SEX DISCRIMINATION AND PRODUCT MARKET COMPETITION: THE CASE OF THE BANKING INDUSTRY*

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This paper examines the relationship between product market competition and employment discrimination using an especially constructed data set that links microeconomic data on female employment with measures of market concentration in the banking industry. The use of firm-specific data drawn from this one industry allows estimation of this relationship in a manner that avoids the problems of interindustry differences that have troubled previous studies. The results provide strong support for a negative relationship between market concentration and the relative employment of women. Further, we find that individual market shares are unrelated to female employment, suggesting that the relationship is due primarily to differences across markets rather than individual firms.

I. INTRODUCTION

It is only in the last decade that the nature and extent of labor market discrimination based on gender has become a major issue for public policy.[1] A flurry of court decisions and consent decrees in settlement of court cases suggests that, at least in some circumstances, convincing evidence for the presence of sex discrimination in the labor market existed. A casual survey of the earliest and most dramatic of these court settlements leads to the unmistakable impression that the companies involved were, at the time of settlement, protected from at least some of the market forces present in the most competitive industries. In addition, many of these companies were protected from market forces by government regulation.[2] Whether the absence of vigorous product

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1. Although the 1964 Civil Rights Act protected women from discrimination in employment, as it did blacks, litigation involving women under this statute did not begin until considerably after its passage. Indeed, it was not until December 1971 that the office of Federal Contract Compliance of the U. S. Department of Labor issued Revised Order No. 4, which for the first time required affirmative action plans to specify goals and timetables for the hiring and promotion of female as well as minority employees. See Wallace [1976], Ch. 11.
2. In 1973 and 1974, consent decrees were negotiated between various government agencies and the Bank of America, Delta Airlines, a group of 349 trucking companies and their (two) unions, and AT&T. Each of these firms operates in an industry that has to some extent met with "deregulation."

TABLE I

STUDIES OF THE RELATIONSHIP BETWEEN EMPLOYMENT DISCRIMINATION AND MEASURES OF MARKET POWER

Authors	Sample	Unit of observation	Type of discrimination investigated	Measure of market power	Results
Becker [1957]	38 manufacturing industries in the south in 1940; nine occupational categories	Industry	Race	Dichotomous	Positive relationship for most job categories
Shepard [1969]	46 industries in 1967; class of white collar employment	Industry	Race	Four-firm concentration ratio	Positive relationship
Shepard and Levine [1973]	231 large industrial firms, 1966–1970	Firm	Race and sex	Market share, advertising intensity, size	Results mixed
Oster [1975]	56 manufacturing industries in 1960; eight professional occupations	Industry	Sex	Four-firm concentration ratio	No relationship for most occupations
Luksetich [1979]	44 industries in 1970; class of white collar employment	Industry	Sex	Four-firm concentration ratio	Positive relationship

market competition exacerbates the nature and extent of employment discrimination cannot be answered by such casual evidence, but it does serve to highlight this important and unresolved hypothesis. Our purpose in this paper is to test this hypothesis as it applies to sex discrimination using a data set that entails significant advantages over those used in previous studies of this question.

Arguments that noncompetitive product markets exacerbate labor market discrimination date from Becker [1957], Alchian and Kessel [1962], and Comanor [1973]. As summarized in Table I, the subsequent empirical tests have generated mixed results. A major problem common to these empirical studies is that they typically identify variability in product market competition by comparing measures of market concentration across industries. This raises two problems. First, market concentration is at best a proxy for market power (or inversely, market competition), and the nature of this proxy relationship no doubt varies across industries. Second, omitted industry characteristics, such as industry differences in the type of work performed within any given occupational category, may obscure or bias any relationship between market concentration and observed employment discrimination.[3]

To meet these difficulties, we have collected measures of the employment of women in managerial positions in individual commercial banks that operate in different, well-defined geographic markets. Because of the local nature of banking markets, these data allow us to identify variability in market concentration while at the same time avoid the severe problems associated with interindustry comparisons. Further, since we use individual bank employment data, we can analyze (a) the effect of an individual bank's local product market share on its employment practices *and* (b) the market-wide effect of concentration on the bank's employment practices. These data allow us to untangle the extent to which individual bank size, individual bank market share, and the concentration of the bank's product market affect employment practices.

Our motivation for this empirical analysis also has a more

3. Empirical studies of employment discrimination are, of course, not limited to those that focus on the role of market concentration. For an interesting view of the nature of sex discrimination and an analysis that uses detailed establishment-specific data, see Blau [1977]. Because of our focus on market concentration, a detailed discussion of such studies is beyond the scope of this paper.

practical nature. To date, very little useful information on the (stochastically) predictable determinants of employment discrimination has been produced by researchers in academic or regulatory organizations. The allocation of scarce litigation and investigative resources might usefully be affected if such findings were available. In this paper we show how data collected by two regulatory agencies (the Federal Reserve Bank of Philadelphia and the Equal Employment Opportunity Commission) can be merged for the purpose of investigating these determinants. There are no doubt many similar opportunities for such research awaiting exploration, and we hope that our example may lead others to investigate them.

The plan of the paper is as follows. The next section briefly discusses several different explanations that have been offered in support of a relationship between product market competition and firm employment discrimination. Section III describes the data, while Section IV discusses the variables and econometric methods employed in the test. Section V presents results, while the concluding section summarizes the findings and discusses the extent to which they may be generalized to other industries.

