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An Application of a New Equal Employment Opportunity Index

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Abstract: This paper introduces and proposes a policy application for a new Equal Employment Opportunity (EEO) Index. The index is comprised of multiple measures of employers' human resource management outcomes and is designed to reflect employers' systemic EEO efforts. The index is applied to industry data from the Current Population Survey, and the tenets of Total Quality Management (TQM) theory are used for interpretation of results. It is found that the mining/construction industry provides a relatively inhospitable climate for women in the form, primarily, of a high degree of gender-related occupational segregation. The financial industry demonstrated the overall greatest gains for women during the 1990s. Closer examination of these industries with very good and very poor outcomes highlights the importance of addressing "special causes" of industry performance on the index.

JEL classification: J71, J78, J31, M11

Key words: discrimination, Total Quality Management, glass ceiling, occupational segregation, gender wage differentials

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Which Industries are the Best Employers for Women?
An Application of a New Equal Employment Opportunity Index

The purpose of this paper is to demonstrate how policy makers can make use of a new Equal Employment Opportunity (EEO) Index to evaluate various industries' employment environments for women. An industry application of the EEO Index identifies gender disparities in employment outcomes across industries. Firms operating in poorly-performing industries might be slated for greater enforcement efforts by agencies such as the Equal Employment Opportunity Commission (EEOC) and the Office of Federal Contract Compliance Programs (OFCCP). In addition, policy makers may choose to direct training and other assistance to poorly-performing industry groups to assist them in improving their EEO performance.

The impetus behind the use of a single index to measure and compare the experience of female workers is multi-faceted. First, a comprehensive index permits assessment of systemic employment discrimination. Employers' human resource management activities (e.g., compensation, recruitment, and evaluation of workers) are inter-related systems that should be designed and evaluated together (Becker, Huselid, and Ulrich 2001). This suggests that pay, hiring, and promotion outcomes should also be assessed together. The EEO Index in this paper allows distinct human resource management activities to be evaluated as a system. Relatedly, race and gender employment discrimination often go hand-in-hand, and the EEO Index provides a means to consider the systemic employment experience across multiple groups.

Second, summarizing an employer's EEO performance in a single index provides a common measure with which to compare the performance of different employers and industries, and it allows quantification and tracing of EEO progress over time. This search for a common index that describes the overall employment experience from the perspective of women and/or

minorities is similar to the long-standing search by development economists for a single index to quantify, compare, and trace over time the social development of a country.[1]

Third, the single EEO Index used in this paper serves as a more reliable and valid indicator of women's work experiences than previously available because it is rooted firmly in anti-discrimination laws such as Title VII of the Civil Rights Act of 1964, which prohibits discrimination in any employment decision. There are no other existing measures that capture women's work experiences so systematically, or that provide such meaningful benchmarks such as the EEO performance of other industries or EEO performance over time.

Variation in the EEO Index across industries will be interpreted within the framework of Total Quality Management (TQM) (Latzko and Sanders, 1995). In part, theories of TQM suggest that there will exist some random or common variation in industries' EEO performances that occur as part of the economic system in which they operate, and there will exist some assignable or special causes of variation that are attributable to particular industries (Stevenson, 2002, chs. 9-11). Since both types of variation affect system performance, the most likely effective strategy for improving EEO outcomes (i.e., improve the employment outcomes for women) is to implement two types of interventions: a) generalized interventions across the economy (e.g., across industries), and b) interventions that address only the very high or very low performance of individual industries. The EEO Index employed in this paper will be used in the second type of intervention, by serving as a tool for identifying outlier industries The paper begins with a discussion of what factors generally denote "good" employers or industries for women, and why the EEO Index represents a preferred assessment tool. An introduction of the principles of TQM and discussion of how these principles can assist policy makers and

[1] For example, see Cahill and Sanchez (2001).

enforcement agencies in using the index follows. Next the EEO Index and its components are introduced, followed by a description of the Current Population Survey (CPS) data used to demonstrate the utility of the index. Application of the index is offered along with closer scrutiny of the findings for outlier industries. Finally, the implications of the findings is discussed, with a focus on how policy makers and enforcement agencies can best utilize the EEO Index.

The "Best" Employment Environments for Women

There have been a number of efforts in the popular press to identify the best employers for women (e.g., *Fortune*, 2003, *Working Mother* 2002). Governmental agencies, such as the Equal Employment Opportunity Commission (EEOC) and the Office of Federal Contract Compliance (OFCCP), also provide awards to employers excelling in their diversity efforts. Employers likely welcome these forms of recognition because they signal the most desirable work cultures, human resource practices, and development opportunities, which aids in the attraction and retention of valuable employees (Cable and Graham, 2000). In turn, job seekers and employees rely on these reports and awards to choose employers (Rynes and Cable, 2003).

