

Investigating the link between competition and discrimination

Evidence suggests that increased international trade in manufacturing and deregulation in the banking industry may have helped reduce discrimination against women in these industries

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How competition affects the ability of companies to favor particular groups is a longstanding issue in the economics literature. In a seminal work published in 1957, economist Gary Becker argued that, over the long run, product market competition would drive discrimination out of the marketplace.¹ Becker's model as applied to the labor market can be described in relatively general terms: employers with a "taste for discrimination" will forego profits in order to indulge their desire to employ a specific type of worker. For example, employers with a taste for discrimination against women will employ less than the profit-maximizing number of women. Instead, they will hire a greater number of equally skilled but more highly paid men. Thus, in a perfectly competitive market, nondiscriminating employers can gain a cost advantage and ultimately drive discriminating employers out of business. Becker's model suggests that the wage gap between men and women will therefore decline as discriminators are forced to leave the market altogether.

Becker goes on to say that where markets are not perfectly competitive—that is, markets in which companies face little product market competition—discriminating employers can exist in the market indefinitely. Given the lack of transparency surrounding the practice of discrimination, it has been difficult to test Becker's theory. By identifying shocks to competition in a market with limited product market competition, however, it is possible to explore some of the

dynamic implications of his model. Specifically, this article looks at how intensified trade in manufacturing and deregulation in the banking industry may have reduced firms' ability to discriminate against women.

Two studies

Two recent studies by this author and colleagues focus on the effects of increased competition on firms' ability to discriminate against certain groups of employees.² Each study isolates a discrete shock to competition from some outside source and examines the resulting labor market effects. Although the studies examine two different kinds of shocks, the general conclusion is the same: increased competition—either in the form of increased trade or deregulation—appears to hinder the ability of firms to discriminate.

International trade and discrimination. In the first of the two studies, the present author and Elizabeth Brainerd look at competition across industries and investigate how an increase in international trade has affected the relative wage position of women. In firms that could discriminate against women because of a noncompetitive environment, the demands of increased trade should help reduce discrimination and thereby improve the relative wage position of women. This assumption is tested by comparing historically *concentrated* or noncompetitive industries that have faced increased pres-

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sure from international trade to historically *competitive* industries that have faced similar pressures. In theory, competitive industries should not be able to discriminate even in the absence of trade. Thus, by controlling for the general effect of trade, the effect of increased competition on the wages of women relative to men can be isolated and measured.

Deregulation and discrimination. In the second study, the present author and Philip E. Strahan examine the banking industry to see what happens to relative wages when an industry faces a shock to product market competition. The history of deregulation in the industry provides an excellent body of empirical data to study the relationship between competition and women’s pay. When government regulations restricted the entry into and expansion of the banking industry, firms earned rents that could be spent in a variety of ways. The results of the second study show that these rents were shared with employees but disproportionately with men. The structure of wages after deregulation was then examined to assess whether more competition helped increase the relative wages of women.

Effects of increased trade

A notable increase in international trade is one type of shock that would tend to expose an industry to greater competition. Although increased trade should limit the ability of firms to favor particular groups of workers within an industry, it also may affect wages through other channels as well. For example, because imported goods tend to be produced by relatively low-skilled workers, increased trade may actually decrease the wages of low-skilled workers in the United States. Thus, if women are disproportionately represented among low-skilled workers, then the overall effect of increased trade may be a lowering of the relative wages of women—even if discrimination had been reduced by the increase in trade.

To control for such differences in skill level and other characteristics, the focus of the analysis is narrowed. Instead of comparing the wages of women in industries affected by trade with those of women in industries not affected by trade, the focus here is on the wage effects in industries in which the level of competition differed before the trade shock. Because industries that were already competitive would not be able to afford to discriminate before an increase in trade, increased competition should have little or no effect on an industry’s ability to favor certain groups of employees. In less competitive industries, on the other hand, increased trade should reduce firms’ tendency to discriminate. By comparing the effects of trade on the relative wages of women in concentrated versus competitive industries, the effects of discrimination can

be isolated.