II. MARKET COMPETITION AND DISCRIMINATION

Several different lines of reasoning have been offered to suggest a positive relationship between market power and discriminatory behavior. If a relationship between market power and market concentration also exists (a question discussed more fully below), then these arguments imply a relationship between market concentration and discriminatory practices. We briefly present four such arguments. All focus on employer discriminatory behavior and all have in common the presumption that firm profits are inversely related to the level of discrimination chosen by a utility-maximizing employer.[4]

Differences in Employer Tastes

The first argument assumes the existence of a process whereby competitive environments become populated disproportionately by employers who exhibit relatively little or no taste for discrim-

4. This is not necessarily true of employee-induced discrimination, discussed more fully below.

ination. The process may be explained by supposing that initially there is a positive differential between the wages of men and women (in excess of any productivity differences) due to discrimination in the labor market in which individual firms operate. If differences exist in the discriminatory tastes of employers, then the least discriminatory firm, by virtue of the greater number of women it hires, will have lower labor costs than its more discriminatory counterparts. In the long run if the industry is competitive, relatively discriminatory firms will be forced to leave the industry. Thus, in a competitive environment the observed level of discrimination is governed by the least discriminatory employers. Higher levels of discrimination, however, may exist in noncompetitive environments, where the lack of competition and the presence of entry barriers allow the more discriminatory employers to continue to operate.

The notion of discriminatory employers being replaced by less discriminatory (or nondiscriminatory) ones may be ascribed to Becker [1957].[5] Becker qualifies this argument by noting that firms with monopoly power should be worth more to owner-managers with less discriminatory tastes. Thus, if the monopoly power is transferable, discriminatory owner-managers will sell their firms to those with less discriminatory tastes, thereby eliminating the presumed difference in tastes for discrimination across the two environments.

Whether or not this is a valid criticism of the above argument seems to rest on the nature of discriminatory tastes. If the discriminatory employer, upon selling the firm, loses nothing from the inability to discriminate (perhaps because discriminatory tastes reflect an aversion to associating with women in the work place), then it is true that the firm is worth more to individuals with less discriminatory tastes. If the ability to discriminate represents a valued asset that the discriminatory owner would lose upon selling the firm, then it is not necessarily true. Without further knowledge of the nature of discriminatory tastes, this issue must be left open.

5. Becker [1957, p. 46] also argues that the level of discrimination under monopoly will reflect the median discriminatory taste among employers, while that observed in competitive industries (assuming that the type of labor discriminated against is a minority) will be determined by an employer whose "discrimination coefficient" is lower than that of the median employer, even if no displacement occurs. Though related, this argument is clearly distinct from the one presented above.

The Income Effect

A second argument involves a straightforward income effect and the presumption that discrimination is a normal consumption good. We ascribe this argument to Comanor [1973, p. 372], although others have also referred to it with less detailed discussion. The argument is most easily made in the case of an owner-manager whose entire income is derived from the profits of the firm. Since a firm with market power is more profitable than its competitive counterpart, the income of such a firm's owner will be higher than that of the competitive firm's owner, all else equal. Higher income results in greater "consumption" of discrimination if discrimination is a normal good.

Some complications to this story are introduced once the owner-manager is allowed to hold additional assets. Under these circumstances, it is less clear that the individual who owns the firm with market power is also the wealthier individual. Unfortunately, little direct evidence exists concerning the relationship between monopoly rents and the wealth of firm owners.

The Profit Constraint

A third explanation for this relationship is built on the assumption of a profit constraint such as that imposed on utilities by rate-of-return regulation. Alchian and Kessel [1962], who first presented this argument, have suggested that its application is relatively general, since political pressures may present even non-regulated firms with an implicit profit constraint. With an externally imposed profit constraint, an employer sacrifices no profits by pursuing utility-enhancing discrimination up to the point where the constraint ceases to be binding. Because of the greater inherent profitability of the monopolist (or firm with market power), this is argued to result in a greater level of observed discrimination on the part of firms in noncompetitive environments.

The most serious question concerning this argument involves its application to firms not subject to rate-of-return regulation. Although it is possible that firms act as if they are subject to such a constraint even when it is not statutory, the reason why they should do so remains incompletely explained.

Monitoring Costs

A final argument focuses on the case in which owners and managers are not the same individuals and assumes that the

capital market and the market for managerial services punish deviations from profit maximization only imperfectly. Since managers under these circumstances, if unchecked by owners, forgo little or no monetary income in exchange for the benefits of increased discrimination, they may choose to discriminate at levels above that deemed optimal by the owners. If conditions in the output market influence the costs of monitoring the performance of managers, then it may influence the optimal level of monitoring undertaken by outside owners and thus the level of discrimination chosen by managers.

