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Michael R. Ransom
Ronald L. Oaxaca

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Michael R. Ransom
Brigham Young University
and IZA Bonn

Ronald L. Oaxaca
University of Arizona
and IZA Bonn

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IZA

P.O. Box 7240
53072 Bonn
Germany

Phone: +49-228-3894-0
Fax: +49-228-3894-180
Email: iza@iza.org

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ABSTRACT

Sex Differences in Pay in a "New Monopsony" Model of the Labor Market*

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, using data from 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 3.5 for men and about 2.7 for women, suggesting significant wage-setting power for the firm. The differences in estimated elasticities of labor supply predict wage differences that are close to the observed male/female wage differences at the firm.

JEL Classification: J42, J71

Keywords: monopsony, gender, discrimination

Corresponding author:

Michael R. Ransom
Department of Economics
Brigham Young University
130 Faculty Office Building
Provo, Utah 84602-2363
USA
Email: ransom@byu.edu

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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 to be 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 employers are numerous. One of the most influential of these, and the foundation for the analysis in this paper, is 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 because workers must search for jobs (or employers must search for workers). The monopsony implications of this model 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.

In an application of an equilibrium search model to labor market discrimination, Black (1995) examines how some employers' tastes for discrimination may result in equilibrium wage differences between groups. Basically, Black's model permits Beckerian type tastes of some employers to influence the wage outcomes in the general labor market. In contrast, our approach is essentially Robinsonian--employers have no prejudice, but pursue wage discrimination simply because it is profitable.

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 difference is consistent with profit-maximizing discrimination by the firm.

II. A Model of Labor Market Monopsony

Here we present a simple 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:

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

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 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:

$$(2) \qquad s(w; F)N(w; F) = R(w; F) \text{ or, } N(w; F) = R(w; F)/s(w; F)$$

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

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

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

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

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 recruit is another firm's quit. Rewriting the equilibrium condition from (2) in terms of the elasticities, and (5),

(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. Janitors, accountants, truck drivers, and the like, are not included in

our analysis.) Table 1 summarizes some of the characteristics of the firm during the time period that we analyze. The firm operated between 55 and 60 stores, and had between 2200 and 2500 employees. The number of stores dropped slightly over the time period, while the number of employees increased. During this period the firm opened several new stores and closed several old ones. Many of the firm's employees worked part time, and part-time work became more prevalent over time.

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 mostly these 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.

Table 2 summarizes the characteristics of individuals in each job as of the end of 1982, near the middle of the period that we analyze. (The earnings variable is calculated only for those who held the same job title during the entire year, but the other statistics are for all those who held the job title as of December 31, 1982.)

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 here. Nevertheless, Ransom and Oaxaca (2005) finds evidence that the lawsuit itself may have had some impact on employment practices at the firm.

IV. Wage Differentials

Table 3 reports several regressions that summarize the differences in hourly wages of men and women in non-management jobs. The regression results in Column I show that the wage of the average woman was about 8.5 percent *more* than of the average man. 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 7.8 percent less than men. Column III shows that when job title is included in the analysis, the wage gap falls to only about 1.3 percent, although the difference is still statistically significant. (We include Column IV simply to show that job title alone explains about 95 percent of the variation in wages.) The preceding analysis understates the size of the wage gap because it considers only hourly workers. The high-pay management jobs were held almost exclusively by men in 1982. Table 4 shows the distribution of men and women across the various job titles in the company for year-end 1982.

The regression results of Table 3 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 do women get the low-pay jobs?" We believe that monopsonistic wage discrimination may provide 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 at least a few would have been dismissals, retirements, or the like.

We analyze two 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 5 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

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:

$$(7) \qquad s_i = \Phi(\alpha_0 + \alpha_1 \ln(w_i) + \alpha_2 \ln(w_i)*FEMALE_i + X_iB) = \Phi(I_i)$$

where s_i is the probability that an individual separates from the firm during the year, $\Phi(I_i)$ is the normal cumulative distribution function evaluated at I_i, W_i 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

[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 well 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

last year of our analysis. However, the coefficients that we are most interested in change very little across the different specifications of the model.