The estimation can be expressed as

$$\left(\begin{array}{l} \text{change in gender} \\ \text{wage gap in} \\ \text{trade-impacted} \\ \text{industries} \end{array} \right) - \left(\begin{array}{l} \text{change in gender} \\ \text{wage gap in} \\ \text{non-trade-impacted} \\ \text{industries} \end{array} \right) \text{concentrated industry}$$

$$- \left(\begin{array}{l} \text{change in gender} \\ \text{wage gap in} \\ \text{trade-impacted} \\ \text{employees} \end{array} \right) - \left(\begin{array}{l} \text{change in gender} \\ \text{wage gap in} \\ \text{non-trade-impacted} \\ \text{employees} \end{array} \right) \text{competitive industry}$$

The estimation nets out any factors that may have affected the gender wage gap in manufacturing industries, trade-impacted industries as a whole, or concentrated industries as a whole.

The analysis covers the 1977–94 period and is based on data drawn from the Current Population Survey (CPS) for individuals aged 18 to 64 who worked full-time in the civilian sector in the year before the survey.³ The change in the residual gender wage gap—the dependent variable—is calculated by first regressing the log wage of all the individuals in the sample on the following variables: four categories of education level (less than a high school diploma, high school diploma, some college but no degree, and at least a bachelor’s degree), age, age squared, and a nonwhite dummy variable. The residual gender wage gap is then calculated as the difference in the average residual wages for men and women at the industry level. The industry-level results are then matched to industry-level trade data from the National Bureau of Economic Research Trade Database, with trade measured as import shares.⁴ Finally, an industry is classified as concentrated if in 1977 the four-firm concentration ratio was 0.40 or greater in the Census of Manufactures conducted in that year.⁵

The findings indicate that a 10-percentage point increase in import share in concentrated industries leads to a decline in the residual gender wage gap of about 6.6 percent, relative to competitive industries. To understand the magnitude of this estimate, consider that the average increase in import share in concentrated industries accounts for a decline in the residual gender wage gap in manufacturing of about 0.034 log points. By contrast, during the 1977–94 period, the overall decline in the residual gender wage gap was approximately 0.14 log points. Although a positive relationship between increased trade and reduced discrimination against women is observed, the findings also show that trade as a whole is having a negative effect on the relative wages of women. This negative effect is only somewhat offset by the improvement in women’s relative wages due to the decline in discrimination.

These results are tested for sensitivity in several ways.

First, the same estimation strategy is applied to two other data sets—the outgoing rotation of the Current Population Survey from 1979 to 1994, and the 1980 and 1990 Censuses—and similar results are obtained. Second, the effects of trade on the residual gender wage gap are estimated using the metropolitan statistical area as the unit of observation. These adjustments yield relatively robust results.

Other factors could explain the findings as well. For example, one might argue that the results reflect a decline in unionization rather than a reduction in the ability of firms to discriminate. Because of higher rents, concentrated industries are likely to be more highly unionized than competitive industries, and men are more highly unionized, on average, than women. Given these differences in unionization, a decline in unionization rates over the 1977–94 period would likely reduce the gender wage gap more in concentrated industries than in competitive industries. To ensure that the results presented here do not reflect such a shift, the industry-level change in unionization is included in the regression. Despite the addition of this variable, however, the results remain the same.

To gain further evidence that the results of this study capture the effect of competition on discrimination, the employment and occupational status of women in the two samples of companies are examined. In a discriminatory environment, firms would be expected to hire fewer women and to keep them in lower positions. Looking at the change in the percentage of women employed in an industry, weak evidence was found that the employment of women increased more in concentrated industries with increased trade than in the already competitive industries with the same increase in trade. Next, the change in the percentage of managers who are women was examined, finding that this percentage increased more significantly in historically concentrated industries affected by trade. These results are consistent with the conclusion that competition reduces firms' ability to discriminate against particular types of employees.

Effects of deregulation

These across-industry results from the study by the present author and Elizabeth Brainerd provide some support for Becker's theory.⁶ The second study by this author and Philip E. Strahan looks at one industry and focuses on wage practices at the firm level.⁷ Although, as a general rule, identifying exogenous shocks to competition at the industry level is difficult to do, deregulation provides an exception to the rule.

