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New Market Power Models and Sex Differences in Pay

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Abstract.

In the context of certain general equilibrium search models, it is possible to infer the elasticity of labor supply to the firm from the elasticity of the quit rate with respect to the wage. We use this framework to estimate the elasticity of labor supply for men and women workers at a chain of grocery stores operating in the southwestern United States, identifying separation elasticities from differences in wages and separation rates across different job titles within the firm. We estimate elasticities of labor supply to the firm of about 2.7 for men and about 1.5 for women, suggesting significant wage-setting power for the firm. Since women have lower elasticities of labor supply to the firm, a Robinson-style monopsony model might explain lower relative pay of women in the grocery industry. The wage gaps we observe among workers in US retail grocery stores are close to what the monopsony model predicts for the elasticities we have estimated.

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 equally productive 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. Following Becker (1971), much of this literature has focused primarily on explaining how discriminatory wage differences could occur in competitive markets.

However, some recent models suggest that employers may have market power, even when there are numerous employers in the market. 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.
>
> "... 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 …"

One interpretation of the ideas expressed in these paragraphs has been formalized cleverly in general equilibrium search models of the kind proposed by Burdett and Mortensen

(1998). In these types of models, 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 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, the models formalize the idea that labor market frictions can have an important impact on the operation of the market.

An implication of these 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 against women workers. While the observed gender wage gap among workers in the retail grocery industry in the US is roughly consistent with the elasticities that we estimate, we suggest that the observed gap should be smaller if labor market monopsony is the only source of wage differences, since there are many institutions in place that limit how such potential market power might be exercised.

II. Dynamic Monopsony[1]

Consider a simple dynamic model of monopsony. The firm's employment in the current period depends on employment during the preceding period and the wage offered in the following way:

$$N_t = [1 - s(w_t)]N_{t-1} + R(w_t),$$

[1] In the following discussion, we closely follow parts of the presentation by Manning (2003, Chapter 2).

where s(w) is the separation rate and R(w) is the recruitment rate. In a long run equilibrium, the size of the firm is constant so total separation must equal total recruits. Thus,

$$s(w)N(w) = R(w), \text{ or}$$

$$(1) \qquad N(w) = R(w)/s(w)$$

In elasticity form, this relationship can be written as:

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

It is our intention to estimate a model of labor supply to the firm using this dynamic relationship. However, the employer that we study is clearly not a monopsonist, but interacts with many employers in a large labor market. At least two recent theoretical approaches to modeling the labor market describe ways by which "small" employers may wield monopsony power. Bhaskar and To (1999) develop a model of monopsonistic competition. In their model, heterogeneous workers have preferences across non-wage characteristics of jobs, giving each employer some market power. Another approach is the general equilibrium search model of Burdett and Mortensen (1998), where market power accrues to employers because of search frictions.

In the Burdett-Mortensen model, currently employed workers constantly search for jobs.[2] As job offers arrive, an employee leaves his current employer if offered a higher wage. If an employer were to increase the offered wage, the rate at which employees leave would fall and recruiting success would increase, leading to a larger work force. In equilibrium, the flow of recruits to the firm just balances the flow of those who leave, and this defines the labor supply to the firm in exactly the way described by equations (1) and (2) above.

The Burdett-Mortensen model provides two important results for our purposes. First, it

[2] Unemployed workers also search for jobs, but in the simplest versions of their model an unemployed worker accepts any job that is offered, regardless of the wage.

gives a consistent theoretical framework that supports the idea that a firm may have power to set wages in the labor market, even in markets with many employers. The second result greatly simplifies our approach to estimating the labor supply to the firm. In their model, firms recruit employees from other employers whose wages are lower. So the recruit of one employer is the separation of another. Thus, the recruitment elasticity is simply the negative of the separation elasticity. [See Manning (2003, p. 97) for a formal derivation of the result.] Therefore, the elasticity of labor supply to the firm can be written as:

$$\varepsilon_{Nw} = \varepsilon_{Rw} - \varepsilon_{sw} = -2\varepsilon_{sw}. \tag{3}$$

This makes it possible to estimate the firm's labor supply elasticity only from information on the firm's separations, a much clearer problem than estimating the elasticity of recruits with respect to the wage.

