
Gender Segregation in Small Firms

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ABSTRACT

This paper studies interfirm gender segregation in a unique sample of small employers. We find that interfirm segregation is prevalent among small employers, as men and women rarely work in fully integrated firms. We also find that the education and sex of the business owner strongly influence the sex composition of a firm's workforce. Finally, we estimate that interfirm segregation can account for up to 50 percent of the gender gap in annual earnings.

I. Introduction

While explanations of why women earn less than men remain controversial, one popular view is that discrimination segregates women into a few low-paying occupations. This explanation has some appeal since men and women are highly segregated by occupation and because predominantly female occupations are poorly paid (Bergmann 1986; Blau and Ferber 1986; Blau 1989). Yet the focus on *occupational* segregation has been driven as much by data limitations as by any belief that occupation is the only dimension in which men and women are segregated. Indeed, while certain theories of discrimination predict segregation, they are often silent on the dimensions in which segregation will occur (for

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example, Becker 1971; Arrow 1972). It is unfortunate, therefore, that relatively few authors have studied *interfirm* gender segregation (McNulty 1967; Buckley 1971; Blau 1977; Bielby and Baron 1984; Pfeffer and Davis-Blake 1987; Groshen 1991), particularly since these papers find that interfirm segregation is quite prevalent, and that it plays an important role in women's reduced pay. Further, the generality of these few studies is limited because they analyzed large employers in a few industries or locales.¹ This paper addresses this gap by studying interfirm segregation in a national sample of small employers drawn from a broad range of industries.

Two additional facts motivate our focus on small employers. First, there are several reasons to believe that sex discrimination will manifest itself differently in small and large firms. On one hand, the fact that federal antidiscrimination rules primarily target large firms may make them less likely to discriminate. On the other hand, the increased monopoly power and greater separation of ownership and control in large firms may lead such firms to discriminate more frequently. While these views differ, both suggest that interfirm segregation in small firms may vary from that found in large firms.

Second, Becker (1971) theoretically identifies employer discrimination as a cause of gender segregation. However, it has been difficult to firmly establish a role for employer discrimination because other theories (for example, discrimination by employees or customers) carry similar implications for segregation. One distinctive implication of employer discrimination is that women are segregated into those employers with, in the language of Becker, the lowest tastes for discrimination. Since it is difficult to accurately measure such tastes, the only practical approach is to make a priori theoretical links between observable employer characteristics and discriminatory tastes. Yet there have been few attempts to empirically link the demographic characteristics of employers to the sex of their employees. This absence of even indirect evidence of employer discrimination is partially due to difficulties in identifying the hiring officers in the large firms where most people work. In contrast, in small firms it is easier to identify the person responsible for hiring decisions, since it is usually the business owner that makes such decisions. Using a recently developed Census Bureau data set, we relate the characteristics of small business owners to the gender composition of the business' workforce. This lets us assess, relatively directly, the role of the employer in determining a firm's workforce.

Our analysis centers on the 1982 Characteristics of Business Owners survey that records demographic information on the owners and employees of small businesses. While these data have limitations, we use them to establish the following facts. First, we find that small firms are highly segregated by sex. Most men work in firms that employ primarily men, and most women work in firms that employ primarily women. Second, we find that the demographic characteristics

1. Our knowledge is also limited by the fact that, with the exception of Pfeffer and Davis-Blake (1987) and Groshen (1991), these authors studied data from the 1960s and early 1970s. Given the significant changes in female labor market activity over the past two decades, these earlier findings may not reflect current labor market conditions.

of the business owner, particularly sex, strongly influence the gender composition of a firm's workforce. Finally, we find that firms that primarily employ women typically pay much less than firms that primarily employ men, but that this difference is largely accounted for by the larger revenues of the male-employee firms.

These results carry implications for both the causes of women's reduced earnings and the effect of any widespread comparable worth program. In particular, the results show that interfirm segregation accounts for much of the male/female gap in annual earnings, and that this is potentially due to discrimination by male employers. The results suggest that comparable worth policies that eliminate intrafirm pay differences between men and women will leave large interfirm pay differences untouched.

The paper proceeds as follows. Section II provides theoretical background, develops hypotheses, and reviews previous research on interfirm segregation. Section III describes our use of the Characteristics of Business Owners data set. Section IV measures gender segregation in large and small firms and analyzes the role of the business owner in determining the gender composition of a firm's workforce. Section V assesses the role of interfirm gender segregation in creating gender differences in annual earnings. Section VI concludes.

II. Background

A. Employer Discrimination and Segregation

This section briefly outlines the empirical implications of Becker's (1971) theory of employer discrimination. The model is based on the assumption that some employers have a distaste for economic contact with female employees. This distaste for contact is measured by a "taste for discrimination" that is the monetary cost of the psychic disutility incurred by the discriminating employer if a woman is employed.² Finally, Becker's model assumes that while some employers have a strong distaste for female employees, other employers may be indifferent, or even prefer female employees.

Several implications are immediately obtained in Becker's model. First, male and female employees are segregated in that women will work for the least discriminatory employers and men will work for the most discriminatory employers. Second, the equilibrium difference between male and female wages is related to the distribution of tastes for discrimination across employers and to the relative proportions of male and female employees. If there are enough nondiscriminatory employers (in other words, employers with no taste for discrimination), then men and women will be segregated, but there will be no wage gap. However, if there are more female employees than can be hired by the nondiscriminatory employers, then women will be forced to seek employment at the discriminating firms.

2. For example, if an employer has a taste for discrimination against women of \$1 per hour, then this implies that the employer will be indifferent between two otherwise identical employees, one male and one female, if the man's hourly wage is \$1 more than the women's hourly wage.

Since discriminatory firms will only hire women if they cost less than men, this will lead to an equilibrium gender wage gap.³

While emphasizing the role of employer discrimination, Becker also notes the role of discrimination by customers and coworkers. For example, suppose that some customers discriminate in the sense that they are willing to pay a higher price for goods or services produced by men. Further, suppose that firms are heterogeneous in the extent to which their customers discriminate against women.⁴ In such a case, Becker's model suggests that interfirm gender segregation can arise even without employer discrimination. Similarly, suppose that male employees discriminate in the sense that some men are indifferent between a low-paying job with all male coworkers and a higher-paying job with female coworkers. Becker shows that these circumstances can also lead to interfirm gender segregation, even without employer discrimination.⁵

Whereas Becker's and certain other models (for example, Bergmann, 1974) view discrimination as the cause of gender segregation and earnings differences, Mincer and Polachek (1974) and others emphasize the role of human capital. In particular, Mincer and Polachek argue that child care and other responsibilities lead women to invest less heavily in market human capital. If true, then this differential investment could lead to lower earnings for women and to segregation of women into occupations and firms that require less human capital. While sharing many empirical predictions of discrimination theory, this human capital view implies that women are paid less simply because they are less productive.

B. Empirical Studies of Employer Discrimination

A substantial amount of research shows that employers treat male and female job applicants differently. Such research has generally sent otherwise identical male and female applicants (or resumes) to employers advertising job openings. Male applicants for traditionally female positions (for example, secretary) and female applicants for traditionally male positions (for example, mechanic) are often discouraged by employers (Levinson 1975; Powell 1987; Riach and Rich 1987), and when employers move to fill open positions, they are often influenced by the sex of the incumbent (Konrad and Pfeffer 1991). Yet while such activity could reflect employer discrimination, Becker emphasizes that such employer behavior may arise from employee or customer discrimination. For example, even restaurant owners with no taste for discrimination may favor male applicants if their customers prefer waiters to waitresses. As a result, such findings are rather indirect evidence of *employer* discrimination.

3. While this briefly summarizes the static implications of Becker's model, Becker and Arrow (1972) also discuss the dynamic implications of the model. We do not address these dynamic implications because our empirical work is essentially static.

4. It is a bit difficult to imagine why two otherwise identical firms would be heterogeneous on this dimension. However, it is easy to imagine that firms in slightly different lines of business might differ. For example, men's and women's clothing stores might face quite different pressure from their customers with regard to the gender of their employees.

5. While employee discrimination can generate gender segregation, it is unlikely to result in male/female wage differences unless augmented with some other type of discrimination.