Other single-industry studies have focused on the cross-sectional variation in concentration in order to explore the relationship between product market competition and firm discrimination against women. Using cross-sectional data from New

Jersey and Pennsylvania, for example, Orley Ashenfelter and Timothy Hannan compare markets in the banking industry that are more concentrated to markets that are less concentrated.⁸ Their results show a negative relationship between market concentration and the share of female employment in each bank, a finding that is consistent with the notion of increased discrimination in concentrated markets.⁹

In the study by this author and Philip E. Strahan, the authors use a unique event in recent history—the deregulation of state-level restrictions on bank expansion—to test the effect of increased competition on the labor market. Until the 1970s, banks' ability to enter new markets was constrained—only twelve states allowed unrestricted statewide branching. Over the subsequent 25 years, states gradually lifted these restrictions and banks were able to enter new markets, either by opening branches or by owning banks in multiple states. This study provides evidence suggesting that, before deregulation, rents were shared with labor and that these rents were shared disproportionately with men. This finding suggests that discrimination against women is more likely to occur in the absence of competition.

Banking deregulation provides a valuable laboratory to explore the effects of regulations restricting market entry. Before deregulation, firms in the banking industry were earning rents because of the limited competition in the industry. Deregulation provided an exogenous shock to competition, which led to a decline in rents as firms were forced to improve efficiency and lower prices in order to compete more effectively.

It is important to note that deregulation in banking occurred at the State level, which is quite different from national deregulation of such industries as telecommunications and transportation. Studies that look at national deregulation cannot control for aggregate trends. By contrast, because banking deregulation occurred across States at different times, it is possible to eliminate the effects of national trends in the industry as well as the State-specific effects. For example, banking wages have been rising over the past two decades—from about \$30,000 per year in 1976 to about \$40,000 in 1996 (both in 1997 dollars). Simply looking at wages before and after this period of deregulation may lead to the false conclusion that deregulation had caused the increase in wages. In fact, however, the findings of this study show that deregulation led to falling wages.

For the estimation, data from the Current Population Survey for the 1977–97 period were used, focusing again on full-time workers aged 18 to 64 who are not self-employed, working without pay, or in the military.¹⁰ The use of individual-level data allows for the removal of State-specific trends that are common to all workers in a State, State-specific effects on wages in banking, and banking-specific trends. The estimation

can be expressed as

$$\left(\begin{array}{l} \text{change in wages} \\ \text{of banking} \\ \text{industry} \\ \text{employees} \end{array} \right) - \left(\begin{array}{l} \text{change in wages} \\ \text{of non-banking} \\ \text{industry} \\ \text{employees} \end{array} \right) \text{ deregulated State}$$

$$- \left(\begin{array}{l} \text{change in wages} \\ \text{of banking} \\ \text{industry} \\ \text{employees} \end{array} \right) - \left(\begin{array}{l} \text{change in wages} \\ \text{of non-banking} \\ \text{industry} \\ \text{employees} \end{array} \right) \text{ non-deregulated State}$$

To test whether rents were shared with labor in the regulated environment and whether they were shared unevenly among men and women, changes in compensation and wages following deregulation are estimated. After controlling for trends in the banking industry and State-specific trends, it was found that average compensation and average wages for banking employees fell (or rose less than the trend) after States deregulated restrictions on bank branching to a statistically significant degree. The estimate is robust across different data sets and model specifications and cannot be explained by shifts in relative employment demands after deregulation. In addition, it can be shown that the decline cannot be explained by a change in observable skills. This suggests that rents were indeed shared with employees.

How much are firms able to discriminate? To test for a change in discrimination, the behavior of wages for men and women after deregulation was examined. Male wages fell about 12 percent after deregulation, while women’s wages fell only 3 percent. This difference is statistically significant and suggests that before deregulation, rents were shared with men more than with women. This finding is consistent with the theory that competition reduces a firm’s ability to spend rents on favored groups.

As a check to this estimation, the effects of deregulation on the industry’s occupational structure are examined. A discriminating employer may prefer to keep women in lower positions than their skills warrant. The findings are consistent with discrimination: the share of women holding managerial positions increased after deregulation. The share of women in managerial positions increased by about 4 percentage points or about 10 percent of the mean. These results support the theory that a lack of competition can promote costly discrimination. When competition increases, firms appear to be forced to improve the occupational status of women to cut costs. Looking within occupation groups, it appears that women’s relative wages improved after deregulation in part because their relative wages within their occu-

pation improved and in part because they moved into higher skilled occupations.