Clearly, the Burdett-Mortensen model is very abstract and fails to describe many important facts of the labor market. Still, generalizations such as Mortensen (2003) or Bontemps, Robin and Van den Berg (1999) maintain much of the monopsonistic flavor of the original while providing more useful explanations of labor market phenomena. Nevertheless, some have argued that it is inappropriate to adopt this as a description of the labor market. For example, Kuhn (2004) offers several thoughtful criticisms.

In our work we estimate the elasticity of labor supply to the firm simply by estimating the elasticity of the separation rate with respect to the wage, as in equation (3). The Burdett-Mortensen model provides a formal justification for the approach. However, while the Burdett-Mortensen model is sufficient, it is not strictly necessary. Our empirical approach really only depends on two results: first, that the dynamic labor supply to the firm may be upward sloping; second, that the separation elasticity is the negative of the recruitment elasticity. The first might

be justified by other models, Bhaskar and To (1999) being one example. The second, however, depends on the notion that one firm's separations are the recruits of another firm, which is clearly not strictly true. See Manning (2003, pp. 96-105) for a discussion and extensions that examine the impact of allowing the recruitment of non-employed and separations to non-employment to be sensitive to the wage, as well. Unfortunately, the more sophisticated models he suggests require much more detailed data than are available to us.

Nevertheless, the Burdett-Mortensen-Manning framework does provide the insight that there is a link between the recruitment and the separation elasticities, since a substantial portion of recruits does come from other employment. Furthermore, there is intuitive appeal in the idea that recruiting is approximately as responsive to changes in the wage as is retention. Still, our results should be thought of as an approximation.

III. The Firm

The data we analyze come from a regional grocery retailer in the southwestern 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 retail employees. The number of stores and employees fluctuated somewhat, 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 up to three salaried "management" positions: the store manager, the assistant manager, and the relief manager. Other 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. A few of the stores also had a bakery department, where Bakery Sales Workers were employed. (There were apparently no actual bakers employed at these stores.) Courtesy Clerks bagged and carried groceries for customers. The produce and meat departments had "managers" who received a pay premium but were part of their respective bargaining units. The Night Crew Chief supervised stocking operations during the hours the stores were closed, and also received premium wages.

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 local unions, which was affiliated with the United Food & Commercial Workers Union. This was a multi-employer agreement that included several other large grocery chains 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. Table 2 shows the contracted wage schedules for Food Clerks, Variety Clerks and Courtesy Clerks as of December 28, 1980. Similar schedules applied to other dates during the

period of our analysis. Other jobs, such as Bakery Sales Worker, Produce Manager, and Night Crew Chief are not mentioned in the contract schedule, but wages for those jobs appear to be tied to the wage scale of food clerks.

Table 3 reports the average wage for workers within each job title as of December 31, 1980 (i. e., at the beginning of 1981), along with the separation rate for that job title during the year. The logarithm of the separation rate is plotted against the logarithm of the average wage in Figure 2. The figure clearly demonstrates the strong negative correlation between the average wage of the job title and the separation rate for workers who began the year in that job. Essentially, this correlation is the empirical basis of our analysis that follows.

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 some meat department employees had special skills. However, the other employees were, apparently, mostly trained on the job, although provisions of the contract allowed for workers with previous experience as grocery store clerks to receive seniority credit for that experience. According to a supplementary survey of a small sample of employees, most employees 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.

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 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 and perhaps upon the way that women viewed their workplace and employer.

IV. Data

The data we use come from year-end payroll files of the firm. These data include the wage 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.

V. 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:

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

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, and X represents a vector of other explanatory variables. We treat the wages of workers as fixed, since they are exogenously determined by a set of contractual rules that are beyond the control of the employer and the worker. We estimate this equation separately for men and women employees.