A few economists have argued that conditions in the output market influence the level of control that outside owners exercise over managers, though detailed analysis is hard to come by.[6] We offer one possible explanation by starting from the presumption that the probability that outside owners will assume inadequate performance on the part of the manager increases with the divergence of actual profits from maximum profits. Presumably, outside owners of firms operating in competitive and noncompetitive markets find it equally easy (or hard) to determine the actual profits of their firm. But can we say the same about their ability to determine maximum obtainable profits? Observable long-run competitive profits earned by other firms is a potential source of information on maximum obtainable profits to outside owners of competitive firms, but no such source of information exists for outside owners of monopolistic firms. Maximum profits in noncompetitive markets may vary across markets for many different reasons, and information on these determinants of maximum profits may be obtained only at considerable cost. If it is more costly for outside owners to obtain the necessary information, then they may optimally choose lower levels of monitoring and allow greater levels of discrimination on the part of their managers.[7]

6. Edwards [1977, p. 18], for example, notes that with imperfections in the goods market (along with imperfections in the capital market and the separation of ownership control), "the 'transactions costs' that stockholders must incur to exercise a significant degree of control over managers are too great to justify such efforts in all but the most extreme cases of managerial 'misbehavior.'"

7. All of the above arguments assume discriminatory tastes on the part of the employer and (absent a profit constraint) a negative relationship between firm profits and discriminatory behavior. Discrimination against women, however, may also originate with male employees, and it has been demonstrated [Oster, 1975] that the existence of employee discriminatory tastes may lead to discrimination that is consistent with profit-maximization. At issue in this study is whether or not employee-induced discrimination varies systematically across competitive and noncompetitive environments. In the absence of unions, which are not a factor in the banking industry, there is little reason to expect such systematic variation from employee-induced discrimination.

For the most part, our data will not allow us to distinguish among these competing explanations. The data will enable us, however, to test for this relationship in a manner that avoids many of the problems encountered in previous studies.

III. THE DATA

Several characteristics of the banking industry make it well suited for testing this hypothesis. First and most important, competition among banks for most of the different products or services of commercial banks (particularly during the time period considered) is geographically limited, thus allowing for variability in the competitive environment of firms within this one industry. Second, recognizing the local nature of competition among banks, bank regulatory authorities have in some cases devoted substantial effort in defining local banking markets. Third, since most banks are considered government contractors, data on the number of employees by sex and occupation as collected by the Equal Employment Opportunity Commission (and used in this study) are more extensive in the case of the banking industry than for most other industries.[8]

A final advantage concerns the much debated relationship between the exercise of market power and market concentration. Since in the empirical work to follow we must use market concentration as a proxy for market power, the validity of the market power hypothesis as it applies to banking is a central concern. The greater availability of data and the geographically restricted nature of bank competition has allowed researchers to investigate the relationship between market concentration and price, thus avoiding the well-known ambiguities of profit-concentration studies. Since these price-concentration studies generally confirm the predictions of the market power hypothesis,[9] this hypothesis has stronger empirical support for the banking industry than elsewhere.

It is also interesting to note that while no other study to our knowledge has focused on employment discrimination in this industry, studies by Edwards [1977], Hannan [1979], Hannan and Mavinga [1980], and Glassman and Rhoades [1980] have found

8. The EEOC collects these data for banks having 50 or more employees, while the size cutoff applying to other industries may be considerably higher.
9. These studies are reviewed in Rhoades [1982]. For a critique of some of these studies, however, see Gilbert [1984].

evidence of nonprofit-maximizing, expense-preference behavior similar to the type at issue here.[10] This suggests the possibility of similar behavior in banking firms as it applies to employment discrimination.

To the many advantages afforded by the banking industry, we must also add a disadvantage. The banking industry, unlike most industries, is highly regulated, and if the regulation is such that a ceiling is placed on allowable profits, then one may observe a positive relationship between market concentration and discrimination that may exist only because of the regulation (see Alchian and Kessel's argument above). Since regulation in the banking industry does not place a ceiling on profits,[11] this industry is not regarded as especially relevant to the Alchian and Kessel argument. For reasons to be discussed below, however, the regulated status of banking may nonetheless affect the degree to which our results may be generalized to other industries.

The specific sample we use consists of 120 banks operating in 43 different local banking markets in the states of Pennsylvania and New Jersey during 1976.[12] This section of the country was chosen to make use of detailed market definitions constructed by the Federal Reserve Bank of Philadelphia for the purpose of assessing the competitive impact of bank mergers and bank holding company acquisitions.[13] The year 1976 was chosen to avoid complications resulting from affirmative action considerations. Affirmative action pressures appear to have increased in later years, and since such pressures may confound any true relationship between market power and discriminatory behavior, 1976 was chosen as the earliest year for which a suitable sample could be obtained.[14]

10. An additional study by Rhoades [1980] and one by Schmirlock and Marshall [1983], however, fail to find a role for market concentration in explaining such behavior.

11. Indeed, much of bank regulation derives from the concern that bank profitability may not otherwise be adequate to guarantee the safety of the system.

12. This sample consists of the entire population of banks with 50 or more employees that operated in Pennsylvania and that portion of New Jersey falling in the third Federal Reserve District. Because of the lack of EEOC data for smaller banks, this sample consists of the largest 25 percent of banks in the region and accounts for 71 percent of the region's bank employees.

13. These markets were determined through the use of data on commuting and residential patterns and by surveying bankers and bank examiners familiar with local areas. A map displaying local banking markets is available from the authors upon request.

14. Conversations with officials in the Department of Labor suggest that affirmative action pressures increased sharply with the beginning of the Carter Administration in 1977.