Unfortunately, measures of "best" employers, and in particular "best employers for women" appear flawed. Most ranking criteria heavily consider employer efforts in the EEO area. The EEO Index proposed in this paper considers actual employment outcomes such as the pay, hiring, job placement, promotion, and retention of women employees. These outcomes reflect the success or failure of employer efforts. In addition, government enforcement efforts tend to exclude pay data, and fail to recognize the inter-relatedness of employers' various human resource management practices. The EEO Index has components that recognize each human

resource management activity, and it can be applied at the level of the business unit, employer, and/or industry.

Graham and Hotchkiss (forthcoming) describe how U.S. public policy makers could address gender disparities in employment by assessing employer EEO performance relative to other firms in the same industry. Since policy makers aim to address gender disparities in employment across the entire economy, they should also consider assessing EEO performance by industry. This is because the sources of gender disparities may vary by industry, necessitating multiple forms of assistance or intervention. For example, the form of gender disparities in the mining and construction industry, of which women comprise only 10 percent of the workers, may be quite different than the gender issues in the financial industry, of which women comprise 64 percent. Industry performance on the EEO Index provides potentially critical information for policy makers because the index identifies which industries have the greatest gender disparities and therefore which industries need the most improvement. In addition, the index can be used to identify industries with flat or worsening gender-related EEO performances.

The EEO Index

The EEO Index, developed in Graham and Hotchkiss (forthcoming), combines components of differential treatment of men and women in the workplace. The five components of the index are as follows:

1) The "Equal Pay Component" measures the extent to which the employer pays women and men in the same jobs the same pay. This will be indicated by the existence of a negative and significant gender coefficient in a regression of hourly earnings on employees' gender, race, job characteristics, and human capital characteristics. The wage regression will also control

for self-selection into the labor market.[2] The coefficient on the female dummy variable is what represents the selectivity-corrected percentage wage differential. This component of the index is designed to capture equal pay discrimination within employers and is designed to encourage employers to use consistent pay-setting practices and monitor any gender-related pay differences that can not be justified by merit, seniority, or any factor other than sex. At present, the Equal Employment Opportunity Commission (EEOC) receives relatively few equal pay complaints, in part because few employees have access to the pay information of their co-workers.[3]

2) The "Occupational Segregation Component" measures the extent to which an employer's workforce is integrated, by gender, across jobs and occupations. This will be measured by the well-known Duncan dissimilarity index (Duncan and Duncan 1955). The Duncan Index falls between zero and one and indicates the percent of either men or women that would have to change occupations in order for the distributions across occupations to be equal. The closer the index is to zero, the more equal are the distributions of men and women across occupations.[4] It is calculated as:

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[2] See Heckman (1979) and Greene (1981). This essentially amounts to a two-step procedure. In the first step, an estimate of each worker's probability of being observed in the labor market is calculated. This probability is included as a regressor in the second step estimation of the wage equation.

[3] U.S. EEOC, "Charge Statistics from the U.S. EEOC FY 1992 through FY 2000," <http://www.eeoc.gov/stats/charges.html>. For the years 1992 through 2000, Equal Pay Act charges constituted less than 2% of individual charge filings with the EEOC.

[4] It is possible to score poorly on Occupational Segregation by reverse occupational segmentation (e.g., if men are over-represented in a traditionally-female occupation); however, these situations would be relatively rare, and likely would have to be analyzed by the EEOC on a case by case basis.

$$\text{Occupational Segregation}_j = \frac{1}{2}\sum_{i=1}^{n}|M_{ij} - F_{ij}|,$$

where n is the number of occupations represented in industry j, M_{ij} is the proportion of men employed by industry j found in occupation i, and F_{ij} is the proportion of women employed by industry j found in occupation i. Because women usually work in lower-paying occupations, this component is designed to capture excessive and potentially discriminatory occupational segregation, within employers. Thus employers are encouraged to examine their job placement processes, as well as consider the implementation of programs to train and encourage women to enter non-traditional fields (e.g., computer programming).

3) The "Glass Ceiling Component" measures the extent to which women are represented in the upper levels of the organization. This will be measured as 1 minus the proportion of managerial and professional positions that are held by women in the industry. Attention to this component is designed to encourage employers to eradicate hiring and promotion discrimination, as well as institute programs to encourage and assist women in reaching the upper levels of organizations.

4) The "Hiring Component" measures the extent to which women and men are proportionally represented in occupations and firms relative to their levels of availability in the relevant labor market.[5] This measure is simply the proportion of occupations represented in each

[5] Definition of the "relevant labor market" will depend on the level of analysis. Analysis at the firm level might suggest that the relevant labor market contains other firms in that industry. Analysis at the industry level (as in this paper), the relevant labor market becomes the entire labor market.

firm in which women are under-represented relative to the relevant labor market.[6] For example, if only 25 percent of occupation A is made up of women in an industry, whereas market-wide, 60 percent of that occupation is made up of women, then women are considered under-represented in that occupation in that industry. If women are under-represented in 25 percent of all occupations in an industry, then the industry's Hiring Component would be equal to 0.25. Attention to this component will encourage employers to devote attention to their recruitment and selection practices to ensure that they do not result in hiring discrimination.