A more direct way to assess the role of employer discrimination is to measure the relationship between an employer's discriminatory attitudes and the gender composition of his or her employees. It is of course difficult to measure discriminatory attitudes independently of actions. One approach would be to survey employers, but they are unlikely to express discriminatory attitudes.⁶ An alternative approach is to establish a priori links between discriminatory attitudes and observable demographic characteristics, and to then examine the relationship between these characteristics and segregation. Popular culture suggests that the sex of the employer is the demographic characteristic most likely to be correlated with tastes for sex discrimination. While some sociological and psychological research suggests that men and women are both prejudiced against women (Goldberg 1968; Kanter 1977), the preponderance of evidence (for example, Kanter 1977; Ferber and Huber 1975) suggests that male employers are *more* likely than female employers to discriminate against female employees. Therefore, our working hypothesis is that male employers have a relative preference for hiring male employees. In Becker's model, this hypothesis suggests that male-owned firms employ more male workers and may pay higher wages.

Of course we could consider finer hypotheses. For example, any given employer's preferences might depend crucially on the particular occupation or job title being filled (for example, an employer may want male mechanics but female secretaries). The data we examine are sufficiently coarse, however, that we restrict attention to the broader hypothesis that male employers prefer male employees. In addition, we consider the hypotheses that discriminatory behavior varies with the age or education of the business owner. While not often modeled, these hypotheses arise naturally from popular views about the education process and cohort changes in attitudes about gender roles.

C. Discrimination in Small and Large Firms

There are several reasons why sex discrimination might manifest itself differently in large and small firms. First, federal anti-discrimination policy disproportionately targets large firms. The Civil Rights Act of 1964 bans sex discrimination in employment, but only for those firms with more than fifteen employees, and the federal government explicitly restricts affirmative action to federal contractors with more than fifty employees. Beyond these explicit size distinctions, federal policy creates implicit size distinctions between firms that are all above the explicit limits. This occurs because civil rights and affirmative action litigation often turns on the interpretation of statistical evidence about whether a firm treats women fairly (Smith and Welch 1984). Since strong statistical evidence is harder to come by in small firms, discriminatory behavior is more likely to be detected and punished in large firms. This combination of explicit and implicit pressure

6. We should note, however, that a famous study by LaPiere (1934) suggests that employers may discriminate *less* than they lead on. In that study, LaPiere toured the United States with a Chinese couple and visited 251 hotels and restaurants. While the threesome was denied access to only one establishment, in response to a later questionnaire over 90 percent of the same establishments said that they would not accept Chinese patrons.

leads to a strictly increasing relationship between firm size and federal pressure to employ women. This in turn suggests that sex discrimination may be most pervasive in small employers.⁷

Other perspectives, however, suggest that small firms will be the *least* likely to discriminate. Becker's theory of discrimination argues that discrimination is costly. The logic is that a nondiscriminating firm that hires women will pay lower labor costs than a discriminatory firm that hires men of the same skill level. If this is true, then larger firms may be more likely to engage in discrimination for at least two reasons. First, Alchian and Kessel (1962) predict that firms with monopoly power face a very high effective tax rate on profits (due to implicit or explicit regulation of profits), which encourages the owner and/or managers of such firms to consume nonpecuniary benefits that escape taxation. While these nonpecuniary benefits will often be posh offices and other amenities, they might also take the form of increased indulgence in discrimination. This reasoning leads Alchian and Kessel (1962) and Becker (1962) to argue that monopolists will be more likely to discriminate, a hypothesis that finds support in a recent study by Ashenfelter and Hannan (1986). Since there is some evidence that market power is positively correlated with firm size (Hall and Weiss 1967), this suggests that large firms will be *more likely* to discriminate against women.

A second reason large firms might discriminate more frequently is that large firms are much more likely to have separation of ownership and management. Just as monopolists often receive little return on increased profits, nonowner managers are imperfectly rewarded (or punished) for changes in profits (Jensen and Murphy 1990). As with monopolists, this means that nonowner managers may indulge themselves in discriminatory practices more frequently than owner managers who bear the full pecuniary cost of discrimination. This reasoning led Ashenfelter and Hannan (1986) to conclude that large firms are more likely to discriminate against women.

D. Previous Empirical Work on Interfirm Gender Segregation

While there is a long history to the idea that occupational segregation plays an important role in women's low earnings (for example, Bergmann 1974, 1986; Blau and Ferber 1986), *interfirm* segregation of men and women has received much less attention. This section reviews previous studies of interfirm gender segregation and places our work in their context. In following this discussion, the reader may refer to Table 1 which summarizes selected data sets pertinent to interfirm gender segregation. The table is organized around the data sets rather than the papers themselves because research on this topic has been heavily circumscribed by the available data.

The Equal Pay Act of 1963 outlawed differential pay for men and women in the same occupation and the same firm, and it was initially thought that this might

7. Another distinction is that large firm personnel offices often have no post-hire contact with employees, whereas small firm owners or managers typically work with each employee on a daily basis. If hiring officers are primarily concerned with whether they will personally come into contact with women employees, then this distinction suggests that large firms may be less likely to discriminate.

Table 1
Characteristics of Selected Surveys Used in Research on Interfirm Gender Segregation

Survey Instrument (years administered)	Studies Using This Survey	Sampling Universe of the Survey	Survey Information on Individuals' Earnings	Survey Information on Individuals' Human Capital	General Findings
1. Area Wage Surveys (Annually)	Blau (1977) McNulty (1967) Buckley (1971)	Surveys are generally limited to firms with more than 50 employees, but in some industries firms are only surveyed if they have more than 100 employees. However, the survey design varies slightly from year to year and from SMSA to SMSA.	Weekly and hourly earnings are reported by the firm for each employee.	Detailed occupational classification that varies from industry to industry, sex.	Substantial interfirm segregation that accounts for large fraction of gender wage gap.
2. Industry Wage Surveys (Annually)	Groshen (1991)	Surveys are generally limited to firms with more than 50 employees, but in some instances firms are surveyed if they have fewer than 50 employees. As with the AWS, the survey design varies slightly from year to year and from industry to industry.	Weekly and hourly earnings are reported by the firm for each employee.	Detailed occupational classification that varies from industry to industry, sex.	Substantial interfirm segregation that often accounts for large fraction of gender wage gap.
3. EEO-1 Reports (Annually since 1966)	Smith and Welch (1984) Becker (1980)	All private sector firms with more than 100 employees and all federal contractors with more than 50 employees (and \$50,000 in federal contracts).	None.	Broad occupational classification, sex, race.	No work to date on interfirm gender segregation.
4. Characteristics of Business Owners (1982)	Bates (1988)	Survey is restricted to firms whose ownership is classified as individual proprietorship, partnership, or subchapter S corporation.	Firm's annual payroll, average number of employees in a given week.	Sex, race.	No work to date on interfirm gender segregation.

eliminate the intraoccupational component of the gender earnings gap. However, McNulty (1967) and Buckley (1971) used unpublished BLS data to show that little of the intraoccupational wage gap was due to intrafirm pay differences. Instead, McNulty and Buckley showed that a more important cause of the male/female wage gap was the segregation of women into low-paying firms.⁸ Blau (1977) generalized these results with a study of the 1970 Area Wage Surveys (AWS) of Boston, New York, and Philadelphia. Blau found that, even within narrowly defined occupations, men and women rarely work in the same firms and that this played an important role in the intraoccupational male/female wage gap.⁹

Bielby and Baron (1984) studied gender segregation across firms and "job titles" in a sample of 393 California firms surveyed in the late 1960s and early 1970s.¹⁰ They found almost complete gender segregation by job title and, in the few instances where job titles were integrated, men and women almost never worked in the same firm. In their study of college administrators, Pfeffer and Davis-Blake (1987) find that women *and men* working in predominantly female workplaces earn less than workers of the same sex and occupation employed in largely male workplaces. Finally, Groshen (1991) studied five specific industries and found pervasive interfirm segregation that was an important factor in male/female wage differentials in some, but not all, industries.¹¹ Note also that Table 1 also refers to the Equal Employment Opportunity data set that is a by-product of the reporting requirements of Title VII. These data would be useful, but no one has (to our knowledge) used them to study gender segregation, and the EEOC has stopped releasing the data except in extremely aggregated form.¹²

In summary, previous research provides support for the following conclusions: 1) within a given occupation, men are segregated into higher-paying firms, and 2) within a given firm, men are segregated into higher-paying occupations. However, previous research has been limited by its focus on large firms in specific industries and regions. This study extends some of the earlier results to smaller firms in a wide variety of industries and regions.

8. As an example, Buckley examined the wages of male and female elevator operators. He found that firms with only male operators paid wages that were 54 percent higher than the wages paid by firms with only female operators. In contrast, men received wages that were only 18 percent higher in firms that employed both men and women.