Since discriminatory behavior is likely to be more pronounced, and therefore observable, for occupational categories involving close contact with the decision maker, we restrict our analysis to the occupational category termed "officials and managers."[15] Unlike some industries, the workers in this occupational category represent a considerable fraction of banking employees.[16]

IV. THE TEST

Since firms rather than industries constitute the unit of observation in this study, we assume (with greater justification than in most previous studies) a highly elastic supply of both types of labor. This justifies focusing on employment choice in examining firm discriminatory behavior. Individual firms, of course, may pay different wages to males and females as a result of wage differentials determined by discrimination in the labor market of which they are a small part, but differences in firm discriminatory behavior under this assumption are reflected primarily (if not exclusively) in terms of employment choice.[17] Our test consists of estimating the relationship between an index of firm employment choice and various potential determinants of that choice (including market concentration). We use the ratio of female to male "officials and managers" (denoted L_f/L_m) as a rough measure of the firm's employment practices vis-à-vis these two types of labor.[18]

The choice of an appropriate measure of market concentration is made difficult by the fact that there is little theoretical or empirical work to guide us. Thus, we have employed several different measures of market concentration in the empirical analy-

15. Perhaps because of this, previous interindustry studies of the relationship between employment patterns and market concentration have tended to find a stronger relationship for higher-skilled occupations. See, for example, Becker [1957].

16. Approximately 20 percent of all bank employees in the sample are in this category, while roughly 70 percent are considered office and clerical workers. Technicians and operatives comprise the remainder of bank employees as reported to the EEOC. The remainder of the extensive firm-specific data employed in the study was obtained from the FDIC Summary of Deposits, bank income and call reports, and in the case of the firm's ownership, confidential bank examination reports.

17. Since information on market wage differentials is not available, we include in estimations reported below numerous market characteristics in an attempt to proxy them.

18. Alternative use of the proportion of "officials and managers" that are female as the dependent variable and use of the linear functional form make no material difference to the results.

sis, including the three-firm concentration ratio, the Herfindahl index, and dichotomous measures of concentration. Since results are qualitatively the same, only regressions in which the three-firm concentration ratio ($CR3$) is employed are reported. We also include in some regressions a measure of firm market share. While some claim market share to be a firm-specific measure of market power [Greer, 1980, p. 54], others consider it a reflection of relative firm efficiency [Schmirlock and Marshall, 1984]. We report results obtained with and without this variable, recognizing that its role is a matter of some controversy.

Additional variables are introduced to account for other potentially important determinants of observed employment ratios. One such variable is designed to control for differences in the definition of what constitutes an "official or manager." Since the definition of this category is left largely to the discretion of each bank, wide variations may exist across the 120 banks in the sample. The category of "official or manager" is the highest ranking job category that a bank may register in the data collection process, and since positions in banks may exhibit higher proportions of females the less the level of responsibility involved, a bank wishing to mask an otherwise low level of L_f/L_m may do so by simply defining this job category broadly. Thus, we use the ratio of total employees in this category to total employees of the bank (MG/EMP) to control for the liberalness with which each bank defines the category. If positions involving less responsibility are "more female," then a positive sign on the coefficient of this variable is predicted.

To control for differences in the regulatory environments of the two states (Pennsylvania and New Jersey) that constitute the sample, we also include a dummy variable, denoted *NJDUM*, which receives a value of one if the bank operates in New Jersey and a value of zero if it is a Pennsylvania bank. An additional dummy variable *HQDUM*, accounts for the fact that for five of the 120 banks in the sample, data on the sex breakdown for "officials and managers" refers only to the headquarters office rather than to the bank as a whole. We also introduce into some of the regressions the dummy variable *HOLDCO*, which indicates ownership by a bank holding company. We have no predictions concerning the impact of these variables.

An important dimension along which banks may differ is the degree to which they are oriented toward the retail customer.

Since retail-oriented firms tend to provide the consumer with greater locational convenience, we attempt to capture this distinction by employing a variable indicating branches per deposits, denoted *BR/DEP,* with no predictions concerning its impact.

A measure of firm growth *GRO,* defined as the ratio of 1975 deposits to 1970 deposits of the bank, is also included. To the extent that female participation in the relevant labor market has been growing over time, more rapidly growing firms may better reflect this growing participation as a result of their greater hiring activity.

Also included in some regressions is a variable indicating firm size, measured by the number of employees of the bank (denoted *TOTEMP*). Our use of this variable may be criticized on the grounds that it may be endogenous. A discriminatory firm, as Arrow [1974] points out, pays a higher average wage for labor, adjusted for productivity difference. Since the optimal response to this discrimination-induced increment in wages paid is to reduce the number of employees (and the size of the firm), the argument suggests an inverse causal relationship running from discrimination to firm size. We nonetheless include firm size in some of the reported regressions for purposes of comparison.

Several variables that describe the local labor markets in which each bank operates are also included in the analysis.[19] These are introduced to account roughly for area differences that may proxy market wage differentials or other unspecified area-specific determinants of the employment decision. The variables we use for this purpose are the proportion of the labor market classified by the 1970 Census as rural (denoted *RURAL*), the proportion of employment in the labor market accounted for by manufacturing (denoted *MANFPROP*), and the proportion of employment accounted for by wholesale and retail trade (denoted *WRPROP*).