5) The "Related Discrimination Component" considers the scores on the separate components from the perspective of race/ethnicity.[7] This component is comprised of the outcome measures on the first four components across racial/ethnic lines. This component is designed to recognize the potential interconnectedness of race, gender, and other types of discrimination, and the potential for employers who are discriminatory in one area (e.g., gender) to be discriminatory in other areas. Supporting this approach, there is a large literature on the inter-relatedness of gender and race, and how being a woman and a member of an racial or ethnic minority group could result in greater levels of discrimination.[8]

Performance on the five components are combined into a single index for assessment purposes. A key issue in constructing an index is the way in which the five components are

[6] This component could be modified to consider the degree of under-representation in hiring for each occupation.

[7] Additional related components can be added for other protected groups, such as the disabled.

combined into a single number. The method chosen here is simply the calculation of the arithmetic mean. The arithmetic mean index for industry *j* is given by:

$$I_{Aj} = \frac{1}{5}\sum_{i=1}^{5} C_{ij},$$

where C_i is the *i*th component for industry *j*. The advantage of the arithmetic mean is that it is a well-known statistic representing a linear average of each of the components. Since all components of the index are measured on a scale between 0 and 1, the arithmetic mean seems a reasonable choice. A disadvantage is that each component is equally weighted and that extremely poor performance in one are can be exactly offset by extremely good performance in another area.[9] Of course different weights can be applied to the different components as might be deemed necessary by past poor performance in one area or by a particular policy emphasis of the evaluator.

Total Quality Management Principles

To most effectively use EEO Index results to improve the economic system's hospitability to women workers, we draw upon the principles of Total Quality Management (TQM), a widely-used management philosophy that advocates continuous improvement to production systems to ensure high levels of product quality and cost efficiencies (Stevenson, 2002). A key principle of TQM is the analysis of variation in production processes (Hackman

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[8] For example, see Spelman (1988) and Chavetz (1997).

[9] A potential alternative is the geometric mean, given by $I_{Gi}=[P_{(j=1,5)}C_{ij}]^{1/5}$. The advantage of the geometric mean is that it registers a change or difference in each of the components as a percentage change, rather than a unit change. The disadvantage is that it weights extreme components most heavily (with the extreme case being a zero on any one component driving the

and Wageman, 1995). There are two sources of variation that can lead to poor quality and inefficiencies: special causes (e.g., an employee who does not have the education necessary to do the job) and common causes (e.g., low quality raw materials) (Latzko and Sanders, 1995). TQM theorists argue that special causes must be addressed first in order to stabilize the system, enhance the predictability of system outputs and hence, business planning processes (Hackman and Wageman, 1995; Latzko and Sanders, 1995). Outlier status, or performance that falls substantially outside acceptable levels of performance, is the primary way in which these special sources of variation are identified and targeted for elimination (Latzko and Sanders, 1995). In the case of employees, those who are far above performance norms of the group (i.e., positive outliers) should be studied to see if the special cause of their performance can be replicated. For employees far below performance norms (i.e., negative outliers), some disciplinary or performance management action likely should be taken (Latzko and Sanders, 1995).

TQM principles have much to offer regarding the measurement and improvement of employers' EEO performances. The economic system is analogous to a production system, in that employers operate within its constraints, including the industries in which they are located. Extrapolating TQM principles to this context, industries' EEO performances are due partly to the differential efforts of particular industries (or a highly unusual occurrence in a particular industry). In other words, some industries perform either extremely well or extremely poorly in the EEO area because of special or unique efforts of individual firms in these industries. TQM principles also suggest that a key first step for policymakers is to stabilize the EEO compliance system by addressing these outlier industries. Intervention in industries that are not outliers is likely to be counterproductive to system-wide EEO improvement because variation among these

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index to zero). See Moore (1996) for an application and discussion of the geometric mean as an

industries is attributable to random economic system variation rather than firms' efforts (Latzko and Saunders, 1995; Stevenson, 2002).

The EEO Index can serve as a tool for distinguishing outlier and non-outlier industries in the EEO area for purposes of appropriate policymaking intervention. To illustrate, industries' EEO performances are evaluated based on a one-standard deviation distance from the market average. One standard deviation boundaries, then, define the market "norm." Industries performing worse than one standard deviation below the average are considered poor performers. Industries performing one standard deviation above market norms would be considered good performers. All industries within market norms would be considered to be exhibiting normal EEO performance. There is clearly the question about the standard to which firms should be held, but fortunately, usefulness of the EEO Index is not dependent on any one standard. Standards could be tightened (e.g., to 0.75 standard deviation from market norms) or loosened (e.g., 1.5 standard deviations from market norms), depending upon policy judgments, evidence from the field, or statistical simulations (Stevenson, 2002).

The Data

The data used to construct this index for industries across time is the combined outgoing rotation groups from the March, April, May, and June Current Population Surveys. Samples from each month were matched to the March file in order to obtain important determinants of labor market participation (used in the estimation of wage outcomes). These months are combined in order to obtain as large a sample of workers in each industry as possible.

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index.