Table 6 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. 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

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

evaluate the index function, I, using for the explanatory variables the sample means of each variable. The top panel of Table 7 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 7 reports results using this method.

The monopsony model of wage discrimination provides predictions of male/female wage differences. 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 7.

It is informative to compare the wage gaps in Table 7, which are derived from the estimated elasticities of labor supply to the firm, with the wage gaps estimated directly in column II of Table 3, for year-end 1982. (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 6.7 or 6.1 percent, which are remarkably close to the unexplained wage gap of 7.8 percent reported in Table 3. A model of monopsonistic price discrimination explains about 85 percent of the gap that cannot be explained in the wage regression of Table 3!

VII. Discussion

Two issues deserve some discussion here. The first deals with the measurement of monopsony power. In our model, the source of the firm's market power arises from search frictions, so it is interesting to try to quantify the extent to which these frictions bestow labor market power to individual firms.

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

$$(12) \qquad E = \frac{MRP_L - w}{w} = \frac{1}{\varepsilon_{Nw}},$$

where MRP 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 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. The log wage gap is also approximately the difference between the exploitation indexes if the exploitation is small (i. e., the elasticity of labor supply to the firm is large):

$$(13) \qquad \ln(w_f) - \ln(w_m) = \ln(1 + 1/\varepsilon_{Nw}^m) - \ln(1 + 1/\varepsilon_{Nw}^f) \approx 1/\varepsilon_f - 1/\varepsilon_m = E_f - E_m .$$

This approximation is not very accurate for our particular example, however, as our estimated elasticities are not large.

Our results indicate that this firm has substantial market power with estimates of E around 0.3 for men and around 0.37 for women. These estimates suggest that wages of these workers would increase by 30 to 40 percent if market frictions suddenly disappeared! However, this measure of market power is calculated only indirectly by estimating the labor supply elasticity. In this particular workplace the employees are unionized, so it may be that the wage is much not less than the MRP, even though the labor supply elasticity that the firm faces is quite

small.

Is this estimate of the labor supply elasticity too small? Our approach adopts the assumption that workers are identical except for their age and seniority, and that jobs are similar except for the wage paid. Thus, the difference in separation rates across different job titles identifies the separation elasticity (hence, the labor supply elasticity) once we have controlled for the age and seniority of workers. It is possible that other factors vary with workers or with jobs, and these factors might influence separation rates, as well. For example, it is possible that the work done by food and produce clerks is more difficult than that done by variety clerks, or that the higher-paid positions require greater skills. Thus, the quit rate would not appear to decline as much with the wage as it would if it were possible to hold constant these other factors.

Of course, the jobs in these stores clearly *do* vary—courtesy clerks do different work than food clerks, produce clerks do different work than variety clerks. However, all work within the same store, with most working at similar times of day and doing work that appears to require little special training. The same factors might bias the results in the opposite direction, too. For example, the highest paid workers might have first pick of work schedules, so working conditions are actually better in the high-wage jobs. Although we have some concerns, we believe that this is a reasonable approach to estimating the market power of employers.

The other issue relates to 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, and these are fixed by a multi-employer collective bargaining agreement. These differences across job titles allow us to identify the separation elasticity with respect to the wage under the assumptions discussed above. Within the limits of these data, 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.

Unfortunately, the same institutional framework makes it a bit of a stretch to compare our "monopsonistic" wage gaps to those that we have estimated directly in our wage regressions. Since wages are fixed by contract, it is possible to think of the firm as having no wage setting power at all! The regression models of Table 3 stress the importance of worker heterogeneity in the wage determination process and the empirical wage gap arises because women tend to be more highly qualified within job titles. In terms of the monopsony model, our argument must be that the lower labor supply elasticity of women permits the firm to staff lower paying jobs with more qualified women. This benefits the firm by having more productive workers than if these jobs were staffed by men. However, the simple search model on which we base our empirical estimates of the labor supply elasticity to the firm does not address worker heterogeneity. Although our estimates of the wage gap from the wage regressions match closely the wage gaps that are predicted from our estimated labor supply elasticities, the theoretical connection between the two empirical models is not transparent.