9. As an example, among firms employing order clerks in Boston, Blau found that 42 out of the 67 firms in her sample employed only women, while 13 of the remaining 25 employed only men. While this is an extreme example, Blau found that, within occupations, interfirm segregation was the rule rather than the exception. Blau also found that male accounting clerks in Philadelphia had hourly wages that were 23 percent higher than female accounting clerks in that city. Of this 23 percent gap, 20 percent was accounted for by the fact that men worked in relatively high-paying firms while only 3 percent of the gap was due to different pay within establishments.

10. The term "job title" refers to the actual name of a job within an establishment. One way to think of this classification system is as an extremely fine occupational classification system.

11. As an example, Groshen found that roughly half of the male/female wage gap in the nonelectrical machinery industry was attributable to interfirm segregation and that, for this industry, occupational segregation played a relatively minor role.

12. For many years, the EEOC did release these data. To our knowledge, Becker (1980) is the only study of segregation using these data, but he restricts attention to racial segregation.

III. The Characteristics of Business Owners Survey

The Characteristics of Business Owners is a survey of the people that own businesses in any of three legal ownership categories: individual proprietorships, partnerships, or subchapter S corporations.¹³ Although these ownership forms comprise a large fraction of small businesses, the survey excludes many small firms. For example, the survey omitted a small business if it had annual sales of less than \$500, if it was owned exclusively by a U.S. nonresident, if it had more than nine partners or shareholders, or, most importantly, if it was a Chapter C corporation.¹⁴ Corporations with fewer than 35 owners are free to choose between incorporation under Chapter C or subchapter S, and state tax policies often influence a firm's choice between the two.¹⁵ This causes our sample to be more representative in some states than others.¹⁶

The CBO is also selective because it oversampled minority and women-owned businesses. The Census Bureau created five "panels" of 25,000 business owners, where each panel was drawn solely from one of the following groups: Hispanics, blacks, other minorities, women, and nonminority men. To achieve these equal-sized panels, the CBO oversampled businesses owned by women and, particularly, minorities. There are several methods for generating a representative sample of small businesses from the CBO. One can use the sampling weights assigned by the Census Bureau, or one can focus on the women and nonminority male

13. In particular, firms were surveyed if they filed their tax return with one of the following IRS forms: 1040 (Schedule C), 1065, or 1120S. Corporations filing a regular 1120 tax return were excluded. The first of these IRS classifications corresponds to individual proprietorships, or unincorporated businesses that are owned by an individual. This category includes self-employed workers. The second classification includes unincorporated businesses owned by two or more persons. The final classification corresponds to subchapter S corporations that are legally incorporated businesses with 35 or fewer shareholders who, because of tax advantages, elect to be taxed as individuals rather than corporations. This discussion is drawn from U.S. Bureau of the Census (1987).

14. We tried to assess the extent to which the CBO samples the entire universe of small firm employment. Using CBO sample weights, the CBO samples a population of 6.9 million employees of firms owned by 2.9 million business owners (restricting attention to firms with 100 or fewer employees). Therefore, the CBO samples a population of roughly 9.8 million workers. We then compared this with estimates of small firm employment drawn from two alternative sources: the May, 1983 CPS and the 1982 Enterprise Statistics. Although the comparison is complicated by the fact that more than 15 percent of the respondents "don't know" how many employees work at their firm, the CPS figures match up reasonably well with the CBO. Using a variety of assumptions about the actual firm size of the non-respondents, it appears that the CBO covers 45 to 50 percent of small-firm employment. The CPS figures are somewhat different from the Enterprise Statistics that are drawn from establishment surveys. These data suggest that the CBO sample universe accounts for only 30 percent of small firm employment.

15. Chapter C corporations eventually pay out profits to owners as dividends. This means that C corporation profits are taxed once at the corporate level and a second time upon distribution as income to owners. In contrast, profits from subchapter S corporations are taken directly by owners as personal income and taxed as such.

16. We do not view this as a big problem for the issue at hand. With the exception of Williams and Register (1986), there is little evidence that gender segregation or discrimination is worse in some regions than others. To be safe, however, when appropriate we do control for geographical region in the ensuing analysis so as to minimize the impact of our geographically uneven sample.

samples since these groups account for most small businesses.¹⁷ We follow the latter route because of concerns about the reliability of the sampling weights. However, we have computed most of the results reported here for the entire CBO, both with and without sampling weights, and the results are generally insensitive to the choice of sample.

The unusual timing of the CBO also deserves mention. The survey was administered in 1986 to business owners that filed 1982 IRS tax returns. The survey recorded demographic characteristics of the business owner, the 1982 financial condition of the firm, and the racial and gender composition of the firm's 1982 workforce. The answers to these questions were then matched to IRS information on the firm's 1982 employment and payroll.¹⁸

Our sample selection decisions were quite simple. First, we excluded the few firms with more than 100 employees, which emphasizes our focus on small firms and facilitates comparisons of annual earnings between the CBO and the CPS.¹⁹ Second, we measure segregation and earnings gaps between the employees and not the owners of small businesses, a factor that immediately eliminates those small businesses with no employees. We exclude the owners because the information on their income is not directly comparable to the income data available for employees.

On a final note, we use the CBO as a sample of firms although it is essentially a sample of firm owners. This causes complications when we match firms to owner characteristics. Linking owner characteristics to the firm is trivial for firms owned by one person, but multi-owner firms are slightly tricky because not all owners are alike. Following the work of previous CBO users (Holmes and Schmitz 1992), we use the cross-owner mean for continuous variables (such as education) and the cross-owner mode for discrete variables (such as sex or race). In cases of ties for the discrete variables, we use the mode containing the owner that reports spending the most hours per week at the business.²⁰

17. For the three organizational forms surveyed in the CBO, the Census Bureau estimates that 92 percent of the firms are owned by women or nonminority men (U.S. Bureau of the Census 1987).

18. This retrospective sample design is unfortunate because Akerlof and Yellen (1985) have shown that the passage of time can alter people's answers to certain questions. One effect of the retrospective survey design is that the CBO survey response rate was only 79.2 percent, much lower than that found in most contemporaneous surveys. Further, there is evidence that business owners were more likely to answer the survey in 1986 if their 1982 business was still in operation (Nucci 1989).

19. The May, 1983 CPS asked workers about the number of people that worked for their employer. These answers were bracketed into five groups: 0-25, 25-99, 100-499, 500-999, and 1,000+. The 100 employee limit was the most natural choice for our focus on small firms.

20. For example, if a firm has two male and one female owners, then we describe the firm as being "male-owned." If a firm has one male and one female owner, then we describe the firm as "male-owned" if the man reports working more weekly hours at the firm and as "female-owned" if not. Single-owner firms account for 64 percent of the firms and 45 percent of the employment in our sample. At the suggestion of a referee, we looked into the possibility of a more extensive system of classifying firms as "male-owned" or "female-owned," as it is easy to imagine that there might be a fairly complicated relationship between number of owners, number of female owners, and the degree to which a firm discriminates against women. For example, Kanter (1977) argues that "token" women in a large organization will often discriminate against other women, whereas women that are not in an overwhelming minority will tend to be more supportive of other women. Unfortunately, there are not enough sexually integrated, multiple-owner firms in our sample to support much analysis along these lines.

Table 2 presents summary statistics on the firms and owners in our CBO sample. The "all firms" column reports data for our entire sample while the next two columns report results separately for male- and female-owned businesses.²¹ The rows under 1 (Age of Owner) show that there are no significant differences in the distribution of male and female owners across age groups. Row (2) shows that the average business owner has some college education and that male owners are more educated on average. The rows under 3 (Percent Female Employees) report the frequency with which firms fall into various categories of "percent female employees." An example of how to read these numbers is that the ".221" at the top of the "all firms" column means that 22.1 percent of all the firms in our sample have no female employees. These figures show that almost three out of four firms are either 75–100 percent or 0–9 percent female, so that largely segregated workplaces are the rule rather than the exception. The figures also show that female-owned firms are significantly more likely to employ predominantly female workforces. A chi-square test strongly rejects the hypothesis that male and female-owned firms are identically distributed across these categories.

Rows (4) through (9) of Table 2 report mean characteristics of the firms themselves. The first column shows that the average firm in our sample had about five employees, between one and two owners, roughly \$300,000 in receipts, and paid out roughly \$9500 per employee. Given the nonnegativity of these variables, the large standard deviations show that the sample distributions are highly skewed. The next two columns show that male-owned firms have more employees, more owners, higher receipts, and higher payroll per employee than female-owned firms. On most dimensions, therefore, male-owned firms are larger than female-owned firms.