A final labor market variable (denoted *MGRAT*) measures the ratio of female to male officials and managers working in the labor market in which the bank operates. This variable also is designed to control for area or labor market differences that may

19. Labor market definitions are those used by the Pennsylvania and New Jersey Departments of Labor and Industry in their statistical reporting. These consist of SMSAs, counties, and in a few cases, collections of counties. Decisions on which counties may be combined to make up a labor market appear to be judgmental. In most cases these labor markets roughly coincide with our more precisely defined banking markets and are generally of equal size.

influence the employment decision of individual banks, but since it may not be purely exogenous, we report regressions both with and without this explanatory variable included.

Two additional variables to be employed indicate the degree to which firm ownership is concentrated in a few hands. Following previous studies, we employ dummy variables to distinguish between "manager-controlled" and "owner-controlled" firms. This distinction is captured by introducing into some regressions a dummy variable *OWNDUM*, which receives a value of one if an individual or family owns more than 10 percent of the firm and zero otherwise. To allow for a weaker form of owner control, we also include dummy variable *WKOWNDUM,* indicating that the largest ownership share is between 5 and 10 percent. To the extent that this type of measure is a proxy for the level of control exercised by outside owners and to the extent that divergent interests of owners and managers are important in explaining discriminatory behavior, positive coefficients of these two variables are implied, with the coefficient of *WKOWNDUM* not exceeding in magnitude the coefficient of *OWNDUM*.

All estimations are weighted to correct for heteroskedasticity. Since results reported below assume a multiplicative relationship, the nature of the heteroskedasticity may be seen by noting that the dependent variable, $\ln(L_f/L_m)$, may be rewritten as $\ln(\bar{P}_f/\bar{P}_m)$, where $\bar{P}_f$ and $\bar{P}_m$ represent the observed proportions of "officials and managers" that are female and male, respectively. Since the underlying model may be interpreted as explaining the ratio of the true probabilities of a member of this job category being female and male (P_m and P_f), respectively, it is clear that the variance of the error term will differ across observations and in general will be larger for those smaller firms having fewer managers. Zellner and Lee [1965] have shown that in the case of this "logistic" function, $\text{var}(\varepsilon) = 1/(nP_fP_m)$, where ε is the error term and n represents the number of "officials and managers" in each bank. The use of the Goldfeld-Quandt test resulted in rejection of the hypothesis of homoskedasticity in a manner consistent with this explanation. All regressions are thus weighted by $(n\bar{P}_f\bar{P}_m)^{1/2}$, as suggested by Theil [1971, p. 634].[20] Homoskedasticity could not be rejected after these corrections were made.

20. Weighting the estimation in this manner makes no material difference to the results reported below.

V. The Results

Definitions of all variables employed in the analysis are presented in Table II, along with their means and standard derivations. Table III reports regressions obtained with the full sample of 120 banks using the three-firm concentration ratio ($CR3$) as the measure of market concentration. Since, as noted above, all firms operate in the same industry, interindustry differences are not a factor. Thus, even the regression reported in column (1), which includes only market concentration as an independent variable, represents in many ways a "cleaner" test of the hypothesis than that found in previous studies. As can be seen, the coefficient is negative and statistically significant. As indicated in columns (2) through (11), the inclusion of additional explanatory variables to control for various characteristics of banks and the environments in which they operate yield negative coefficients of market concentration with even higher levels of statistical significance. Thus, our results are quite consistent with the hypothesis of a positive relationship between market concentration and discrimination. Coefficient magnitudes indicate roughly a 4 to 5 percent reduction in the ratio of female to male officials and managers with a 10 percent increase in the three-firm concentration ratio. Employing coefficient magnitudes reported in column (10) and using the mean values of explanatory variables, point estimates of the female-male employment ratios in the most concentrated and least concentrated markets in the sample are 0.33 and 0.42, respectively. Expressed in terms of the proportion of official and managerial positions occupied by females, these estimates are 25 percent and 30 percent, respectively.

The coefficients of other variables employed in these regressions are also of interest. Note first that the coefficients of *HQDUM* indicate no significant difference in the ratio of female to male officials and managers in comparing headquarters offices to banks as a whole.

The coefficients of ln(*MG/EMP*) are positive and highly significant in all regressions. As noted above, this finding is consistent with the hypothesis that jobs involving lower levels of responsibility tend to be more "female," and that as a result, the more broadly one defines the job category of "officials and managers," the higher the ratio of females to males one observes.[21]

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21. Conversations with officials at the Department of Labor suggest that they are fully aware of this problem in evaluating compliance with "affirmative action" guidelines.

TABLE II

		Mean	Standard deviations
L_f/L_m	The ratio of female to male officials and managers employed by the bank.	0.39	0.24
CR3	The local banking market three-firm concentration ratio, calculated using the market deposits of all banks that operate in the market.	0.60	0.14
MGRAT	The ratio of female to male managers in the labor market in which the bank is located.	0.18	0.03
HQDUM	Dummy variable indicating that the dependent variable is calculated only for the bank's headquarters office.	0.03	0.18
NJDUM	Dummy variable indicating a New Jersey bank (all remaining banks operate in Pennsylvania).	0.25	0.43
BR/DEP	The ratio of the number of bank branches to total deposits.	0.08	0.04
RURAL	The proportion of the geographic labor market that is rural.	0.33	0.22
GRO	Firm growth, defined as the ratio of 1975 deposits to 1970 deposits.	1.69	0.39
TOTEMP	Total employees of the bank.	456.83	806.35
MANFPROP	The ratio of manufacturing employment to total employment in the labor market in which the bank operates.	0.34	0.11
WRPROP	The ratio of wholesale and retail employment to total employment in the labor market in which each bank operates.	0.25	0.06
MG/EMP	The ratio of the number of officials and managers to the number of total employees of the bank.	0.20	0.04
HOLDCO	Dummy variable indicating that the bank is a member of a bank holding company.	0.27	0.44
OWNDUM	Dummy variable receiving the value of one if there exists at least one owner who owns more than 10 percent of the outstanding stock of the bank and a value of zero otherwise.	0.20	0.40
WKOWNDUM	Dummy variable receiving the value of one if the largest ownership share is between 5 and 10 percent and zero otherwise.	0.29	0.46
SHARE	The bank's market share.	0.15	0.13