The index is constructed for each industry for each year from 1989 to 2000. This allows comparison across industries and an evaluation of how each industry is performing over time. Each industry is comprised of multiple employers producing similar goods or services, and therefore, are experiencing similar business and environmental pressures. Six broad industry groups are analyzed: manufacturing (MAN); mining and construction (MC); transportation, communication, and utilities (TCU); retail and wholesale trade (TRD); service (SRV); and finance, insurance, and real estate (FIN).[10] Table 1 contains some means across industries for the year 2000. In 2000, SRV, TRD, and MAN are the industries employing the greatest percentages of workers. The representation of women is lowest in the MC industry and highest in the FIN and SRV industries. The most highly unionized industries include TCU, MAN, and MC. Hourly pay rates are lowest in the TRD industry and highest in the FIN industry, with hours of work per week being longest in the MAN and TCU industries.

[Table 1 here]

Results and Discussion

Cross-sectional Comparison

Table 2 presents the EEO Index components and results for each industry in the year 2000. The component values themselves are reported along with their standardized values (in bold). The standardized values allow one to see immediately if performance on any one component is one standard deviation worse or better than the market average.[11] Any value lower

[10] Due to the small size of the agriculture industry and the unique features of the public sector, the Agriculture and Public Administration industries are excluded from the present analysis.

[11] The standardized score is calculated as the market average for that component minus the

than -1 means the industry is performing worse than one standard deviation from the market average, and any value greater than +1 means the industry is performing better than one standard deviation of the market average. The overall index is also standardized in the same way.

[Table 2 here]

With regard to the Equal Pay Component, FIN is performing below the market norm with a 25 percent pay gap between men and women in the same jobs, relative to the market norm of 22 percent. SRV is performing above the market norm with only a 19 percent equal pay gap. The worst performing industry in terms of gender-related occupational segregation is mining and construction (MC) with almost 70% of workers in that industry needing to change jobs to equalize the occupational distribution of men and women. No industry distinguished itself on this component (i.e., no industry's performance was 1 standard deviation above market norm). MC also does not perform well in the Glass Ceiling Component, with 75 percent of the women in that industry at levels below that of managerial and professional, relative to the market norm of 59 percent; SRV and FIN perform slightly above the market norm in this category. In terms of hiring, TCU performs below and SRV performs above market norms; women are underrepresented in all of TCU's occupations, while in SRV, women are underrepresented in only 20% of occupations. Finally, in the related discrimination component, which for this illustration captures EEO performance on race and ethnicity, FIN and SRV performed above market norms, and MC performed at approximately one standard deviation less than the norm.

All five components combine to produce an overall index for each industry reported in the last row of Table 2. Both the MAN and TRD industries performed within one standard deviation of the market average on all components, resulting in index values that also fall within

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industry's score on that component, divided by the market standard deviation for that component.

market norms.[12] The SRV industry performed above market norms in all but one component, resulting in an index for that industry that is farthest above the market norm overall. The FIN industry is overall slightly above the market norm, with poor performance in Equal Pay being offset by good performance on the Glass Ceiling and Related Discrimination components. Both MC and TCU have indexes below the market norm. MC's poor index was driven by its significantly below average performance on three out of the five components. The poor performance by TCU on the Hiring Component was enough to push that industry slightly outside the market norm.

Policy makers and enforcement agencies can rely on the EEO Index and its components as a valid decision-making tool for targeting industry assistance and enforcement actions. Based on the principles of TQM, industry performance outside market norms on the EEO Index highlights special sources of performance variation that need further examination (Latzko and Sanders, 1995). Thus, based on the index results in Table 2, policy makers should focus attention on the MC industry. Further studying poorly performing industries such as MC is necessary to develop effective assistance and intervention strategies. It is also important to learn from and replicate the practices of industries performing above market norms on the EEO Index (i.e., SRV). Tables 3 and 4 represent initial efforts at further investigating these outlier industries.

In the case of MC, EEO Index results point to occupational segregation (with a standardized component value of -1.751) as a problem area. Table 3 presents occupational data for women and men within the MC industry. From this table, policy makers and enforcement agencies could explore why the technicians and administrative support occupations are heavily

[12] Graham and Hotchkiss (forthcoming) demonstrate how a firm may be performing within market norms on all components of the EEO Index, yet overall be performing below the market

concentrated with women and production craft and repair positions are primarily filled by men, and target interventions to these causes. Additionally, even though a greater percentage of women than men find themselves in the professional and managerial occupations, the poor performance of MC on the Glass Ceiling Component of the index (with a standardized component value of -1.123) indicates that women still make up a small percentage of managers and professionals in this industry (only 25% of the workers in this occupational category are women). In other words, MC's problem takes the form of occupational segmentation, or gender-related job placement, within the industry. TQM principles suggest that enforcement actions and assistive interventions be stepped up in this industry.