A key concern is that these findings may simply reveal a decline in the demand for labor. To test for shifts in labor demand, therefore, the change in the percentage of workers in the banking industry in each State was examined. The analysis finds no significant decline in this percentage after deregulation, which suggests that it is not simply a shift in labor demand. In sum, it appears that an environment of increased product market competition reduces employers’ ability to practice discrimination.

ECONOMIC THEORY HOLDS THAT competition forces companies to eliminate the practice of discrimination. In the short term, employers with a “taste for discrimination” will ignore cost-effective practices in order to indulge their desire to employ specific workers. Over the long run, theory predicts that these companies will be outstripped by their nondiscriminating competitors and forced out of the market. This theory is explored by examining how two recent competition shocks—increased trade and deregulation—have affected women’s wages relative to men’s wages.

An earlier study by this author and Elizabeth Brainerd looks at increased international trade across manufacturing industries. Using recent survey data, the study compares the impact of trade on women’s wages in concentrated industries with the impact of trade in competitive industries. Because competition is historically low in concentrated industries, the hypothesis was developed that opportunities for discrimination are more available in this segment of manufacturing. Once competition (in the form of increased trade) arrives, however, employers’ ability to discriminate should decrease. As one would expect, the residual gender wage gap narrowed more rapidly in the concentrated industries that experienced a trade shock than in the competitive industries that experienced the same type of shock.

Another study by this author and Philip E. Strahan looks at how increased competition brought about by banking deregulation affected firms’ ability to discriminate.¹² The banking industry provides a unique opportunity to isolate potential employer bias because deregulation occurred on a State-by-State basis at different times over a period of two decades. It was found that increased competition from deregulation reduced firms’ ability to allocate rents disproportionately to men. The study also found that the gap between the wages of men and women declined after deregulation. The decline occurred because women’s occupational status improved after deregulation and because male wages fell more significantly than female wages. As in the earlier study, these results support the view that increased competition helps drive discrimination out of the marketplace. □

Notes

¹ Gary S. Becker, *The Economics of Discrimination* (Chicago, University of Chicago Press, 1957).

² See Sandra E. Black and Elizabeth Brainerd, "Importing Equality? The Effects of Increased Competition on the Gender-Wage Gap," Staff Report 74 (Federal Reserve Bank of New York, 1999); and Sandra E. Black and Philip E. Strahan, "The Division of Spoils: Rent-Sharing and Discrimination in a Regulated Industry," unpublished, 1999. Both papers are available from the author upon request. Contact the Federal Reserve Bank of New York, Market Analysis Group, or e-mail the author at sandra.black@ny.frb.org.

³ A "full-time" worker is defined here as one who worked at least thirty hours in their usual workweek and worked more than forty-eight weeks in the previous year. Individuals who reported being self-employed or working without pay are excluded from the sample. The wage data refer to real weekly earnings in the previous year (in 1982 dollars). Workers earning less than \$67 in weekly wages (in 1982 dollars) are excluded.

⁴ See Robert C. Feenstra, "U.S. Imports, 1972–94: Data and Concordances," Working Paper 5515 (National Bureau of Economic Research, March 1996).

⁵ A four-firm concentration ratio represents the share of total indus-

try sales accounted for by the four largest firms in the industry. For more information on the Census of Manufactures, visit the official website of the Bureau of the Census at <http://www.census.gov/>.

⁶ See Black and Brainerd, "Importing Equality?"

⁷ See Black and Strahan, "The Division of Spoils."

⁸ Orley Ashenfelter and Timothy Hannan, "Sex Discrimination and Product Market Competition: The Case of the Banking Industry," *Quarterly Journal of Economics*, February 1986, pp. 149–73.

⁹ More recently, Judith K. Hellerstein, David Neumark, and Kenneth R. Troske—in "Market Forces and Sex Discrimination, Working Paper 6321 (National Bureau of Economic Research, December 1997)—use establishment level data to look at firms with market power. This study finds that, as economic theory predicts, the firms that employ a greater number of women have higher profits.

¹⁰ Note that bank-level data also are used in the first part of the analysis to demonstrate that, prior to deregulation, rents were shared with workers.

¹¹ See Black and Brainerd, "Importing Equality?"

¹² See Black and Strahan, "The Division of Spoils."