We have estimated two versions of this model for each of the sample periods. Model I includes 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 along with a set of indicator variables for each year. 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.[3] The coefficient that we are most interested in changes very little across the different specifications of the model.

Tables 5a and 5b reports the results of our estimation for the two different time periods

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

that we analyze. 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 most visible difference between the two specifications is that the coefficient on the log of the wage drops for women while it increases slightly for men. This results in much different elasticity estimates for women using the two periods. We do not have a good explanation for this, although the expectations of women at the firm may have changed as a result of the lawsuit.

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

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

where I is the value of the index function that is estimated in the probit regression. In our specification of the separation rate function, the separation rate elasticity is proportional to the hazard rate (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 their overall sample means. 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. Both methods yield almost identical results for estimated elasticities.

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 $N_j W(N_j)$, 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.[4] Our estimates suggest that a wage difference of between 9 and 20 percent would arise if an employer in this market were able to take full monopsonistic advantage of the differences in labor supply elasticities between men and women.

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

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

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

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.

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

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 if the employer sets wages to maximize profits. Our estimates indicate that this firm has substantial potential market power—values of E are around 0.4 for men and almost 0.6 for women.

VI. Can Monopsony Explain the Gender Wage Gap?

We do not interpret our estimates to imply that the wages we observe at this firm would increase by 40 to 60 percent if market frictions suddenly disappeared. This firm is obviously constrained in wage setting—its wage making power is tempered by the bargaining power of its workers and their unions. In fact, in a sense the firm has little ability to change the wages at all; wages for each job title are fixed by contract, something that we explicitly note in our estimation procedure, which treats theses wages as exogenously determined. The firm faces an upward sloping labor supply curve—it has market power due to market frictions—but it is unable to take full advantage of it because of the institutions and environment in which it operates.

Similarly, we cannot look to monopsonistic discrimination as a source of gender differences in pay at this firm, since wages in each job are fixed. If all jobs are filled, then it does not matter to the employer whether a particular job is filled by a woman or a man—the total wage bill will be the same, although perhaps the firm could increase employment in the bakery at the expense of grocery operations to take advantage of lower wages. Thus it is more accurate to talk of the elasticity that we estimate as a "notional" or potential elasticity—the labor supply

elasticity that the firm would face in the absence of labor market institutions like unions.[5]

So the labor supply elasticity we have estimated does not permit us to say much about how wages are determined at this firm. However, we can think of this firm as a typical firm in this labor market. Thus, other firms that operate in the same labor market face the same labor supply curve. So we expect that other grocery stores (and perhaps employers in other industries who tap the same market) have similar levels of market power.

To examine this question, we estimate gender wage differences among a broad sample of workers in grocery stores, using data from the Current Population Survey. We combine samples from the Merged Outgoing Rotation Groups from 1979 through 1982 and select individuals who work in the retail grocery industry and are paid on an hourly basis. Table 7 reports our results. From a national sample of slightly less than 15,000 workers, we estimate a disadvantage in pay for women of about 24 percent. If we restrict our analysis to only those workers who lived in the southwest region (California, Arizona, Nevada and Utah), the estimate is about 20 percent--virtually the same value predicted by our estimates for the "early" sample.

We think of our estimate of the exploitation index as a measure of *potential* market power of firms. This power to set wages is surely tempered by legal and institutional factors. For example, in this industry in this period of time, unionization is fairly common. Also, minimum wage laws probably have some impact on wage setting for this market, as well. Nevertheless, to the extent that the institutional and legal constraints on firms' exercise of potential monopsony power are approximately the same for men and women in this industry, the predicted gender wage gap may be a good approximation of how even partial exercise of monopsony power

[5] In fact, women at this firm do receive lower wages than men with similar age and experience. Ransom and Oaxaca (2005) show that this is due to the assignment of women to lower paying jobs in the firm than similarly qualified men. They estimate that women were underpaid in 1982 by about 8 percent compared to similar men.

contributes to gender wage differentials. The close consistency of the predicted gender wage gap from the monopsony model with independent estimates of the gender wage gap supports the idea monopsonistic discrimination may be one reason for the wage differences between men and women in this industry.