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 3.5 for men and about 2.7 for women. This indicates that firms have significant monopsony power—a similar firm in the perfectly competitive market would pay wages that were 30 to 40 percent higher. The difference in the labor supply elasticities of

men and women suggest a role for monopsony power in explaining male/female difference in pay. In fact, the differences in elasticities predict wage differences that are very close to the actual unexplained gender wage gap.

Of course, since the employees that we examine in this paper are all covered by collective bargaining agreements, we must interpret these results with some caution, as the firm is not free to set wages without bargaining. We may think of the firm's wage policy as the following: When bargaining with the union, the firm does its best to create lower paying jobs. Thus, although the type of work is very similar between some who have the "variety clerk" title and others who have the "food clerk" title, the variety clerk is paid much less. Once the wage structure of jobs is set, the firm chooses a level of quality for employees, and then fills the jobs. Our answer to the question of "Why do women have the bad jobs?" is that women are less sensitive to the pay of the jobs, so it makes sense for the company to fill those jobs with women. In the context of the model we have developed here, that means the firm takes advantage of its market power to discriminate against women employees.

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Table 1

Company Characteristics
Retail Operations
Selected Years (As of 31 December)

	1976	1982	1986
Number of Stores	**60**	**58**	**55**
Number of Stores in Largest Metropolitan Area	**35**	**36**	**32**
Number of Retail Employees	**2,182**	**2,480**	**2,489**
Percent of Employees who are Female	**36.20%**	**38.80%**	**41.20%**
Percent of Employees who work Part Time	**50.80%**	**65.40%**	**75.60%**
Average Age	**29.6**	**31**	**31.7**
Average Seniority	**4.5**	**5.9**	**6.3**

Table 2

Characteristics of Job Holders
Year End, 1982

Job Title	Variable	Mean	Standard Deviation	Minimum	Maximum
	Weekly Salary	609.00	0	609.00	609.00
	Annual Earnings	34,099.05	3,859.89	31,543.00	44,204.10
Store Manager	Seniority	15.61	8.23	0.38	34.12
(N=58)	Age	39.44	9.92	25.19	63.14
	Female	0.00	0.00	0.00	0.00
	Weekly Salary	541.00	0.00	541.00	541.00
	Annual Earnings	28,308.88	386.64	27,536.00	29,199.00
Assistant Manager	Seniority	10.85	6.42	0.41	34.21
(N=58)	Age	33.34	8.68	21.97	54.97
	Female	0.05	0.22	0.00	1.00
	Weekly Salary	513.00	0.00	513.00	513.00
	Annual Earnings	26,561.52	146.16	26,147.00	27,047.00
Relief Manager	Seniority	7.04	5.06	0.55	31.13
(N=57)	Age	30.16	9.44	20.30	58.44
	Female	0.05	0.23	0.00	1.00
	Hourly Wage	9.06	0.99	5.58	9.55
	Annual Earnings	17,222.82	3199,21	3,283.58	23,297.20
Food Clerk	Seniority	6.39	5.08	0.03	32.83
(N=1,114)	Age	33.36	11.76	17.72	65.02
	Female	0.54	0.50	0.00	1.00
	Hourly Wage	9.65	0.12	9.50	9.75
	Annual Earnings	20,984.38	1,391.08	17,841.61	24,153.07
Night Crew Chief	Seniority	6.32	3.98	0.50	22.34
(N=56)	Age	29.68	8.97	20.54	56.83
	Female	0.05	0.23	0.00	1.00
	Hourly Wage	3.19	0.29	2.85	3.60
	Annual Earnings	4,859.61	1,408.86	1,760.35	9,761.70
Courtesy Clerk	Seniority	0.90	0.83	0.02	4.40
(N=568)	Age	19.16	4.62	16.09	72.63
	Female	0.29	0.46	0.00	1.00
	Hourly Wage	9.85	0.10	9.65	10.01
	Annual Earnings	23,454.38	1,108.86	18,900.44	25,165.37
Produce Manager	Seniority	14.64	8.61	2.17	31.90
(N=58)	Age	36.29	9.86	20.04	56.61
	Female	0.00	0.00	0.00	0.00

Table 2 (con't)