While the CBO has some unique advantages, it also has some attendant limitations. First, the CBO is not a random sample of small businesses, particularly since it omits small Chapter C corporations. Second, while we know firm-wide average payroll for each business, we know nothing about the interfirm distribution of that payroll between male and female employees. Third, the survey records no information on the human capital or occupational characteristics of a firm's employees. This last limitation of the CBO is potentially the most troublesome, since prior research has documented an important role for occupational segregation in creating the gender earnings gap. Given the CBO's lack of occupational information, one might ask whether it really carries important new information. We believe that it does, partly because occupations are less sharply defined in small firms and that, as a result, there is less occupational segregation in small than in large firms. This view receives support from the work of Baron and Bielby (1986) and from our own analysis of data from the Current Population Survey.²²

21. Although the CBO surveys 25,000 nonminority male owners and 25,000 female owners, we end up with many fewer businesses in our sample. This is primarily because we exclude businesses with no employees, but a secondary factor is that many businesses have more than one owner. The number of women-owned firms is particularly reduced because women owners are more likely to be in the gender minority, more likely to own a business with no employees, and less likely to be the owner spending the most hours per week at the business.

22. We analyzed data from the May Current Population Surveys (CPS) of 1979, 1983, and 1987, because in those months the CPS asked workers about the size of their firm as well as the usual questions on

Table 2
Characteristics of Small Firms and Their Owners By Sex of Owner

Variable	All Firms	Sex of Owner	
		Male	Female
1. Age of owner			
Under 25	0.018	0.016	0.022
25-34	0.156	0.154	0.161
35-44	0.269	0.263	0.284
45-54	0.267	0.276	0.245
55-64	0.209	0.210	0.206
65 or over	0.082	0.082	0.083
2. Education of owner*	13.5	13.7	13.0
	(3.09)	(3.12)	(2.95)
3. Percent female employees*			
0 percent	0.221	0.261	0.125
1-9 percent	0.201	0.210	0.180
10-24 percent	0.049	0.055	0.034
25-49 percent	0.091	0.102	0.064
50-74 percent	0.122	0.123	0.120
75-100 percent	0.316	0.250	0.488
4. Number of employees*	5.53	5.60	4.88
	(9.33)	(9.83)	(7.97)
5. Firm receipts*	349,043	367,766	237,092
	(1,177,800)	(1,248,993)	(799,649)
6. Log(firm receipts)*	11.82	11.96	11.49
	(1.26)	(1.24)	(1.26)
7. Annual payroll/employees*	9,637	10,423	7,751
	(13,072)	(14,969)	(6,178)
8. Log(annual payroll/employees)*	8.88	8.97	8.67
	(0.81)	(0.80)	(0.82)
9. Number of owners of firm*	1.65	1.69	1.53
10. Number of firms in sample	4,835	3,414	1,421

Notes: All data drawn from the 1982 Characteristics of Business Owners survey. The numbers for "owner's age" and "percent female employees" refer to the fraction of firms that fall into any particular category. All of the other figures are variable means except for those in parentheses, which are standard deviations. A * indicates that a *t*-test (or a chi-square test for the categorical variables) rejected the hypothesis of equality of the means for male- and female-owned firms, at the 99 percent level. The hypothesis that male and female owners share the same age distribution could not be rejected at the 90 percent level.

This point aside, the fact is that we know so little about interfirm segregation in small firms and so little about the role of the employer in creating segregation that the CBO is interesting despite its limitations.

IV. Gender Segregation and Employment in Small Firms

A. *Measuring Segregation*

Table 3 presents the distribution of male and female workers across firms of various sizes. The data are drawn from the May 1983 Current Population Survey that asked workers questions about size of firm and establishment. The table makes two points. First, firms with less than 100 employees account for a substantial fraction of all U.S. employment.²³ Second, women are more likely than men to work in small firms. One reading of this fact is that large firms are more likely to discriminate against women, perhaps because of their greater monopoly power or because of the greater separation between the ownership and management of large firms. Alternatively, small firms may simply need the skills and occupations of women.

Table 4 presents evidence on the distribution of male and female employment across firms with various female employment shares.²⁴ An example of how to

occupation. We were interested in testing the hypothesis that there is less occupational differentiation in small firms. We tested this by dividing our data into two samples: those who worked for firms with more than 100 employees and those who worked for firms with less than 100 employees. For the entire sample and separately for two-digit industries, we computed the fraction of employment accounted for by the four largest detailed CPS occupations and the fraction accounted for by the two largest major CPS occupations. We found that for the all industry sample and for the vast majority of the two-digit industries, small firm employment is more concentrated in a few occupations than is large firm employment. This finding lends support to the notion that occupational segregation is *less* of an issue in small firms than in large firms.

23. The figures in Table 3 refer to firm size and not establishment size. For those unfamiliar with this distinction, a firm is a legal corporate entity while an establishment is a physical place of business.

24. Business owners do not directly report the number of male and female employees. Instead, they report the fraction of female employment within six bands: 0 percent, 1–9 percent, 10–24 percent, 25–49 percent, 50–74 percent, 75–100 percent. We combine this answer with information on the number of total employees to arrive at an estimate of each firm's female and male employment. We use a two-step procedure. The first step is to see if there is a unique division of the firm's workforce into male and female workers that yields the reported fraction of female employees (for example, 50–74 percent). If there is such a unique division, then we use this division to impute the firm's male and female employment. For example, if a firm has five employees and between 50 and 74 percent female employees, then we assume that the firm has three female and two male employees. In many cases, however, there is no unique division of employees. For example, if a firm has nine employees and between 50 and 74 percent female employees, then the firm could have either five or six female employees. Since we have no way of assessing which is the correct number in such cases, our second step is to assume that the actual female fraction was the midpoint of the band. For example, if a firm has nine employees and between 50 and 74 percent female employees, we imputed the firm as having 5.58 ($.62 \times 9$) female employees and 3.42 ($.38 \times 9$) male employees. There are two ways to interpret our noninteger imputations. The first interpretation is that this is simply the best we can do given the limited information available. The second interpretation is that worker turnover may generate fluctuations in the percent female over time. If owners answer the question as if it referred to their average female employment

Table 3
Male and Female Employment By Firm Size

Size of Firm (number of employees)	Percentage of Employees in Firms of This Size		
	All	Male	Female
1-24	28.7	27.7	30.0
25-99	14.1	14.1	14.0
100-499	13.9	13.1	14.9
500-999	5.6	5.1	6.2
1,000 +	37.7	39.9	34.9

Notes: Data drawn from the May, 1983 Current Population Survey. An example of how to read this table is that 28.7 percent of all workers say that they work in firms with between 1 and 24 employees. The hypothesis that men and women are evenly distributed across firm sizes was rejected by a chi-square test at the 99 percent level.

Table 4
*Male and Female Employment in Small Firms
By Proportion Female Employees*

Percent women employees in the firm	Percentage of employees that work in firms of this type		
	(1) All Employees	(2) Male Employees	(3) Female Employees
0 percent	11.9	20.7	0.0
1-9 percent	21.2	35.2	2.0
10-24 percent	8.9	12.8	3.6
25-49 percent	14.8	16.2	12.8
50-74 percent	15.5	10.5	22.5
75-100 percent	27.6	4.6	59.1

Notes: All data drawn from the 1982 Characteristics of Business Owners survey. An example of how to interpret these figures is that 2.0 percent of the female employees in our sample work in firms where women comprise between 1 and 9 percent of the firm's workforce.

interpret the table is that the second row of Column (3) shows that 2.0 percent of all female employees work in firms where women account for between 1 and 9 percent of employment. Continuing with the second row as an example, we see that firms where women account for between 1 and 9 percent of the workforce account for 35.2 percent of all male employment and 21.2 percent of total employment. More substantively, Column (3) shows that the median woman employed in small firms works in a firm where 75 to 100 percent of the employees are female. Similarly, Column (2) shows that the median male employed in a small firm works in a firm where fewer than ten percent of the employees are female. Bielby and Baron (1984) have shown that it is quite rare for men and women to share the same job title within a given organization. Our results show that, within small firms, it is quite rare for men and women to work in truly integrated organizations, regardless of occupation.

While it suggests a substantial degree of gender segregation in small firms, Table 4 is difficult to compare with prior results. To facilitate such comparisons, we briefly review the Duncan Index (Duncan and Duncan, 1955) that measures the fraction of women (or men) that would have to change firms to completely integrate the workforce. Analytically, the index is computed as

$$(1) \quad S_D = \frac{1}{2} \sum_f |m_f - w_f|$$

where m_f and w_f are the fractions of the *economy-wide* male and female work force, respectively, that work in firm f . The index measures actual segregation relative to a theoretical maximum, so that 0 represents no segregation and 1 represents complete segregation.