VII. Discussion

While our objective here has been to estimate an elasticity of labor supply to the firm, to do that we have, in fact, estimated the elasticity of the quit rate with respect to the wage. There is a substantial empirical literature on quit rates, with early influential papers by Parsons (1972) and Pencavel (1972), for example. More specifically, other papers have also examined differences in quit rates between men and women, such as Blau and Kahn (1981), Viscusi (1980 or Meitzen (1986). However, much of the literature is not concerned with how the quit rate responds to wages, and in those papers where an elasticity-like coefficient is estimated, it is difficult to compare those rates directly with the ones that we have estimated here. The previous work that is most directly comparable to ours is Hirsch, Schank and Schnabel (2006). In their analysis of German data they, too, find labor supply elasticities to the firm are smaller for women than for men. Barth and Dale-Olsen (1999) also find that the elasticity of turnover with respect to the wage is greater for men than for women in a sample of Norwegian workers.

In the present study, 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.

Our approach is reduced form in nature. Others have applied more structural models. 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. [6] 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.[7] 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 to higher pay jobs, even without any effort by the employer to take advantage of its monopsony position. (Our approach, on the other hand, stresses conscious wage discrimination by the employer.)

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. We argue that this provides an estimate of the labor supply elasticity for this firm. Our estimates imply an elasticity of about about 2.5 for men and about 1.5 to 1.8 for women. This indicates that firms have significant potential monopsony power, although this monopsony power would likely be tempered by labor market

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

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

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.

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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

Wage Schedules per Contract
(As of December 28, 1980)

Seniority Level	Food Clerk	Seniority Level	Variety Clerk	Seniority Level	Courtesy Clerk*
0-1040 hours	$4.98	0-1040 hours	$4.814	0-520 hours	$3.35
1041-2080	5.81	1041-2080	5.395	521-1560	3.45
2081-3120	6.64	Thereafter	6.225	Thereafter	3.60
Thereafter	8.30	Hired before 1/15/78	7.774		

*The wages of Courtesy Clerks were tied to the federal minimum wage, which at the time was $3.35. However, many Courtesy Clerks received a student sub-minimum wage of $2.85.

Table 3
Average wages and separation rates by job title, 1981

	Average Wage	Standard Deviation of Wage	Number in Job Title	Separation Rate
Meat Manager	9.80	0.21	57	0.088
Meat Cutter	9.41	0.43	150	0.087
Meat Wrapper	8.52	0.23	84	0.107
Produce Manager	8.41	0.34	57	0.088
Produce Clerk	7.42	1.11	105	0.124
Night Crew Chief	8.21	0.39	46	0.065
Food Clerk	7.31	1.16	991	0.117
Variety Clerk	6.25	0.82	74	0.176
Bakery Sales Worker	5.51	1.01	16	0.313
Courtesy Clerk	2.92	0.26	224	0.335

Note: Average wage is the average wage as of 12/31/1980 of those holding the relevant job title. The separation rate is the fraction of those holding the relevant job title on 12/31/80 that had left the firm by 12/31/1981.

Table 4
Summary Statistics for Grocery Store Data
A. Full Sample (1977-1985)
Sample size = 14,378

Variable	Mean	Standard Deviation	Minimum	Maximum
Separated	0.16	0.37	0.00	1.00
Age	32.75	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	12.47
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	0.36	0.00	1.00
Age	32.17	12.78	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	0.180
Year 1981	0.189
Year 1982	0.189

Table 5a

Probit Regressions Estimates of Separations

Full Sample—All Years
(Standard Errors in Parentheses)