Job Title	Variable	Mean	Standard Deviation	Minimum	Maximum
	Hourly Wage	8.95	1.13	5.58	9.55
	Annual Earnings	17,899.87	3,478.52	7,811.48	22,281.83
Produce Clerk	Seniority	6.61	6.62	0.22	32.78
(N=109)	Age	30.21	10.39	16.73	61.89
	Female	0.12	0.33	0.00	0.00
	Hourly Wage	11.64	0.09	11.29	11.67
	Annual Earnings	29,147.17	1,572.17	25,116.82	32,309.71
Meat Manager	Seniority	11.43	7.43	1.42	29.08
(N=57)	Age	40.65	9.05	27.21	64.48
	Female	0.00	0.00	0.00	0.00
	Hourly Wage	11.28	0.33	7.20	11.33
	Annual Earnings	24,523.44	2,652.64	3,212.41	28,909.21
Meat Cutter	Seniority	7.19	5.87	0.41	28.64
(N=168)	Age	41.36	11.01	23.11	65.98
	Female	0.01	0.08	0.00	1.00
	Hourly Wage	10.28	0.27	9.07	10.40
	Annual Earnings	18,758.66	4,164.13	2,156.20	24,197.57
Meat Wrapper	Seniority	8.33	6.88	0.23	26.00
(N=89)	Age	41.90	11.42	20.47	64.84
	Female	0.97	0.18	0.00	1.00
	Hourly Wage	7.26	0.96	5.39	8.64
	Annual Earnings	13,132.72	2,410.48	7,736.17	17,021.99
Variety Clerk	Seniority	6.42	4.67	0.16	16.31
(N=78)	Age	32.69	12.63	16.71	63.34
	Female	0.95	0.22	0.00	1.00
	Hourly Wage	6.55	0.95	5.58	8.47
	Annual Earnings	11,659.68	3,074.14	7,674.86	18,272.61
Other	Seniority	5.86	5.59	0.24	18.96
(N=13)	Age	36.28	15.57	18.05	62.08
	Female	0.77	0.44	0.00	1.00

Table 3

Regression Results for Hourly Workers, 1982
Dependent Variable is Logarithm of Hourly Wage
(Standard Errors are in Parentheses)

	I	II	III	IV
Intercept	1.926	-0.221	0.870	1.152
	(0.013)	(0.047)	(0.018)	(0.005)
Female	0.084	-0.078	-0.013	0.011
	(0.020)	(0.012)	(0.005)	(0.005)
Seniority	-	0.065	0.019	-
		(0.003)	(0.001)	
$(\text{Seniority})^2$	-	-2.25e-03	-6.23e-04	-
		(1.26e-04)	(4.60e-05)	
Age	-	0.111	0.019	-
		(0.003)	(0.001)	
$(\text{Age})^2$	-	-1.30e-03	-2.19e-04	-
		(3.04e-05)	(1.61e-05)	
Food Clerk	-	-	0.903	1.039
			(0.007)	(0.006)
Night Crew Chief	-	-	0.966	1.115
			(0.015)	(0.015)
Produce	-	-	0.946	1.135
			(0.015)	(0.015)
Produce Clerk	-	-	0.900	1.029
			(0.011)	(0.011)
Meat Manager	-	-	1.100	1.303
			(0.015)	(0.015)
Meat Cutter	-	-	1.100	1.303
			(0.015)	(0.015)
Meat Wrapper	-	-	1.014	1.167
			(0.013)	(0.013)
Variety Clerk	-	-	0.689	0.811
			(0.013)	(0.014)
Other	-	-	0.596	0.710
			(0.027)	(0.031)
Courtesy Clerk	-	-	-	-
R^2	0.007	0.676	0.961	0.949

Table 4

Distribution of Men and Women Across Jobs
Year-end 1982

	Women Holding Title	Fraction of All Women	Men Holding Title	Fraction of All Men
Store Manager	0	0.000	58	0.038
Assistant Manager	3	0.003	55	0.036
Relief Manager	3	0.003	55	0.036
Food Clerk	599	0.623	507	0.334
Night Crew Chief	3	0.003	53	0.035
Courtesy Clerk	170	0.177	403	0.265
Produce Manager	0	0.000	58	0.038
Produce Clerk	13	0.014	96	0.063
Meat Manager	0	0.000	57	0.038
Meat Cutter	1	0.001	167	0.110
Meat Wrapper	86	0.089	3	0.002
Variety Clerk	74	0.077	4	0.003
Other	10	0.010	3	0.002
Total	962	1.000	1518	1.000