Table 5 presents Duncan indices for our entire CBO sample and, separately, for selected two-digit industries. Column (1) reports the number of firms represented in our sample. Column (2) reports the small firm Duncan index for the entire sample, and broken out by the sex of the business owner. The *ALL INDUSTRIES* row of that column shows that 66 percent of men (or women) would have to move to eliminate interfirm segregation. In comparison, Blau (1989) estimates that the Duncan index for detailed occupations was .59 in 1983. Therefore, while occupational segregation has received much more attention in the literature, interfirm segregation among small firms is similarly prevalent.²⁵ The *ALL INDUSTRIES* row also shows, perhaps surprisingly, that there is little difference in segregation between male- and female-owned firms.

In examining small firms, it is important to note that models of random hiring

over time, then our imputations may accurately reflect the average male and female employment within a firm. We have also conducted all of the following analyses using only step two above (in other words, always impute the midpoint of the band). The choice of method causes only trivial differences in any of the following results.

25. One needs to be careful in comparisons of segregation indices across different classification systems. Blau's occupation index was based on classification system of 311 occupations. In contrast, our study is based on over 5,000 firms. It is possible that our high measure of interfirm segregation is merely a product of our finer classification system.

Table 5
Segregation Indices for Small and Large Firms By Selected Industries and Sex of Owner

	(1) Number of firms in CBO	(2) Small Firm Duncan Index		
		All Firms	Male- owned	Female- owned
ALL INDUSTRIES*	4,835	0.66	0.65	0.69
<i>Selected Industries (SIC Code)</i>				
General building contractors (15)	108	0.64	0.62	0.72
Special trade contractors (17)	230	0.68	0.68	0.62
Food products manufacturing (20)*	61	0.67	0.66	0.66
Apparel manufacturing (23)	26	0.34	0.36	—
Printing and publishing (27)	59	0.40	0.34	0.73
Rubber and plastics (30)	19	0.55	0.60	0.42
Nonelectrical machinery (35)	69	0.63	0.61	0.72
Trucking and warehousing (42)	69	0.63	0.62	0.67
General merchandise stores (53)*	62	0.62	0.61	0.75
Food stores (54)*	177	0.51	0.50	0.53
Apparel/accessory stores (56)*	134	0.64	0.62	0.63
Banking (60)	14	0.68	0.61	1.00
Insurance agents (63)	8	0.23	0.04	0.76
Real estate (65)	114	0.49	0.48	0.39
Personal services (72)*	290	0.66	0.68	0.65
Business services (73)*	157	0.62	0.55	0.71
Auto repair and services (75)	149	0.62	0.68	0.38
Health services (80)*	317	0.55	0.58	0.36
Cross-industry mean	—	0.55	0.54	0.51
Cross-industry standard deviation	—	0.16	0.17	0.26

Notes: All data are drawn from the 1982 Characteristics of Business Owners survey. Cross-industry means and standard deviations are based on unweighted averages of 67 two-digit SIC codes. A * indicates that a chi-square test rejects the hypothesis of random hiring at the 95 percent level.

(and models of discriminatory hiring) imply a non-zero Duncan index. As an example, in the extreme case where all firms have one employee the Duncan index will be unity no matter how workers are distributed across firms. It is thus important to gain some idea of how far the observed distribution of male and female employees strays from the distribution implied by a random hiring model.²⁶

26. By "random hiring," we simply mean that firms take independent draws from the pool of available workers, where the probability of picking a female worker on any given draw is equal to the proportion

We do this by employing the chi-square test proposed by Blau (1977).²⁷ In Table 5, an asterisk to the right of each industry's SIC code indicates that a random hiring model was rejected at the 95 percent level. The *ALL INDUSTRIES* row clearly rejects the hypothesis of random hiring. Much of the interfirm segregation measured in the *ALL INDUSTRIES* row may come from the fact that men and women work in different industries. Therefore, the bottom rows of Table 5 report segregation indices for selected two-digit industries. The fact that the industry-specific segregation indices are generally lower than the aggregate indices shows that aggregate segregation is partially due to the interindustry distribution of men and women. Yet the cross-industry mean index is .55, so there is still substantial segregation within these two-digit industries.²⁸ Among food stores, for example, 51 percent of men or women would have to change firms to integrate the work force. Yet, we should also note that a random hiring model cannot be rejected in many industries, including some where we have many firms and a reasonable chance of detecting nonrandom hiring (for example, special trade contractors).²⁹

B. The Determinants of Female Employment in Small Firms

We now ask why there is so much interfirm variation in the fraction of female employment. Table 6 presents CBO estimates of the fraction of women employed by firms with owners of varying demographic characteristics. The first two columns report figures for male-owned firms while the last two report figures for female-owned firms. An example of how to read this table is that the fourth column of the first row shows that 52.0 percent of the employees of female-owned firms are women. The *TOTAL* row shows, not surprisingly, that female owners employ more women than male owners. This may occur because female owners own businesses in industries with more female workers, because female owners have a relative preference for female employees, or, most likely, some combination of both.

The next few rows investigate the role of the business owner's educational attainment and age in determining the sex of employees. Education plays little role among female-owned firms, but male college graduates are much more likely to employ women than are men with less education. Conversely, there is some evidence that younger female owners employ more women, but there is no age

of female workers in the available pool. The available pool may be defined as all the workers in the economy (as in the All Industries row), or as all the workers in a particular industry (as in all other rows).

27. The test proceeds as follows. First, compute the actual distribution of firms across size of firm (one employee, two employees, etc.). A model of random hiring implies an approximate binomial distribution of the number of female employees within firms of any given size. This in turn implies a distribution of firms across our ranges for fraction of female employees (0 percent, 1–9 percent, etc.). The second step is to sum across firm sizes to generate the distribution of firms across fraction female that is predicted by random hiring. The final step is to compare (with a chi-square test) the predicted with the actual distribution of firms. See Blau (1977) for a more complete discussion.

28. This estimate is based on an unweighted average of 67 separate industries.

29. There is no systematic difference between our small-firm results and those of Groshen's (1991) large firm study. In several cases, segregation was more severe in small firms, but there were also cases where segregation was more severe in large firms.

Table 6
Small Firm Employment of Women By Characteristics of Owner and Firm

	Male-Owned Firms		Female-Owned Firms	
	Number of firms	Percentage of employees that are <i>female</i>	Number of firms	Percentage of employees that are <i>female</i>
TOTAL	3,414	38.7	1,421	52.0
Education of Owner (years)				
0-8	200	31.8	70	51.4
9-11	256	25.5	139	44.8
12	1,116	32.9	584	52.2
13-15	596	34.9	276	58.0
16+	1,238	49.7	349	58.8
Age of Owner (years)				
Under 25	54	33.1	30	62.9
25-34	519	44.5	224	56.2
35-44	886	38.8	396	57.5
45-54	930	36.6	342	50.8
55-64	707	38.3	287	49.4
Over 65	275	40.9	116	38.9
Size of Firm				
1-4 employees	2,292	35.8	1,029	58.7
5-9 employees	646	36.7	234	59.6
10-19 employees	294	37.7	99	42.1
20-49 employees	137	41.9	49	44.2
50-99 employees	44	44.1	10	49.9

Notes: All data drawn from 1982 Characteristics of Business Owners Survey. As an example of how to read this table, the second column of the first row indicates that 38.7 percent of the employees of male-owned firms are women.

effect among male owners. The final rows examine the role of firm size. While there is little evidence of firm-size effects among female-owned businesses, larger male-owned firms employ proportionately more women than their smaller counterparts. In summary, Table 6 suggests that owner characteristics and firm size effect the sex composition of a firm's workforce. However, these simple tabulations may be misleading because other factors surely influence firm behavior. In particular, men and women work in somewhat different industries and occupations so that Table 6 could only reflect that businesses owned by women, the young, and the highly educated are located in sectors of the economy that generally employ women. To address these concerns, we turn to regression methods to more systematically analyze the determinants of a firm's gender composition.

As mentioned in an earlier footnote, business owners report the fraction of female employees within six brackets (0 percent, 1–9 percent, 10–24 percent, 25–49 percent, 50–74 percent, and 75–100 percent). In this context, the ordered probit is a natural model to apply. The ordered probit is similar to the binary probit in that it starts with a latent regression

$$(2) \quad y^* = \beta'X + u,$$

where $u \sim N(0,1)$. While y^* is not observed, we do observe y where

$$\begin{aligned} y &= 0 \text{ if } y^* \leq \mu_1, \\ &= 1 \text{ if } \mu_1 \leq y^* \leq \mu_2 \\ &= 2 \text{ if } \mu_2 \leq y^* \leq \mu_3 \\ &= 3 \text{ if } \mu_3 \leq y^* \leq \mu_4 \\ &= 4 \text{ if } \mu_4 \leq y^* \leq \mu_5 \\ &= 5 \text{ if } \mu_5 \leq Y^*, \end{aligned}$$

where $y = 0$ corresponds to 0 percent female employees, $y = 1$ corresponds to 1–9 percent female employees, etc. The μ 's are called *cut points* and are the thresholds for moving from one category to the next, and each observation's imputed value of $X'\beta$ is called the *score* for that observation. The model estimates the β 's and μ 's and uses these to predict the probability that a firm with characteristics X will fall into any of the six ordered categories.