TABLE III

THE RELATIONSHIP BETWEEN THE RATIO OF FEMALE TO MALE OFFICIALS AND MANAGERS EMPLOYED BY BANKS AND VARIOUS EXPLANATORY VARIABLES

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
CONST	-1.39	0.63	0.64	1.18	1.51	2.17	1.96	2.04	2.15	2.95	1.34
	(-11.87)	(2.03)	(2.40)	(4.07)	(3.08)	(2.70)	(2.33)	(2.33)	(2.47)	(2.84)	(4.42)
ln(CR3)	-0.41	-0.66	-0.44	-0.46	-0.50	-0.53	-0.51	-0.52	-0.45	-0.40	-0.42
	(-2.03)	(-3.72)	(-2.82)	(-3.13)	(-3.09)	(-3.24)	(-3.04)	(-3.05)	(-2.60)	(-2.23)	(-2.84)
HQDUM		0.18	-0.02	0.18	0.22	0.23	0.22	0.23	0.15	0.13	
		(0.91)	(-0.13)	(1.07)	(1.25)	(1.27)	(1.22)	(1.25)	(0.82)	(0.71)	
ln(MG/EMP)		1.36	1.36	1.24	1.23	1.21	1.25	1.25	1.24	1.23	1.24
		(6.90)	(8.02)	(7.57)	(7.35)	(7.24)	(7.25)	(7.23)	(7.23)	(7.13)	(7.73)
NJDUM			0.59	0.51	0.46	0.46	0.47	0.47	0.42	0.39	0.49
			(6.45)	(5.77)	(4.31)	(4.32)	(4.39)	(4.35)	(3.69)	(3.38)	(5.64)
ln(BR/DEP)				0.26	0.26	0.26	0.24	0.25	0.17	0.16	0.14
				(3.79)	(3.63)	(3.53)	(3.23)	(3.15)	(1.89)	(1.73)	(1.75)
ln(RURAL)					0.03	0.04	0.01	0.02	-0.01	-0.04	
					(0.56)	(0.64)	(0.17)	(0.28)	(-0.07)	(-0.41)	

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
ln(MANFPROP)				-0.03 (-0.25)	-0.01 (-0.05)	-0.01 (-0.04)	-0.00 (-0.00)	-0.05 (-0.43)	0.06 (0.41)	
ln(WRPROP)				0.23 (0.86)	0.28 (1.05)	0.23 (0.81)	0.25 (0.86)	0.20 (0.70)	0.60 (1.49)	
ln(MGRAT)					0.35 (1.04)	0.34 (0.98)	0.35 (1.01)	0.32 (0.93)	0.41 (1.15)	
ln(GRO)						0.20 (0.91)	0.19 (0.89)	0.12 (0.56)	0.11 (0.51)	
HOLDCO							0.03 (0.36)	0.07 (0.86)	0.08 (0.98)	
ln(TOTEMP)								-0.07 (-1.64)	-0.08 (-1.53)	-0.07 (-1.86)
ln(SHARE)									-0.01 (-0.22)	
$\hat{R}^2$	0.04	0.07	0.21	0.29	0.30	0.30	0.30	0.31	0.31	0.28
N	120	120	120	120	120	120	120	120	120	120

Note. Numbers in parentheses are t-statistics. $\hat{R}^2 = 1 - \Sigma(e_i - \hat{e})^2/\Sigma(y_i - \bar{y})^2$, where y_i denotes the dependent variable for observation; and e_i the residual for observation i, calculated by using coefficients from the weighted regressions in the unweighted relationship.

The highly significant and positive coefficients of *NJDUM* in regressions (3) through (11) indicate a higher ratio of female to male "officials and managers" in New Jersey banks than in Pennsylvania banks, all else equal. A possible explanation involves the difference in regulatory environments in the two states. In New Jersey, banks may branch statewide, while branching authority in Pennsylvania during the period under study was much more severely limited. If, as a result, New Jersey banks on average face a greater threat of entry from banks outside these markets, then the coefficient of *NJDUM* may reflect differences in potential competition between the two states. Since other explanations are possible, this one must be considered speculative.

The positive and significant (although sometimes marginally significant) coefficients of ln(*BR/DEP*) imply that banks which are more branch-intensive (reflecting a greater retail orientation) tend to employ a larger proportion of female "officials and managers." This result may reflect a greater representation of females in the position of branch manager or in other positions associated with branch operations.