[Table 3 here]

In contrast to MC, the service industry (SRV) performed far above market norms in 2000 according to the EEO Index. Because this result implies special sources of variation, it deserves examination in greater detail. The service industry exceeded market norms on the Equal Pay component (with a standardized value of that component of 1.157); however, it is notable women were still paid 19% less than men in the same jobs in this industry.[13] SRV performed well on the Glass Ceiling component (with a standardized value of 1.185) with approximately 59% of top management being women. And as mentioned earlier, SRV far exceeded market norms in terms of hiring women across occupations (the standardized value for the Hiring Component was 1.414).[14] Its performance on the Hiring Component, detailed in Table 4, suggests that SRV's

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norm.

[13] Recall that the wage differential is estimated by wage regressions that control for as many human capital and other job characteristics as possible and controlled for an individual's selection into the labor market.

[14] Taken together, the results from TCU and SRV on this component are consistent with theories

recruitment and retention policies may be superior to those of other industries. The numbers in Table 4 suggest that not only are women highly represented in traditional female occupations (administerial support), but they are also highly represented in the higher-paying occupations (managers and professionals). One could infer from results on the Glass Ceiling component that SRV's promotion opportunities are more open to women, or that its training and development opportunities are provided more readily to women, than in other industries. And it is possible that SRV uses more formalized pay systems or monitors pay outcomes in order to minimize unequal pay for equal work situations. While the components suggest sources of special variation, additional study and follow-up would be needed to identify which are most important. It is also possible that good EEO performance may be the result of an industry-wide culture that values diversity. In any case, employers in other industries could learn from all of these special efforts of the SRV industry, once they are understood fully.

[Table 4 here]

SRV's overall high performance might come as somewhat of a surprise, given that the service industry is relatively low-paying. These observations highlight a couple potential drawbacks of the EEO Index. First, the index does not necessarily capture how lucrative a particular industry might be for women. For example, perhaps it would be economically more beneficial for women to overlook a larger within-job pay difference between women and men in FIN in exchange for the overall higher pay of the FIN industry, yet the index ranks FIN's overall EEO performance lower than that of SRV. Second, as suggested in Graham and Hotchkiss (forthcoming), it may make more sense to have the standard for the equal pay component be zero

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of crowding (Bergmann, 1974) which posit that because some industries are less willing to hire women (e.g., TCU), women become disproportionately represented in industries with fewer barriers, such as SRV.

(i.e., no difference in pay between women and men in same jobs is acceptable, consistent with the Equal Pay Act) rather than the market norm. Using this standard (of, basically, zero tolerance), all industries would have performed far below standard on the Equal Pay component.

Performance Over Time

Practitioners of TQM recognize the benefits of examining performance variation over time (Stevenson, 2002), and the EEO Index can also be mapped over time to illustrate trends in industries' EEO performances. Figure 1 plots each industry's annual standardized index for the years 1989-2000. The bold reference line at +1 and -1 mark the industry norm boundaries (zero represents the market average). The numbers in parentheses correspond to the estimated trend coefficient for each industry and the t-value on that estimate.

[Figure 1 here]

The MAN and TRD industries are fairly steady performers, right at the market average over the entire time period. MC has fallen consistently below the market norm, but has shown some statistically insignificant improvement in recent years. While consistently above the market norm, the SRV industry has shown a slight, steady decline over the time period. FIN is an example of an industry that has improved its performance over the period, falling above the market norm in the most recent two years. Fitting a trend line through each of these standardized indexes over time, we find that TRD is showing a slightly significant (at the 90% confidence level) downward trend in performance, and SRV is showing a smaller, but more significant (at the 95% confidence level) trend downward. TCU, while falling only slightly below the market norm in 2000, should be watched closely since it seems to be on the decline, although this decline is not significant to date. FIN is demonstrating a significant (at the 99% confidence level) upward trend in performance.

These longitudinal results are consistent with the cross-sectional findings for the most part, but they provide important additional information regarding industry performances. The longitudinal results suggest that there may be special causes of the variation in FIN's EEO performance over time, and so the components of FIN's performance over time warrants detailed examination. Figure 2 plots the standardized EEO Index components for the FIN industry over time. While there is no significant trend in the Equal Pay, Occupational Segregation, or Related Discrimination components, there are statistically significant upward trends (relative to the market average) in the Glass Ceiling and Hiring components. In other words, women have been making in-roads to the managerial and professional occupations and becoming better represented across all occupational categories in the FIN industry over time. It is progress in these areas that seem to be driving the overall improved performance of the FIN industry relative to others. Despite the fact that FIN's equal pay component suffered a sharp decline between 1999 and 2000 (perhaps an anomaly that will show up as an outlier when more data are available), the overall trend for this component was not significant. In short, the good performance of FIN on both the cross-sectional and longitudinal analyses suggests that replication of FIN's best practices may be more beneficial to other industries than those of SRV. This is because the significant negative trend over time in SRV's EEO performance suggests caution in using SRV as a model for other industries based solely upon its results in 2000.