Table 7 reports estimates of various specifications of the ordered probit model. We report estimates for the entire sample (Columns 1–2) and separately for male and female-owned businesses (Columns 3–4 and 5–6, respectively). As with other nonlinear models, it is difficult to interpret ordered probit parameters since the marginal effect of any particular independent variable on the object of interest (here the probability of falling in a particular cell) will depend on the value of all other independent variables. Therefore, we report for each model the mean score along with estimates of the cut points. This information lets one assess the effect of a change in an independent variable evaluated at the mean of the probability distribution. For example, the mean score in Column (5) is 1.125 which, given the estimated cut points, corresponds to the prediction that the mean woman business owner is most likely to have between 50 and 74 percent female employees. Using Column (5) again, adding three years of schooling to a female owner with the mean score results in a score of 1.200. This increases the probability of employing mostly women, but leaves her most likely to fall in the 50–74 percent category.

The first two columns of Table 7 report all-firm estimates of models with and without one-digit industry dummies. Besides the variables listed, each regression also includes controls for the owner's age and marital status, the firm's age, and region.³⁰ The first row shows that male business owners typically employ far

30. The coefficients on owner's age, owner's marital status, and region were unremarkable, but the firm age parameters indicate that older firms employ fewer women than younger firms, holding other things constant. This result is consistent with Arrow's (1972) views on the likely persistence of discriminatory patterns within a particular firm. Results of the full regression are available from the authors upon request.

Table 7
Ordered Probit Models of Female Employment in Small Firms

Independent Variable	All Firms			Male-owned firms		Female-owned firms	
	(1)	(2)	(3)	(4)	(5)	(6)	
Sex of owner (male = 1)	-1.133 (.180)	-1.141 (0.180)	—	—	—	—	
Education of owner (years)	0.033 (0.011)	0.027 (0.011)	0.087 (0.007)	0.081 (0.008)	0.025 (0.012)	0.020 (0.012)	
X male dummy	0.050 (0.013)	0.049 (0.013)	—	—	—	—	
Log of firm employment	0.142 (0.032)	0.144 (0.032)	0.184 (0.020)	0.186 (0.020)	0.153 (0.033)	0.152 (0.034)	
X male dummy	0.044 (0.037)	0.043 (0.037)	—	—	—	—	
Percent women employees in firm's two-digit industry	3.099 (0.089)	3.022 (0.110)	3.172 (0.103)	3.019 (0.130)	2.985 (0.178)	3.040 (0.222)	
Log of average employee earnings for this firm	-0.087 (0.021)	-0.091 (0.021)	-0.081 (0.025)	-0.086 (0.026)	-0.101 (0.041)	-0.105 (0.041)	
Controls for 1-digit industry	no	yes	no	yes	no	yes	
Mean score (mean of X' β)	0.934	0.706	1.865	1.558	1.125	0.993	
(Standard Deviation of score)	(0.891)	(0.898)	(0.874)	(0.873)	(0.767)	(0.792)	
Cut Points							
0% women \rightarrow 1-9% women	-0.118	-0.349	0.901	0.595	-0.100	-0.246	
1-9% women \rightarrow 10-24% women	0.644	0.417	1.653	1.353	0.693	0.553	
10-24% women \rightarrow 25-49% women	0.814	0.587	1.847	1.548	0.807	0.667	
25-49% women \rightarrow 50-74% women	1.137	0.910	2.218	1.920	1.027	0.888	
50-74% women \rightarrow 75-100% women	1.593	1.367	2.715	2.418	1.416	1.279	
Number of observations	4,561	4,561	3,230	3,230	1,331	1,331	
χ^2 (degrees of freedom)	2,315 (26)	2,334 (37)	1,698 (23)	1,722 (34)	429 (23)	441 (34)	
p-value for χ^2	0.000	0.000	0.000	0.000	0.000	0.000	

Notes: Standard errors are in parentheses. All data drawn from 1982 Characteristics of Business Owners Survey. In Columns (2), (4), and (6), professional services is the omitted industry. All regressions also included controls for owner age, owner marital status, firm age, and region.

fewer women than do similar female business owners. While this is perhaps unsurprising, we are unaware of any similar results in the literature. If we accept the premise that male employers have a relative preference for male employees, then this result suggests that employer tastes for discrimination play an important role in creating interfirm segregation. Alternatively, it could be that male employers operate firms that need traditionally male skills and occupations. The second row shows that educated business owners employ more women, but the effect is attenuated with one-digit industry dummies which suggests that education picks up omitted industry effects. The next row shows that education effects are much stronger for male than for female business owners. This may occur because less educated men are more likely to discriminate or, alternatively, because education is still picking up omitted industry effects.

The next few rows of Columns (1) and (2) show that larger firms employ more women and that the relationship between size and female employment is slightly stronger among male-owned businesses. One interpretation of these facts is that federal antidiscrimination policy has shifted women's employment toward larger firms. This interpretation has some appeal since the firm size effects are strongest for the male employers who might be most expected to discriminate. Alternatively, larger firms may need female-dominated occupations, or they may more easily offer benefits that are particularly important to women.

The coefficient on "percent women employees in firm's two-digit industry" is more of an identity than a behavioral relationship. All it says is that firms in predominantly female industries employ more women. Note, however, that the inclusion of this variable is a partial substitute for a more complete set of industry dummies (which we did not use for computational reasons). Finally, the next row reports the relationship between a firm's average per-employee payroll and the fraction of women it employs. While low-paying firms employ more women, we defer discussion of this issue until the next section. The rest of the table reports analogous models broken out by the sex of the owner, with results highly similar to those of the first two columns.

C. Discussion

This section has found significant gender segregation across small firms in the CBO, and that the sex of the owner affects the sex composition of a firm's workforce. These results are consistent with the hypothesis that employer discrimination, primarily by male employers, forces men and women into different firms. This reading suggests that discrimination has an interfirm component to it, beyond the interoccupational component documented by so many previous authors. Yet, there are alternate readings of these data. For example, it could be that discrimination operates primarily along occupational dimensions, that firms vary in their occupational requirements, and therefore that interfirm segregation is merely a proxy for interoccupational segregation. An alternate nondiscriminatory interpretation is that men and women simply bring different skills to the market and that some firms need "male" skills and other firms need "female" skills. In this view, interfirm segregation is not the product of discriminatory attitudes, but

of simple sorting of workers to the firms where their skills are most in demand.³¹ Since we don't measure employee skills or occupation in our data, there is little we can do to directly distinguish between these various hypotheses. Nevertheless, our view is that because there are fewer occupational distinctions in small firms, interfirm segregation in our sample is unlikely to be *purely* a proxy for occupational segregation. This view is consistent with previous studies of large firms that find substantial intraoccupational interfirm segregation (for example, Blau 1977; Bielby and Baron 1984; Groshen 1991).

IV. Interfirm Segregation and the Gender Earnings Gap

The previous section documented substantial interfirm gender segregation. In this section we assess the role of segregation in accounting for women's low annual earnings. Most studies focus on male/female differences in hourly wages rather than annual earnings, which is appropriate given the longer annual hours worked by men. Unfortunately, we cannot follow this tradition because the CBO only records average annual earnings within a firm.³² We therefore study the male/female gap in annual earnings, while acknowledging that these findings do not apply directly to hourly wages. The fact that we have only firm average earnings also means that we cannot directly measure the contributions of intrafirm earnings inequality to the overall gender earnings gap. However, we combine CBO and CPS information to crudely measure the contributions of intrafirm and interfirm inequality to the gender gap in annual earnings.

To assess the relative contribution of interfirm segregation to the male/female annual earnings gap, decompose person i 's earnings at firm j into

$$(3) \quad Y_{ij} = Y_j + \Delta_{ij}$$

where Y_{ij} = person i 's earnings at firm j , Y_j = average earnings at firm j , and Δ_{ij} = the deviation of person i 's earnings from firm j average earnings. Mean earnings for women and men can then be written as

$$(4) \quad \bar{Y}_f = \frac{1}{N_f} \sum_{i=1}^{N_f} (Y_j + \Delta_{ij})$$

$$(5) \quad \bar{Y}_m = \frac{1}{N_m} \sum_{i=1}^{N_m} (Y_j + \Delta_{ij})$$

31. Note that this explanation must include a rationale for why business owners owned by less educated male owners need male skills more than businesses owned by more educated males or females.