As is indicated in regressions (5) through (7), the coefficients of ln(*RURAL*), ln(*MANFPROP*), ln(*WRPROP*), ln(*GRO*) and ln(*MGRAT*) are not significant. Neither the distinction between urban and rural banking environments nor the industrial mix of these environments, as proxied by the proportion of employment accounted for by manufacturing or wholesale and retail trade, is found here to play a significant role in explaining bank employment behavior.[22] This is also true of firm growth and the ratio of female to male "officials and managers" in the labor market in which the bank operates. While the coefficient of ln(*MGRAT*) is positive, the hypothesis that no relationship exists cannot be rejected. Restricting the coefficient of ln(*MGRAT*) to unity, so that the dependent variable measures the ratio of female to male "officials and managers" employed by the bank relative to that observed in its labor market (not reported here) makes no material difference to the results.

The coefficient of ln(*TOTEMP*), firm size measured by the number of bank employees, is negative but marginally significant at best. A negative impact of size is consistent with findings by

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22. A measure of the average wage paid by financial institutions in the labor market and a dummy variable indicating operation in an SMSA (not reported here) were also found to have insignificant coefficients and made no material difference to the results of interest in the study.

Shepard and Levine [1973], who note that female participation rates in 231 of the 250 largest U. S. industrial firms during 1966–1970 were significantly lower than the national average for officials and managers, professionals, and technicians. Greater participation in management and other higher level job categories by female family members in the case of smaller "family owned" firms is a possible explanation. Finally, note that affiliation with a bank holding company, as evidenced by the coefficient of *HOLDCO,* makes no statistically significant difference to the bank's employment of female and male "officials and managers."

Column (10) in Table III reports results obtained when the firm's market share, ln(*SHARE*), is included as an additional explanatory variable. The results suggest that however one wishes to interpret market share (as a measure of market power or relative firm efficiency), it does not play a significant role in this relationship. Column (11) in Table III reports results obtained by excluding all variables with coefficients that are not significant at even marginal levels. As may be seen, the results of interest are not materially altered.

The possibility of structural differences in the relationship between market concentration and sex discrimination as they apply to large and small banks in the sample was also investigated. Banks with as few as 50 employees are included in the analysis with banks that rank among the largest in the country, and the existence of structural differences in underlying relationships for banks so disparate in size is a clear possibility. This is particularly relevant to the role of market concentration, since the fortunes of large banks, due to greater participation in less locally oriented product lines, may be less closely tied to the structure of local banking markets. However, the hypothesis of no difference in the impact of market concentration for large and small banks could not be rejected, and re-estimation of the results in Table III excluding all banks with more than 500 employees (leaving a relatively homogeneous sample of medium-sized banks) yielded equivalent results.

In Table IV we present results obtained with a significantly smaller sample of banks that allows introduction of the distinction between manager-controlled and owner-controlled firms, as captured by the variables *OWNDUM* and *WKOWNDUM.* Columns (1) and (2) report results obtained with and without a measure of firm size included as an explanatory variable. Note that neither *OWNDUM* nor *WKOWNDUM* registers a statistically significant

TABLE IV

	(1)	(2)
CONST	1.47	1.49
	(3.69)	(3.72)
ln(CR3)	− 0.49	− 0.47
	(− 2.60)	(− 2.50)
OWNDUM	0.02	0.01
	(0.19)	(0.04)
WKOWNDUM	0.04	0.02
	(0.29)	(0.13)
ln(MG/EMP)	1.42	1.37
	(6.40)	(5.85)
NJDUM	0.64	0.60
	(4.81)	(4.11)
ln(BR/DEP)	0.26	0.22
	(3.45)	(2.06)
ln(TOTEMP)		− 0.03
		(− 0.65)
$\hat{R}^2$	0.54	0.54
N	76	76

Note. See Table III.

impact. The inclusion of terms to account for possible interactions between ownership type and market concentration (not reported here) yields similarly insignificant coefficients. Subject to the qualifications of reduced sample size and arbitrary distinctions in firm ownership, our results provide little evidence of a relationship between discrimination and the ownership structure of the firm.

To further investigate the role of market concentration and to distinguish it from the role of individual bank market share in explaining employment discrimination, we also report results of fitting a "fixed effects" model to our data. We first regress the employment variable $\ln(L_f/L_m)$ on variables for which there is within-product-market variability *and* a set of dummy variables indicating operation in *each* of the individual product markets. The coefficients of the independent variables in this first stage reflect solely variability occurring within product markets. There are two major advantages of this procedure. First, the coefficients of market share and other bank-specific variables are estimated with a perfect control for all marketwide variables, even those we have thus far been unable to measure. Second, the estimates of the dummy variable coefficients, one for each product market,

are a useful summary of the data from our analysis that may be of use to other analysts who wish to test other hypotheses designed to explain marketwide variability in the female-male employment ratio. These dummy variable coefficients and the corresponding three-firm concentration ratio are listed with the relevant product market designation in Table V. The result of the first stage regression, weighting the data as before, is

(1) $\ln(L_f/L_m) = -0.74 + 0.34 HQDUM$
$(-0.15)\quad(1.08)$

$+ 1.32 \ln(MG/EMP) + 0.20 \ln(BR/DEP) \quad -0.004GRO$
$(6.42) (1.46) (-0.01)$

$+ 0.02HOLDCO \quad -0.11 \ln(TOTEMP) + 0.04 \ln(SHARE)$
$(0.23) (-0.76) (0.30)$

$+ 0.34NJDUM \quad -2.41 \ln(MGRAT) + 0.44 \ln(RURAL)$
$(1.48) (-1.16) (0.58)$

$$+ \sum_{i}^{n-1} \beta_i MD_i, \qquad \hat{R}^2 = 0.55,$$

where MD_i is the dummy variable for banking market i, β_i is its coefficient, and n is the number of banking markets in the sample. Note that only the coefficient of $\ln(MG/EMP)$ is highly significant and that individual bank market share fails to register a statistically significant impact. Thus, with perfect control for all market differences, we cannot reject the hypothesis that bank-specific market share is unrelated to sex-based employment practices. It is also interesting to note that by conducting the appropriate F-test, we cannot reject the hypothesis that intermarket variation is fully captured by market concentration.