Table 5
Summary Statistics for Grocery Store Data

A. Full Sample (1977-1985)
Sample size = 14,570

Variable	Mean	Standard Deviation	Minimum	Maximum
Separated	0.16	0.37	0.00	1.00
Age	33.74	12.64	16.25	75.63
Tenure	6.99	5.86	0.03	37.22
Female	0.44	0.50	0.00	1.00
Wage (nominal)	8.12	2.42	1.96	13.28
Wage (1977 Dollars)	5.63	1.29	1.60	7.48
Fraction of sample from each year				
Year 1977	0.098			
Year 1978	0.098			
Year 1979	0.106			
Year 1980	0.118			
Year 1981	0.125			
Year 1982	0.125			
Year 1983	0.113			
Year 1984	0.110			
Year 1985	0.108			

B. Early Years (1977-1982)
Sample Size 9,751

Separated	0.16	0.37	0.00	1.00
Age	33.16	12.81	16.46	72.63
Tenure	6.36	5.63	0.03	35.53
Female	0.43	0.50	0.00	1.00
Wage (nominal)	7.27	2.02	1.96	11.67
Wage (1977 Dollars)	5.57	1.27	1.79	7.33
Fraction of Sample from Each Year				
Year 1977	0.146			
Year 1978	0.146			
Year 1979	0.158			
Year 1980	0.177			
Year 1981	0.186			
Year 1982	0.186			

Table 6
Probit Regression Estimates of Separations

	All Years (Sample Size = 14,570)			Early Years Only (1977-82) (Sample Size = 9,751)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Intercept	-0.2887	-0.5695	-0.2643	-0.8614*	-1.0904*	-1.0808*
	(0.3466)	(0.3500)	(0.3597)	(0.4360)	(0.4389)	(0.4472)
Log(W) (real wage)	-1.1273**	-1.0165**	-0.9909**	-1.2217**	-1.1107**	-1.115**
	(0.0576)	(0.0590)	(0.0601)	(0.0729)	(0.0749)	(0.0761)
Female * Log(W)	0.1507	0.1561	0.1590*	0.2777**	0.2801**	0.2702*
	(0.0808)	(.0808)	(0.0810)	(0.1055)	(0.1055)	(0.1058)
Female	-0.2044	-0.2404	-0.2436	-0.4085*	-0.4377*	-0.4191*
	(0.1337)	(0.1336)	(0.1340)	(0.1735)	(0.1735)	(0.1739)
Age	0.1472**	0.1675**	0.1566**	0.2055**	0.2221**	0.2271**
	(0.0327)	(0.0330)	(0.0335)	(0.0420)	(0.0422)	(0.0427)
Age^2	-0.0052**	-0.0056**	-0.0053**	-0.0067**	-0.007**	(0.0071)**
	(0.0008)	(0.0009)	(0.0009)	(0.0011)	(0.0011)	(0.0011)
$Age^3/1000$	0.0525**	0.0544**	0.0525**	0.0637**	0.0651**	0.0662**
	(0.0069)	(0.0070)	(0.0071)	(0.0091)	(0.0091)	(0.0092)
Tenure		-0.062**	-0.0669**		-0.0645**	-0.0661**
		(0.0078)	(0.0080)		(0.0098)	(0.0098)
$Tenure^2$		0.0018**	0.0019**		0.0022**	0.0022**
		(0.0003)	(0.0003)		(0.0004)	(0.0004)
Year Indicators	No	No	Yes	No	No	Yes
Log Likelihood	-5,67719	-5,642.33	-5,629.6	-3,852.97	-3,831.15	-3,821.61

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 7
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	3.162	3.597
Women	2.654	2.726
Implied female/male wage ratio	0.956	0.935
$\ln(w_f)-\ln(w_m)$	-0.045	-0.067
B. Sample Mean of Individualistic Estimates		
Men	3.172	3.592
Women	2.965	2.785
Implied male/female wage ratio	0.983	0.941
$\ln(w_f)-\ln(w_m)$	-0.017	-0.061

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, the averages over individuals.