32. To be precise, the survey records each firm's annual payroll and the number of employees for a given week. Each of these figures are gathered from IRS payroll records and not from retrospective questions. To estimate the mean annual earnings for employees of the firm, we divide the annual payroll by the number of employees.

where N_f and N_m are the number of women and men, respectively, in the sample. By simple extension, we can then decompose the difference between men's and women's mean earnings into the following components:

$$(6) \quad \bar{Y}_m - \bar{Y}_f = \left\{ \frac{1}{N_m} \sum_{i=1}^{N_m} Y_j - \frac{1}{N_f} \sum_{i=1}^{N_f} Y_j \right\} + \left\{ \frac{1}{N_m} \sum_{i=1}^{N_m} \Delta_{ij} - \frac{1}{N_f} \sum_{i=1}^{N_f} \Delta_{ij} \right\}.$$

In this decomposition, the first bracketed term on the right-hand side represents the component attributable to the fact that men work in high-paying firms. We can estimate this interfirm component from the CBO by simply assigning the firm-average earnings to each of the firm's employees, male or female. The second term represents the component due to the fact that, within any given firm, men are paid more than women. Since we don't know how earnings are distributed within our CBO firms, we cannot estimate this component directly from either the CBO or the CPS. However, we can compute the total earnings gap ($\bar{Y}_m - \bar{Y}_f$) from the CPS and, by subtraction, we can estimate the intrafirm component.

Table 8 presents estimates of this decomposition for the entire sample, and separately for selected two-digit industries. Column (1) reports our estimate of the contribution of interfirm segregation to the male/female earnings gap, as computed from the CBO. Column (2) reports the total gender earnings gap as computed from the May 1983 CPS that recorded information on 1982 labor market experience.³³ In these tabulations, we restricted our CPS sample to those workers that reported working for a firm with less than 100 employees. We computed Column (2) for the entire sample of workers that worked for such small firms and, separately, for a sample that excluded managers and other professional occupations.³⁴ The rationale for this latter exclusion is that our focus on the employees (as opposed to the owners) of small businesses eliminates most managers and professionals from our CBO sample. Therefore, the nonmanager/nonprofessional CPS sample is perhaps closer to the occupational mix that we survey in the CBO. Column (3) reports the fraction of the total gender earnings gap *potentially* attributable to interfirm segregation. This fraction is simply the ratio of (1) to the appropriate Column of (2). Again, we do this for both the all-occupation and the nonmanager/nonprofessional CPS samples.

33. Readers familiar with the CPS will recognize that the retrospective information on 1982 labor market experience was actually collected in March, not May. However, the CPS matches the March answers to the May answers prior to distribution. There is a small complication in that the questions about firm size refer to jobs held in May, 1983 while the information on earnings refers to jobs held in 1982. For a small fraction of the population, these may not be the same jobs.

To be included in our CPS sample, a worker had to 1) be between the ages of 18 and 65, 2) be a private sector worker, 3) not be self-employed, 4) have worked more than five weeks in 1982, 5) have worked more than five hours per week in 1982, 6) be currently in the labor force, and 7) have earned more than 500 dollars in 1982.

34. We should note that average employee earnings in the CBO are about 25 percent less than average earnings in the CPS. This occurs because CPS earnings include income from moonlighting jobs, black market income, and certain other sources whereas the CBO only records IRS-reported income from a single employer. As a result, these decompositions may misstate the relative contribution of interfirm segregation to the gender earnings gap. Unfortunately, we can only guess at the likely direction of any biases imparted.

Table 8
Decomposing the Small Firm Gender Earnings Gap into Interfirm and Intrafirm Components

	(1)	(2)		(3)	(4)
	Interfirm Gender Log Earnings Gap (CBO)	Total Gender Log Earnings Gap (CPS)		Fraction of total gender earnings gap potentially attributable to interfirm segregation: (1) ÷ (2)	Fraction of total gender earnings gap explained by education, age, annual hours, and major occupation
		All Occupations	Excluding Managers, Professions	All Occupations	All Occupations
Total	0.35	.64	0.61	0.55	0.49
<i>Selected Industries (SIC code)</i>					
General building contractors (15)	0.07	0.48	0.43	0.15	0.00
Food products manufacturing (20)	0.07	0.58	0.56	0.12	1.29
Apparel manufacturing (23)	0.00	0.59	0.49	0.00	0.56
Printing and publishing (27)	0.15	0.54	0.50	0.28	0.29
Rubber and plastics (30)	0.15	0.60	0.39	0.25	-0.69
Nonelectrical machinery (35)	0.30	0.37	0.38	0.81	0.16
Trucking and warehouse (42)	0.34	0.44	0.51	0.77	0.38
General merchandise stores (53)	0.17	0.71	0.74	0.24	—
Food stores (54)	0.15	0.48	0.48	0.31	0.59
Apparel and accessories stores (56)	0.27	0.44	0.33	0.61	0.37
Real estate (65)	0.08	0.17	0.08	0.47	-0.08
Business services (72)	0.12	0.46	0.26	0.26	0.38
Personal services (73)	0.37	0.39	0.28	0.95	0.37
Auto repair services (75)	0.22	0.35	0.36	0.63	0.29
Health services (80)	0.01	0.48	0.16	0.02	0.53
Cross-industry mean	0.16	0.47	0.40	0.39	0.30
Cross-industry standard deviation	0.11	0.13	0.16	0.16	0.42

Notes: All data drawn from the 1982 Characteristics of Business Owners survey and the May, 1983 CPS. See text for description of the decomposition. The CPS figures in Column (2) are computed solely on the basis of those workers employed in firms with less than 100 employees.

We emphasize the word “potentially” in describing Column (3) because firms can vary in the occupations, human capital, and annual work hours of their employees and, as a result, interfirm differences in earnings may merely reflect interfirm segregation on these other dimensions. While it is impossible to address this issue directly with the data at hand, Column (4) of Table 8 assesses the ability of these other dimensions to explain the role of interfirm segregation. In particular, we estimated industry-specific OLS regressions in which the dependent variable was log annual earnings. The independent variables included quadratic terms in education, age, and log annual hours, dummy variables for the CPS’ *major* occupations, and a female dummy. Column (4) reports for each industry the value of

$$\frac{(\text{unadjusted log earnings gap} - \text{estimated female dummy})}{(\text{unadjusted log earnings gap}),}$$

which shows the fraction of the within-industry earnings gap explained by age, education, hours, and major occupation.³⁵

The *TOTAL* row of Table 8 is our estimate of the decomposition for the entire small-firm economy. Among all occupations, mean women’s log earnings are .64 less than mean men’s log earnings. Of this overall difference, .35, or 55 percent, is potentially attributable to the different distribution of men and women across small firms. The *TOTAL* decomposition is largely unaffected by the exclusion of managers and professionals. Column (4) indicates that gender differences in education, age, annual work hours, and major occupation can explain roughly 49 percent of the gender earnings gap. The similar fractions accounted for by interfirm segregation and the other factors means that, for interfirm segregation to be solely a proxy for these other factors, there would have to be almost zero *intrafirm* gender differences in annual hours, major occupation, etc. Since we suspect that there are *intrafirm* gender differences in these factors, we ascribe some role to interfirm segregation in generating the gender earnings gap.

Because the apparent role of interfirm segregation may be an artifact of the different industrial distributions of men and women, the rest of Table 8 reports the results of within-industry decompositions. The results vary. While interfirm segregation explains almost none of the gender earnings gap in industries such as apparel manufacturing or health services, it plays a large role in many other industries. For example, interfirm segregation can explain 81 percent of the earnings gap within the nonelectrical machinery industry and 61 percent of the gap within apparel and accessory stores. If we exclude managers and professionals, then interfirm segregation can explain 132 percent (!) of the earnings gap among small firms in the personal services industry.³⁶ In summary, it appears that interfirm segregation is often an important source of women’s lower earnings.

Before moving on, we should emphasize again the tentative nature of these results. The results suggest that within many industries, interfirm segregation

35. It would have been preferable to include more detailed occupational measures, but the within-industry samples were too small to support such a specification.