Concluding Remarks

The research in this paper shows that some industries perform much better than others in providing equal employment opportunities for women, but that the sources of good and poor performance differ across industries. The paper demonstrates how the EEO Index can be used to identify the sources of problem areas within industries. In 2000, the year of the cross-sectional

data analysis, the mining/construction industry appeared to offer the most in-hospitable climate for women and the service industry the most hospitable in terms of equal pay, occupational distribution, occupational representation, and advancement. Most industries have remained constant in terms of their treatment of women since 1989, with the exception of the financial industry, which has improved its performance over time. This finding, combined with this industry's relatively good performance on the index, suggests that the financial services industry provides a relatively hospitable climate for working women.

The analysis also demonstrates the usefulness of a single index to quantify an industry's EEO environment. That is, industries operating outside of market norms may require intervention and assistance. As seen in this paper, results on each of the index's components, and simple follow-up examination, can provide important multi-dimensional information about an industry's employment environment; information that represents a marked improvement over popular "best employer" lists and the current assessment techniques of the EEOC and OFCCP. The index can also guide industries and policy makers in ways to improve the employment environment for women. In addition to recognizing the inter-relatedness of employer human resource management practices (Becker et al., 2001), the EEO Index is also resource efficient in the sense that it permits identification of problem industries and provides information on the nature of the EEO issues involved.

Total Quality Management (TQM) principles can be used to guide policy and enforcement efforts by distinguishing between special and common sources of variation in EEO performance at the industry level. The EEO Index focuses policymakers and enforcement agencies on the human resource management activities of firms in industries with very poor EEO track records. At present, policymakers struggle to address a persistent gender earnings gap (Graham, Hotchkiss, and Gerhart, 2000). And the EEOC enforces EEO laws primarily through a

complaint-based system, and it does not systematically evaluate the staffing data it routinely collects from employers with more than 100 employees; the OFCCP monitors employers who are federal contractors somewhat more closely (Graham and Hotchkiss, forthcoming). A more routine assessment of industry EEO performance using the EEO Index and the principles of TQM likely has a greater chance of improving economy-wide employment disparities between women and men than current efforts. While some expansion of the government's data collection and processing capabilities would be required, the comprehensive EEO Index illustrated here can be implemented today to compare and track industries using publicly available data sources.

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Table 1. Sample means for the year 2000.

	Full Sample	FIN	MC	MAN	SRV	TCU	TRD
Proportion of all workers	1.00	0.08	0.08	0.20	0.35	0.08	0.22
Proportion female	0.48	0.64	0.10	0.35	0.64	0.28	0.50
Wage/hr	$15.78 (10.39)	$18.43 (12.38)	$16.65 (9.69)	$16.79 (9.67)	$15.72 (10.80)	$17.93 (11.38)	$12.75 (8.55)
Hours/wk	40.24 (9.62)	40.81 (8.29)	42.06 (8.71)	42.11 (6.67)	38.60 (10.81)	42.10 (9.90)	39.50 (10.13)
Nonwhite	0.15	0.14	0.09	0.14	0.18	0.17	0.14
College	0.19	0.31	0.08	0.16	0.23	0.17	0.14
Union	0.09	0.01	0.17	0.15	0.06	0.26	0.05
PRF occ	0.28	0.36	0.14	0.24	0.43	0.21	0.12
TCH occ	0.31	0.59	0.07	0.17	0.25	0.28	0.51
SRV occ	0.12	0.03	0.003	0.01	0.23	0.03	0.17
CRF occ	0.13	0.02	0.56	0.19	0.05	0.16	0.07
LBR occ	0.16	0.004	0.23	0.39	0.04	0.32	0.12
No. of Obs.	33,662	2,692	2,540	6,862	11,671	2,640	7,257

Notes: Standard errors in parentheses. Industry and occupation acronyms are defined as follows. MAN: manufacturing; MC: mining and construction; TCU: transportation, communications, and utilities; TRD: wholesale and retail trade; FIN: finance, insurance, and real estate; and SRV: services. PRF: professional, administrative, and managerial; TCH: technical and related support; SRV: service; CRF: precision production, craft, and repair; and LBR: handlers, equipment cleaners, helpers, and laborers.

Table 2. Industry EEO index and standardized EEO indexes for the year 2000.

Industry	FIN	MC	MAN	SRV	TCU	TRD	Market Average (std dev)
Equal Pay Component	0.2487	0.1998	0.2340	0.1938	0.2347	0.2070	0.2197
Percentage wage differential between men and women within the firm, controlling for measures of productivity.	**-1.298**	**0.8876**	**-0.641**	**1.1572**	**-0.673**	**0.568**	(0.0224)
Occupational Segregation Component	0.1743	0.6966	0.1657	0.2619	0.4609	0.2280	0.3312
Proportion of women or men who would have to change jobs in order to equalize occupational distributions.	**0.752**	**-1.751**	**0.793**	**0.3323**	**-0.621**	**0.4947**	(0.2087)
Glass Ceiling Component	0.4252	0.7545	0.6876	0.4118	0.7027	0.5448	0.5878
One minus the proportion of top management team that is comprised of women.	**1.095**	**-1.123**	**-0.672**	**1.1852**	**-0.774**	**0.2894**	(0.1485)
Hiring Component	0.4000	0.6000	0.6000	0.2000	1.0000	0.8000	0.6000
Percent of occupations within the firm in which women are under-represented.	**0.707**	**0**	**0**	**1.4142**	**-1.414**	**-0.707**	(0.2828)
Related Discrimination Component	0.2440	0.4864	0.4450	0.2633	0.3492	0.4654	0.3755
Race/ethnic sub-index	**1.230**	**-1.05**	**-0.657**	**1.0627**	**0.2495**	**-0.851**	(0.1056)
Overall Industry Index	0.2984	0.5275	0.4065	0.2595	0.5162	0.4224	0.4028
(Arithmetic Mean)	**1.047**	**-1.109**	**-0.032**	**1.2753**	**-1.008**	**-0.174**	(0.1124)

