119)	(0.009)
Night Crew Chief	.	.	0.8794	1.040
	.	.	(0.0155)	(0.009)
Produce Manager	.	.	0.8231	1.065
	.	.	(0.0170)	(0.009)
Produce Clerk	.	.	0.7787	0.927
	.	.	(0.0180)	(0.018)
Meat Manager	.	.	0.9506	1.212
	.	.	(0.0158)	(0.007)
Meat Cutter	.	.	0.9936	1.180
	.	.	(0.0141)	(0.007)
Meat Wrapper	.	.	0.8848	1.054
	.	.	(0.0143)	(0.010)
Variety Clerk	.	.	0.6022	0.743
	.	.	(0.0151)	(0.018)
Other	.	.	0.4624	0.580
	.	.	(0.0345)	(0.045)
Courtesy Clerk	.	.	.	.
	.	.	.	.
R^2	0.000	0.552	0.883	0.839

Table 3

Distribution of Men and Women Across Jobs
Year-end 1980

	Women Holding Title	Fraction of All Women	Men Holding Title	Fraction of All Men
Store Manager	0	0.000	55	0.475
Assistant Manager	2	0.003	50	0.043
Relief Manager	2	0.003	52	0.045
Food Clerk	559	0.634	432	0.373
Night Crew Chief	2	0.003	44	0.038
Courtesy Clerk	69	0.085	155	0.134
Produce Manager	0	0.000	57	0.049
Produce Clerk	6	0.007	99	0.086
Meat Manager	0	0.000	57	0.049
Meat Cutter	6	0.007	146	0.126
Meat Wrapper	78	0.096	4	0.004
Variety Clerk	74	0.091	1	0.001
Other	13	0.016	5	0.004
Total	811	1.000	1157	1.000

Table 4
Summary Statistics for Grocery Store Data

A. Full Sample (1977-1985)
Sample size = 14,398

Variable	Mean	Standard Deviation	Minimum	Maximum
Separated	0.16	0.37	0.00	1.00
Age	32.74	12.61	16.04	74.63
Tenure	6.02	5.81	0.02	3.83
Female	0.44	0.50	0.00	1.00
Wage (nominal)	7.34	2.56	1.96	12.46
Wage (1977 Dollars)	5.04	1.38	1.60	7.10
Fraction of sample from each year				
Year 1977	0.095			
Year 1978	0.095			
Year 1979	0.104			
Year 1980	0.120			
Year 1981	0.125			
Year 1982	0.126			
Year 1983	0.115			
Year 1984	0.111			
Year 1985	0.108			

B. Early Years (1977-1982)
Sample Size 9,566

Separated	0.16	0.37	0.00	1.00
Age	32.16	12.81	16.03	71.63
Tenure	5.38	5.58	0.03	34.54
Female	0.43	0.50	0.00	1.00
Wage (nominal)	6.38	2.05	1.96	10.82
Wage (1977 Dollars)	4.86	1.33	1.76	6.79
Fraction of Sample from Each Year				
Year 1977	0.143			
Year 1978	0.143			
Year 1979	0.156			
Year 1980	0.181			
Year 1981	0.189			
Year 1982	0.189			

Table 5
Probit Regression Estimates of Separations

	All Years (Sample Size = 14,398)			Early Years Only (1977-82) (Sample Size = 9,566)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Intercept	-0.5809	-0.6205	-0.2560	-0.9623*	-0.9679*	-0.9325
	(0.4395)	(0.4443)	(0.4576)	(0.4839)	(0.4879)	(0.3597)
Log(W) (real wage)	-0.8909	-0.7423	-0.7225	-.9398**	-.7931**	-0.7971**
	(0.0616)	(0.0640)	(0.0648)	(0.07366)	(0.0772)	(0.0782)
Female * Log(W)	0.1611	0.1780	0.1724	0.2917**	0.3069**	0.2913*
	(0.0709)	(0.0713)	(0.0708)	(0.08277)	(.0930)	(0.0927)
Female	-0.1905	-0.2326	-0.2263	-0.3617**	-0.3996**	-0.3757
	(0.1087)	(0.1091)	(0.1087)	(0.1383)	(0.1388)	(0.1384)
Age	0.1286	0.1235	0.1105	0.1640**	0.1563**	0.1592**
	(0.0440)	(0.0444)	(0.0455)	(0.0485)	(0.0489)	(0.0500)
$Age^2/10$	-0.0488	-0.0464	-0.0432	-0.0579**	-0.0551**	-0.0558**
	(0.0119)	(0.0121)	(0.0124)	(0.0131)	(0.0132)	(0.0135)
$Age^3/1000$	0.05089	0.0489	0.0465	0.0582**	0.0558**	0.0563**
	(0.0102)	(0.0104)	(0.0106)	(0.0111)	(0.0113)	(0.0115)
Tenure		-0.0554	-0.0616		-0.0578**	-0.0592**
		(0.0077)	(0.0078)		(0.0078)	(0.0100)
$Tenure^2$		0.0017	0.0019		0.0021**	0.0021**
		(0.0003)	(0.0003)		(0.0003)	(0.0004)
Year Indicators	No	No	Yes	No	No	Yes
Log Likelihood	-5,67719	-5,642.33	-5,629.6	-3797..81	-3780.24	-3768.13

Standard Errors are in parentheses. ** indicates the coefficient is statistically significantly different from 0 at the 1 percent level, * at the 5 percent level.

Table 6
Estimates of Labor Supply Elasticity to the Firm

Method	Estimates from All-Years Sample	Estimates from Early-Years Sample
A. At Mean of Sample Characteristics		
Men	2.347	2.543
Women	1.765	1.614
Implied female/male wage ratio	0.910	0.860
$\ln(w_f)-\ln(w_m)$	-0.094	-0.151
B. Sample Mean of Individualistic Estimates		
Men	2.352	2.550
Women	1.792	1.645
Implied female/male wage ratio	0.915	0.866
$\ln(w_f)-\ln(w_m)$	-0.089	-0.144

Method A evaluates the elasticity of labor supply to the firm at the mean values of the explanatory variables. Method B evaluates the elasticity of labor supply for each individual in the sample, then averages over individuals.

Figure 1
Organization of Store Level Employees