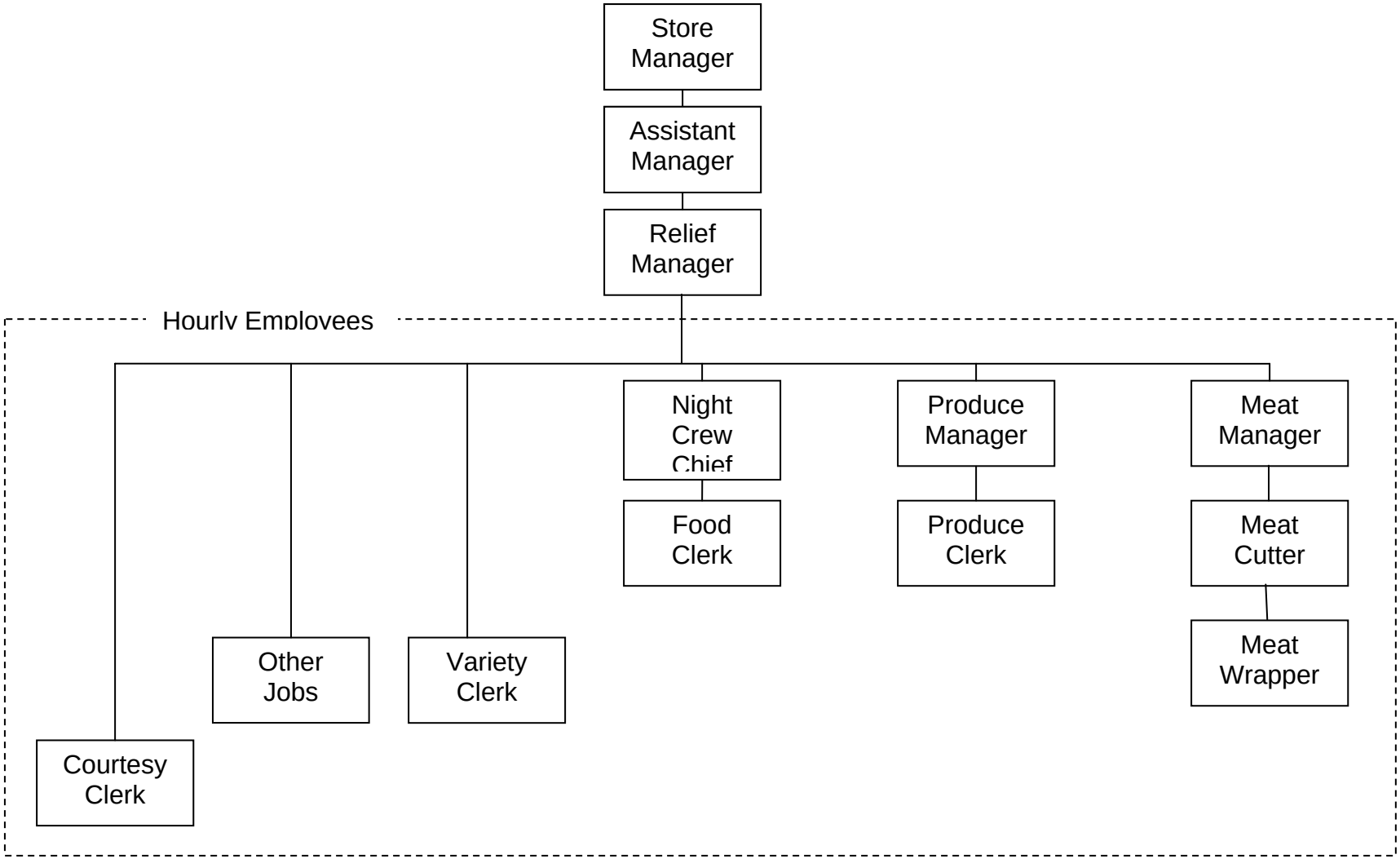

Figure 1
Organization of Store Level Employees