Note: The values in bold type correspond to the standardized value of the component. The standardized score is calculated as the market average for that component minus the industry's score on that component, divided by the market standard deviation for that component.

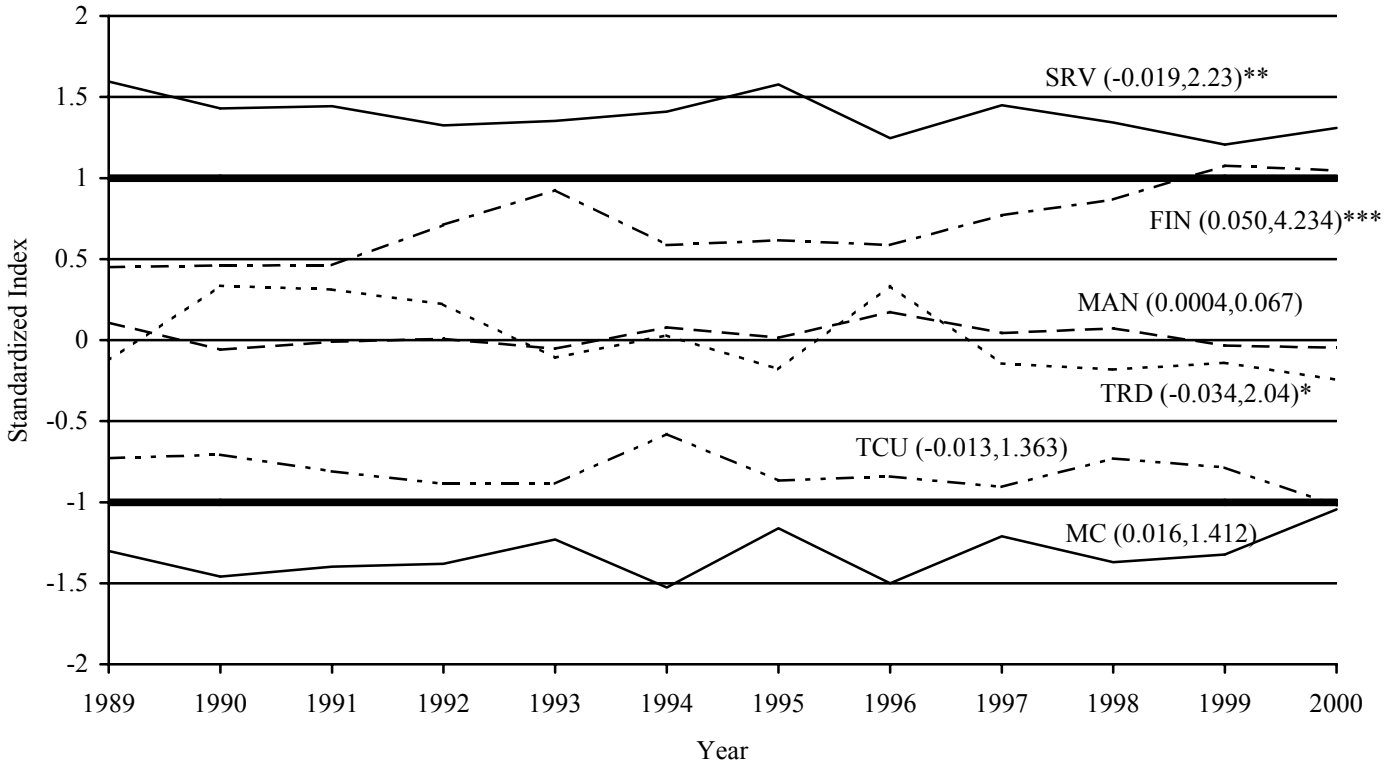
Table 3. Occupational Distribution of Men and Women in the MC Industry for the year 2000.

Occupational Category	Percent of Women in Occupation	Percent of Men in Occupation
Executive, administrative, managerial, and professional specialty	34%	13%
Technicians and related support, sales, and administrative support	47%	2%
Private Household service, protective service, other service	2%	0.1%
Precision production, craft, and repair	9%	62%
Machine operators, assemblers, inspectors, transportation and material moving, handlers, equipment cleaners, helpers, and laborers	8%	23%
Total	100%	100%

Table 4. Occupational representation of women in the SRV industry relative to the market average for the year 2000.