	Model I		Model II	
	Female	Male	Female	Male
Log wage	-0.7360	-0.9071	-0.5480	-0.7570
	(0.0892)	(0.0686)	(0.0961)	(0.0734)
Age	0.2460	0.0632	0.2120	0.0556
	(0.0549)	(0.0517)	(0.0556)	(0.0546)
$Age^2/10$	-0.0842	-0.0273	-0.0745	-0.0238
	(0.0145)	(0.0140)	(0.0147)	(0.0148)
$Age^3/1000$	0.0833	0.0302	0.0757	0.0270
	(0.0121)	(0.0120)	(0.0123)	(0.0127)
Tenure			-0.0682	-0.059
			(0.0123)	(0.0109)
$Tenure^2$			0.00237	0.0015
			(0.0005)	(0.0004)
Year Dummies?	No	No	Yes	Yes
Constant	-1.948	0.0391	-1.4800	0.2570
	(0.580)	(0.5203)	(0.591)	(0.557)
N	6320	8058	6320	8058

Table 5b
Probit Regression Estimates of Separations
Early Sample—1977 to 1982 only

	Model I		Model II	
	Female	Male	Female	Male
Log wage	-0.616	-0.955	-0.452	-0.845
	(0.120)	(0.0844)	(0.128)	(0.0909)
Age	0.239	0.0944	0.220	0.102
	(0.0672)	(0.0634)	(0.0684)	(0.0660)
$Age^2/10$	-0.0813	-0.0354	-0.0755	-0.0360
	(0.0177)	(0.0173)	(0.0181)	(0.0181)
$Age^3/1000$	0.0799	0.0370	0.0754	0.0369
	(0.0148)	(0.0148)	(0.0151)	(0.0155)
Tenure			-0.0742	-0.0477
			(0.0148)	(0.0142)
$Tenure^2$			0.00293	0.00141
			(0.000596)	(0.000571)
Year 1978			0.0628	-0.108
			(0.0953)	(0.0782)
Year 1979			-0.130	-0.203
			(0.0960)	(0.0792)
Year 1980			-0.0267	-0.0904
			(0.0906)	(0.0744)
Year 1981			-0.104	-0.202
			(0.0904)	(0.0764)
Year 1982			0.0659	0.0247
			(0.0876)	(0.0722)
Constant	-2.072	-0.300	-1.949	-0.371
	(0.703)	(0.633)	(0.711)	(0.658)
Observations	4143	5408	4143	5408

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	2.413	2.669
Women	1.793	1.474
Implied female/male wage ratio	0.908	0.819
$\ln(w_f)-\ln(w_m)$	-0.096	-0.200
B. Sample Mean of Individualistic Estimates		
Men	2.436	2.692
Women	1.804	1.482
Implied female/male wage ratio	0.908	0.819
$\ln(w_f)-\ln(w_m)$	-0.097	-0.200

Notes: 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. These estimates are based on estimates of Model II from Tables 5a and 5b for relevant sample.

Table 7
Estimated Gender Gap for Hourly Grocery Store Employees in the CPS Merged Outgoing Rotation Group Files (1979-1982)

(Dependent Variable is log wage)

COEFFICIENT	All US	Southwest Only
Female	-0.238 (0.00598)	-0.195 (0.0167)
Age	0.123 (0.00468)	0.154 (0.0144)
Age^2	-0.229 (0.0124)	-0.296 (0.0391)
Age^3	0.0125 (0.00101)	0.0169 (0.00329)
Education = 12 Years	0.119 (0.00761)	0.136 (0.0239)
Education = 13-15 years	0.131 (0.00871)	0.0943 (0.0242)
Education = 16 years	0.138 (0.0176)	0.145 (0.0409)
Education > 16 years	0.0760 (0.0382)	0.128 (0.0784)
Year=1980	0.0656 (0.00813)	0.0419 (0.0225)
Year=1981	0.122 (0.00822)	0.103 (0.0229)
Year=1982	0.169 (0.00863)	0.189 (0.0242)
Constant	4.336 (0.0498)	4.076 (0.153)
Observations	14808	1945
R-squared	0.324	0.363

Note: Robust standard errors are in parentheses.