A second stage regression in which the market dummy coefficient estimates are regressed on the three-firm concentration ratio and other area-specific variables yields[23]

$\beta_i = 3.43 \quad -0.90 \ln(CR3) + 0.09NJDUM$
(2)$ (4.57)\ (-2.72) (0.46)$

$+ 3.14 \ln(MGRAT) \quad -0.67 \ln(RURAL), \qquad \hat{R}^2 = 0.69.$
$(6.95) (-5.22)$

23. Note that the labor market variables and the state dummy variable are included in both stages. The reason is that for some banking markets these variables account for some within-market variation (justifying their use in the first stage), while this is not true for other banking markets (justifying their use in the second stage). The inclusion or exclusion of these variables from either or both stages makes no material difference to the results concerning concentration.

TABLE V

Market name	Market dummy coefficients	Three-firm concentration ratio (CR3)	Market name	Market dummy coefficients	Three-firm concentration ratio (CR3)
Philadelphia-Camden	0.0000	0.481	Du Bois	−0.905	0.633
Reading	−0.689	0.690	Indiana	0.354	0.646
Allentown-Bethlehem	−0.985	0.473	Johnstown	0.106	0.571
Hazleton	−1.046	0.677	Uniontown	0.146	0.845
Wilkes-Barre	−0.150	0.608	Greensburg-Latrobe	−0.081	0.738
Scranton	−0.511	0.470	Pittsburg	−0.435	0.821
Lancaster	−1.227	0.536	Oil City	−1.458	0.669
Lebanon	−0.769	0.489	Erie	−1.164	0.773
York	−1.253	0.661	Sharon-Meadville	−0.626	0.564
Gettysburg-Hanover	−1.248	0.518	New Castle	−0.269	0.564
Harrisburg-Carlisle	−1.212	0.630	Washington-Waynesburg	0.031	0.675
Pottsville	−1.122	0.615	Butler	−1.770	0.949
Lewisburg-Middleburg	−0.507	0.474	Vineland	0.743	0.458
Williamsport	−1.969	0.602	Cape May	−1.332	0.776
Wellsboro-Mansfield	−0.491	0.552	Atlantic City	−0.038	0.782
Lewiston	−0.969	0.703	Toms River	−0.921	0.580
Huntingdon	−0.799	0.869	Trenton	−0.587	0.457
Chambersburg	−1.667	0.472	Asbury Park	−1.120	0.553
Altoona	−0.842	0.715	New Brunswick	0.555	0.371
Clearfield	−3.156	0.950	Newark	−0.154	0.532
Warren	−1.553	1.000	Wilmington	0.587	0.620

The significantly negative coefficient of market concentration in this regression again suggests a relationship between market concentration and discriminatory behavior.[24] These results are striking in that they suggest that all firms in the more concentrated markets in the sample were protected from competition and provide no support for the notion that only firms with large market shares (perhaps because of economies of scale) were so protected.

VI. CONCLUSION

In this paper we have examined the relationship between product market competition and employment discrimination using an especially constructed data set that links microeconomic data on female employment and indicators of market concentration in the banking industry. By using firm-specific data relating to the banking industry, it has been possible to estimate the relationship between market concentration (assumed to proxy product market competition) and the employment of women in a way that avoids the problems of interindustry differences that have troubled previous studies.

We find strong support for a negative relationship between market concentration and the firm's employment of women. The results are robust with respect to both model specification and measure of market concentration. Further, we find that we cannot reject the hypothesis that individual bank market shares are unrelated to the relative employment of women, confirming that the relationship between male-female employment ratios and market concentration in our data is due primarily to differences across markets rather than individual banks. Point estimates of the female-male employment ratios in the most concentrated and least concentrated markets in the sample, evaluated at mean values of remaining explanatory variables, are 0.33 and 0.42, respectively. Expressed in terms of the proportion of positions occupied by females, these estimates are 25 percent and 30 percent, respectively.

Whether or not these results may be generalized to apply to other industries depends on the nature of the relationship between

24. Note that the coefficients of ln(*MGRAT*) and ln(*RURAL*) are also significant. The lack of statistical significance of the coefficients of these variables in Table III results from the fact that the within-market and across-market effects, as indicated in equations (1) and (2), are opposite in sign.

market structure and firm conduct as it applies outside the banking industry. Our test rests on the presumption that firms operating in relatively concentrated markets exhibit market power. Since arguments against this market power hypothesis rest in part on the presumption of relatively easy entry by potential entrants, the banking industry, with its history of regulatory constraints on entry, could be considered a special case. Further testing of this hypothesis as it applies to other industries should be a high priority for further research.

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