36. The implication here is that women tend to work in low-paying firms, but that they tend to get paid more than men within any given firm.

explains a larger fraction of the gender earnings gap than do gender differences in age, education, annual hours, and major occupation. It is well-known, however, that there is substantial gender segregation within narrowly defined occupations or job titles (Bielby and Baron 1984), so it is possible that wage differences ascribed here to interfirm segregation may only reflect interfirm differences in the use of detailed occupations. While there is little we can do with the present data to address this issue, previous authors (for example, McNulty 1967; Buckley 1971; Blau 1977; Groshen 1991) have studied *intraoccupational* interfirm segregation, and they have typically found an important role for interfirm segregation, even within quite narrowly defined occupations. Therefore, our tentative conclusion is that interfirm intraoccupational segregation is an important source of the small firm gender earnings gap.

Table 8 shows that firms that employ women pay less than firms that employ men. Why is this so? Table 9 explores this issue with firm-level OLS regressions where the dependent variable is log payroll per employee. We compute the regressions for our full sample and separately by the sex of the owner. Our primary interest is in the coefficients on the fraction of the firm's employees that are women, which are listed in the top rows of the table. The left out group is those firms with between 75 and 100 percent female employees, so that the coefficients estimate the effect of being in a particular group compared with a similar firm with almost entirely female employees. In addition, each regression includes reported controls for firm size (a spline), owner education, owner sex, and fraction of female employees in the firm's two-digit industry, and unreported controls for owner's age and marital status, firm age, and region.³⁷ Within each of the three samples, we compute regressions without controls (Columns 1, 3, and 5) and with controls (Columns 2, 4, and 6) for log receipts per employee.

The coefficients on "Percent women employees within the firm" in Column (1) show that firms with mostly male employees pay substantially more than similar firms with very few male employees. For example, Column (1) suggests that firms with between 10 and 24 percent women employees paid their employees roughly 40 percent more than similar firms that had almost entirely female workforces. It is a bit puzzling that the relationship between "percent female" and average earnings is non-monotonic. One hypothesis is that firms with no women employ blue-collar men while firms with a few women are a mix of many professional men and a few administrative women. Whatever the explanation, it remains true that the general relationship between "percent female" and average earnings is decreasing.

While our primary interest is in the "percent women employees" coefficients, the other independent variables have sensible measured effects. For example, the coefficients on the log employment spline show that employees of larger firms receive higher annual pay, a result consistent with earlier work on hourly wages (for example, Brown, Hamilton, and Medoff 1990). We also find a fairly strong link between the education of the owner and employee pay, which may occur

37. These unreported coefficients were, in our view, either small or unremarkable. Results of the full regressions are available from the authors upon request.

Table 9
The Determinants of Average Employee Earnings in Small Firms

Variable	All Firms		Male-owned Firms		Female-owned Firms	
	(1)	(2)	(3)	(4)	(5)	(6)
Percent women employees within the firm						
0 percent	0.186 (0.043)	0.053 (0.034)	0.203 (0.052)	0.068 (0.041)	0.228 (0.084)	0.062 (0.066)
1-9 percent	0.144 (0.038)	0.009 (0.029)	0.170 (0.048)	0.018 (0.038)	0.077 (0.063)	0.008 (0.048)
10-24 percent	0.362 (0.052)	0.108 (0.043)	0.366 (0.060)	0.118 (0.049)	0.368 (0.110)	0.105 (0.092)
25-49 percent	0.259 (0.044)	0.086 (0.036)	0.288 (0.049)	0.125 (0.043)	0.174 (0.101)	-0.023 (0.075)
50-74 percent	0.093 (0.039)	0.028 (0.031)	0.110 (0.047)	0.053 (0.037)	0.058 (0.071)	-0.011 (0.055)
Spline in log (number of employees)						
Main effect	0.033 (0.015)	0.202 (0.012)	0.051 (0.017)	0.204 (0.015)	-0.011 (0.028)	0.197 (0.022)
Added effect for firms with more than 15 employees	0.037 (0.066)	-0.230 (0.043)	-0.012 (0.069)	-0.234 (0.050)	0.213 (0.123)	-0.187 (0.084)
Education of owner	0.019 (0.004)	0.006 (0.003)	0.020 (0.005)	0.005 (0.004)	0.017 (0.008)	0.009 (0.006)
Sex of owner (male = 1)	0.149 (0.028)	0.014 (0.021)	—	—	—	—
Fraction women employees in						
Two-digit industry	-0.272 (0.079)	0.139 (0.065)	-0.322 (0.093)	0.071 (0.079)	-0.148 (0.156)	0.264 (0.121)
Log (receipts/employees)	—	0.551 (0.031)	—	0.539 (0.016)	—	0.577 (0.023)
One-digit industry dummies	yes	yes	yes	yes	yes	yes
Adjusted R-square	0.110	0.445	0.084	0.408	0.130	0.486
Number of observations	4,562	4,562	3,231	3,231	1,331	1,331

Notes: All data drawn from the 1982 Characteristics of Business Owners survey. Each column reports the coefficients from a regression where the dependent variable is log average employee earnings and the unit of observation is a firm. In addition to the independent variables reported above, the regressions also included controls for the age and marital status of the owner, the age of the firm, and region. Standard errors are in parentheses.

because highly educated owners employ more high-skill workers. We find that male owners pay more than female owners, holding these other things constant. And finally, we find a strong relationship between annual pay and the proportion of women employees in the two-digit industry, even controlling for the fraction of women in the firm. This may reflect the fact that industries that employ mostly women use more part-time or low-skill workers. Alternatively, industry segregation, something we do not study here, may itself be an important determinant of women's reduced earnings.

Column (1) is quite consistent with Becker's theory in that employers with a taste for discrimination employ men, but they pay a higher price for indulging that taste. However, Becker's theory carries the additional implication that discriminating employers do not generally sell the product of their employees' labor for a higher price. In contrast, theories of segregation based on gender differences in human capital argue that women are paid less because they are less productive (for example, Mincer and Polachek 1974). Extending this logic, the discrimination hypothesis posits that the earnings of "female" firms should be lower even when we control for the receipts of the firm, while the human capital hypothesis posits that earnings of "female" firms should be no different from those of "male" firms once we control for receipts.³⁸ Column (2) of Table 9 evaluates these hypotheses by extending the specification of Column (1) to include log receipts per employee. Inspection of Column (2) shows that the coefficients on "percent women employees," while still significant, are greatly attenuated by the addition of log receipts to the equation. This suggests that a primary reason for the reduced earnings of women is that their labor output is less valuable. While consistent with segregation due to human capital differences or customer discrimination, this finding is more difficult to square with employer discrimination.

Columns (3) through (6) of Table 9 present another imperfect way of trying to get a handle on the role of discrimination in the gender earnings gap in these small firms. In these columns, we repeat the regressions of Columns (1) and (2) separately for our samples of male- and female-owned businesses. Inspection shows that there is little difference between the two samples in the relationship between "percent female" and average employee earnings. Therefore, female-owned businesses are no less likely to pay male workers more than female workers.

In summary, this section has shown that interfirm segregation accounts for a substantial portion of the male/female earnings gap. Firms that employ primarily men typically pay substantially higher salaries than firms that employ primarily women. To an unknown extent, the estimated effect of interfirm segregation is merely a proxy for male/female differences in annual hours and occupation that also have an interfirm component. However, previous research on hourly wages suggests that interfirm segregation is unlikely to be *only* a proxy for these other factors. Although we can say little about the fundamental cause of women's reduced earnings, interfirm segregation is probably an important factor in women's reduced earnings among small firm employees.

38. We are grateful to an anonymous referee for suggesting this specification.

V. Conclusion

This paper has studied interfirm segregation in the small firms. Consistent with earlier studies of large firms, we found substantial segregation of women into lower paying firms. One can interpret this fact with models of discrimination (for example, Becker 1971) or with models of differential human capital accumulation (for example, Mincer and Polachek 1974). More detailed analysis provided mixed support for both models. On one hand, male employers employ fewer women and pay higher wages, both facts consistent with models of employer discrimination. On the other hand, the higher salaries of male-employee firms are largely explained by their higher revenues, a fact consistent with human capital models or with theories of customer discrimination. In the final analysis, both phenomena are probably important and we are only marginally more able to sort out their relative importance than were previous authors.

In conclusion, we note some implications for the likely effect of proposed comparable worth programs. As Johnson and Solon (1986) have emphasized, the most widely mooted comparable worth policies reduce the interoccupational wage gap *within firms*. Yet our results suggest that much of the gender wage gap is due to interfirm segregation. In this regard, it is irrelevant whether interfirm segregation proxies for segregation by job title or occupation. The fact is that reducing within-firm pay differences will leave a large fraction of the gender earnings gap untouched.

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