Figure 1
Organization of Store Level Employees

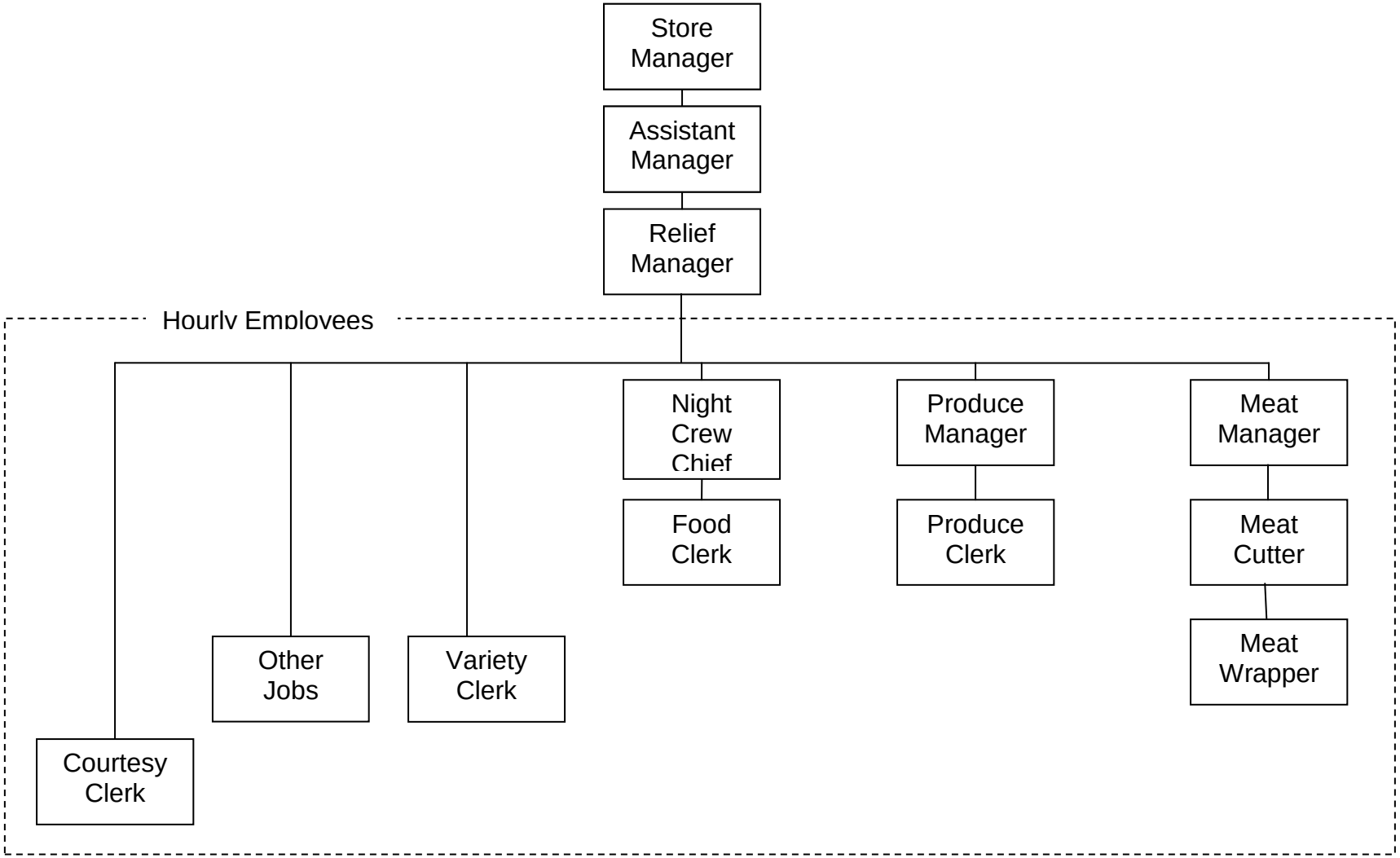
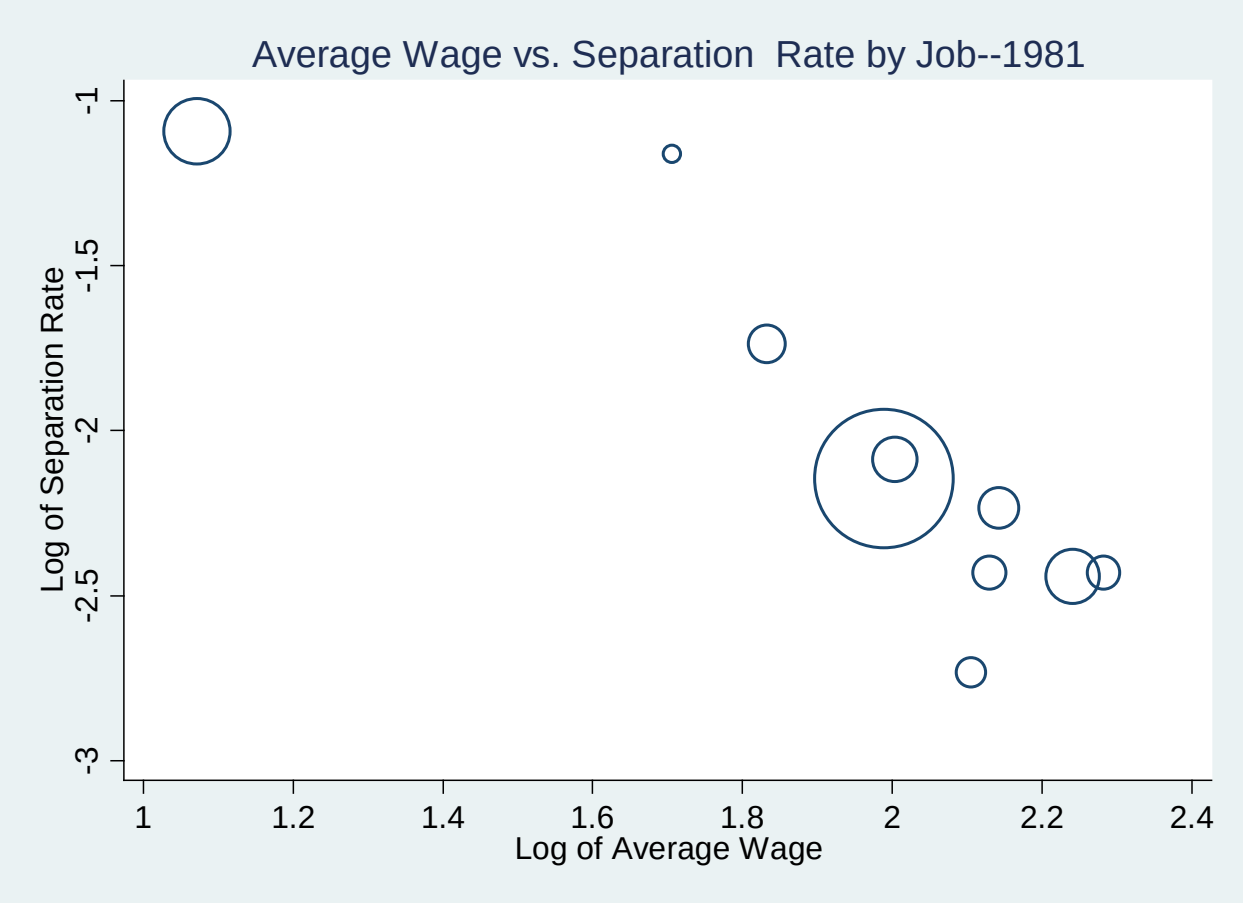


Figure 2
Separation Rates vs. Wages by Job Title for 1981



Notes: Size of circle represent relative number of employees in that job title.