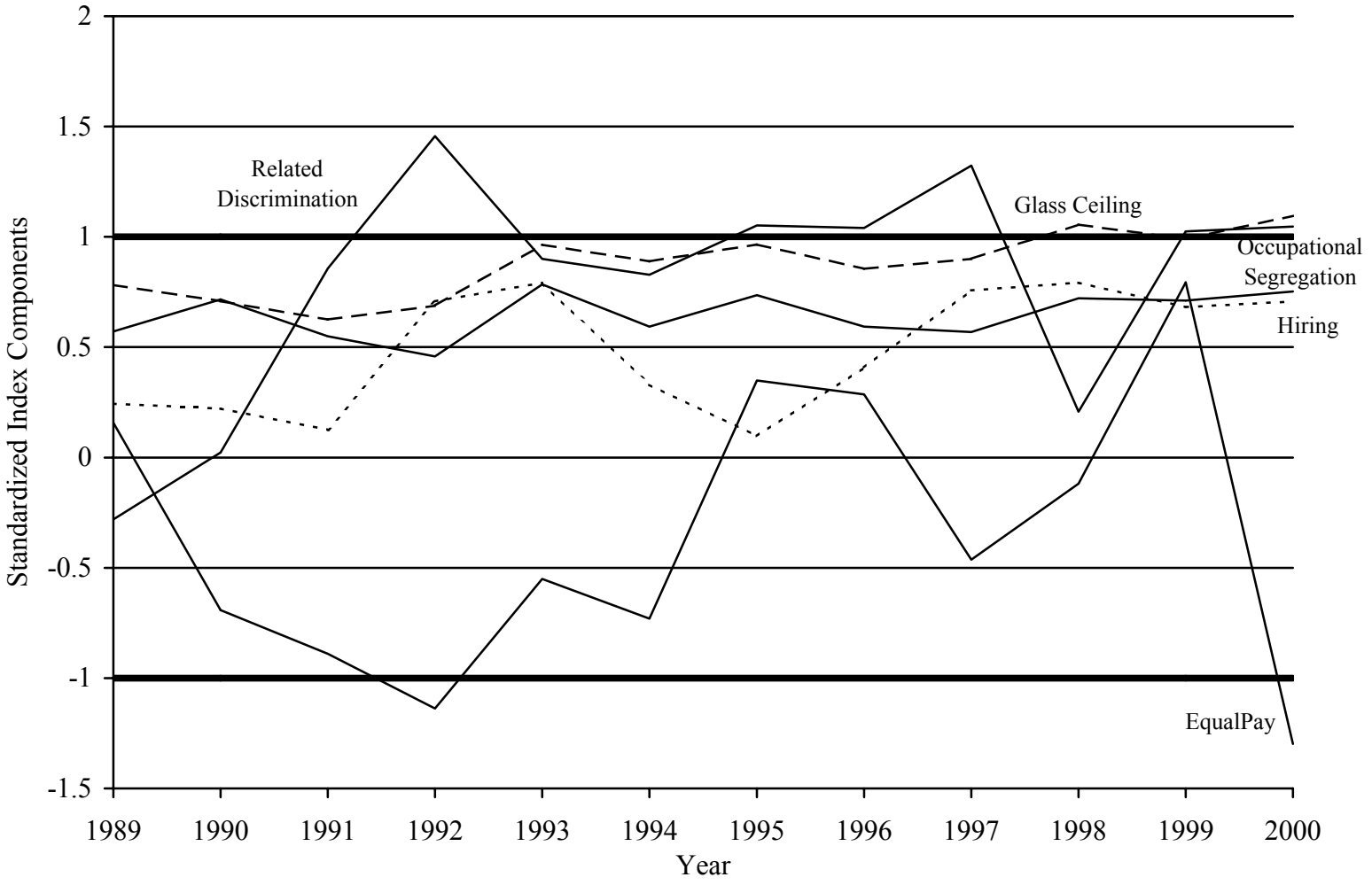
Occupational Category	Percent of Women in Occupation	
	Labor Market Average	SRV Industry
Executive, administrative, managerial, and professional specialty	50%	59%
Technicians and related support, sales, and administrative support	65%	79%
Private Household service, protective service, other service	67%	73%
Precision production, craft, and repair	10%	8%
Machine operators, assemblers, inspectors, transportation and material moving, handlers, equipment cleaners, helpers, and laborers	25%	31%

Figure 1. Standardized index for all industries over time.



Note: The bold reference line at zero marks the standardized market average each year and the boundaries of +1 and -1 delineate the market "norm." Estimated trend coefficients and t-statistics for each industry are in parentheses along with their significance level indicated. * => significant at the 90% confidence level, ** => significant at the 95% confidence level, and *** => significant at the 99% confidence level.

Figure 2. Standardized components for the FIN industry over time.



Note: The bold reference line at zero marks the standardized market average for each component for each year and the boundaries of +1 and -1 delineate the market "norm."