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LEGAL ISSUES AND STATISTICAL APPROACHES TO REVERSE PAY DISCRIMINATION IN HIGHER EDUCATION

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There have been numerous lawsuits within higher education brought by females over pay inequity and many articles have been written on the topic. Although not as prevalent, there have been some recent instances where male faculty have claimed—with some degree of success—that the process used by their institutions to make salary adjustments for females was unfair and led to reverse pay discrimination. In this paper, we examine some of the legal issues and statistical approaches surrounding claims of reverse sex discrimination in pay in the field of higher education. We begin by reviewing the way in which legal cases examine sex discrimination in pay in academe and the different approaches that institutions can take to remove pay disparities for women. We show that across-the-board salary adjustments for women are less likely than individualized salary adjustments to raise concerns about the salary determination process and possibly reverse discrimination, and lead to lower costs to the institution. These differences arise regardless of the salary model specification used by an institution when making salary adjustments. Finally, we use a model developed by the plaintiffs in a salary equity study at one institution to demonstrate the effects of using different adjustment methods on the total cost to the institution when making salary equity adjustments for both genders.

KEY WORDS: reverse discrimination; salary adjustments; gender equity.

INTRODUCTION

Beginning in the mid-1960s, the idea of equal pay for equal work received much attention in labor markets across the country. Countless

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studies have documented the fact that on average female workers tend to be paid less than their male counterparts, even after controlling for differences in their personal characteristics such as experience and education that may also affect their pay (Hearn, 1999). The field of higher education has not been immune to this issue. As documented by Ransom and Megdal (1993), Toutkoushian (1994), Barbezat (2002), Becker and Toutkoushian (2003) and others, a number of institutions of higher education have conducted studies to measure the pay disparity between male and female faculty on their campus. Many of these studies were initiated as a result of legal action filed against the institution on behalf of female faculty. In these cases, plaintiffs looked to the Equal Pay Act of 1963 and Title VII of the Civil Rights Act of 1964 to rectify work situations when they felt that female faculty were being treated unfairly relative to male faculty in terms of their compensation (Freed and Polsby, 1984, p. 1078).[1]

There have been numerous lawsuits within higher education brought by females over pay inequity (see, for example, *Cullen v. Indiana University Board of Trustees*, 2003; *Pepper v. Miami University*, 2003; *Ramelow v. Board of Trustees of the University of Louisiana System*, 2004; *Stanley v. University of Southern California*, 1994) and many articles have been written on the topic (see Perez-Arrieta, 2005; West, 2000, 1994; Ransom and Megdal, 1993; Barbezat, 2002). Institutions that have tried to rectify salary disparities for women have done so using either across-the-board adjustments for all women or individualized salary adjustments that are proportional to estimated disparities. As noted by Toutkoushian and Hoffman (2002) and others, the salary adjustments received by women and the cost to the institution can vary depending on the approach used to measure female pay disparities.

Although not as prevalent, there have been some recent instances where male faculty have also initiated lawsuits against universities for pay discrimination. In these lawsuits, male faculty have claimed—with some degree of success—that the process used by their institutions to make salary adjustments for females was unfair and has led to reverse pay discrimination. Despite the obvious importance to institutions, there is no discussion in the literature about the legal merits of these claims or of how the approach used by an institution to address pay inequities for females can affect the likelihood of a reverse discrimination suit filed by males being successful.

In this study, we focus exclusively on the issue of reverse discrimination claims by men. Reverse discrimination claims typically arise after institutions make pay adjustments to female faculty. While these adjustments have clearly helped to improve the pay status of female faculty,

they have also invited criticisms from male faculty. In particular, male faculty in several prominent cases have argued against these equity adjustments and that the methods used by institutions to adjust the salaries of underpaid female faculty should have been applied to them as well. Ironically, perhaps, men have turned to the same legislation—Title VII and the Equal Pay Act—that women have as justification for filing reverse discrimination claims regarding the pay equity plans implemented by institutions (see *Ende v. Board of Regents*, 1985; *Rudebusch v. Hughes*, 2002; *Smith v. Virginia Commonwealth University*, 1996).

In order to reduce the likelihood of reverse discrimination lawsuits, universities need to carefully consider the unintended consequences of alternative approaches for making pay adjustments. There are a wide variety of options that institutions can take to make salary adjustments for females, including across-the-board salary increases for all females or individualized salary adjustments based on a female's valued characteristics such as rank and experience (Arvey and Holt, 1988; Becker and Toutkoushian, 1995; Coller, Harrison, and Rutherford, 1996; Oaxaca and Ransom, 1994, 2002). These studies, however, focused exclusively on the cost of removing pay inequities for women, and do not consider the added cost that may be incurred if the same processes were applied to men.

While there have been relatively few reverse pay discrimination cases in academe to date, given that many institutions have conducted pay equity studies resulting in a number of salary adjustments for female faculty, there is the strong possibility that more claims of reverse sex discrimination in pay will emerge in the coming years. Legal cases and studies of pay discrimination often devote considerable discussion to the choice of factors used as control variables when measuring the pay disparity between the genders (Barbezat, 1989; Ferber and Loeb, 2002; Ransom and Megdal, 1993). However, even after decisions have been made about the variables to use in the salary model and how they should be measured, little attention is given to details such as how salary adjustments should be made and the implications of this decision. It has been shown elsewhere (Becker and Toutkoushian, 1995; Oaxaca and Ransom, 2002; Toutkoushian, 1994) that holding constant the specification of the salary model, the cost of removing pay inequities for females can vary dramatically depending on how it is done.

A related aspect that has not been addressed in the literature, however, is that after deciding which control factors to use in a pay equity study, the method used for removing pay inequities for females can also have an impact on the likelihood of male faculty claiming that the process was discriminatory towards them (see generally *Ende v. Board of*

Regents, 1985; *Rudebusch v. Hughes*, 2002; *Smith v. Virginia Commonwealth University*, 1996). In examining some of the legal and statistical issues surrounding claims of reverse sex discrimination, we begin by reviewing the way in which legal cases examine sex discrimination in pay in academe, and the different approaches that institutions can take to remove pay disparities for women. In particular, we focus on the potential impact that different options for making salary adjustments for females may have on the way in which male faculty perceive they are treated. We argue that it is important to simulate the effects on both males and females of various salary adjustments plans. Our analysis shows that across-the-board options are less likely than individualized methods to raise concerns about the salary determination process and possibly reverse discrimination, and result in lower costs to the institution for making equity adjustments for both men and women. These differences arise regardless of the salary model specification used by an institution when making salary adjustments. Finally, we use a salary model developed by one institution for an internal salary equity study to demonstrate the effects of using different adjustment methods on the total cost to the institution when making salary equity adjustments for both genders.

MEASURING FEMALE PAY INEQUITIES

The legal foundation for pay equity studies in academe can be traced back to the Equal Pay Act of 1963 and Title VII of the Civil Rights Act of 1964. Title VII of the Civil Rights Act of 1964 prohibits employers from discriminating on the basis of race, color, religion, national origin or sex (42 U.S.C. § 2000e-2(a)(1))[2] and forbids discrimination "against any individual with respect to his compensation ... because of such individual's ... sex" (42 U.S.C. § 2000e-2(a)(1)). Title VII also makes it illegal for an employer "to limit, segregate, or classify his employees ... in any way which would deprive or tend to deprive any individual of employment opportunities or otherwise adversely affect his status as an employee...." (42 U.S.C. 2000e-2(a)(2)). This particular section of the statute relates to wage discrimination (Giampetro-Meyer, 2000). The U.S. Supreme Court has interpreted the language of Title VII as a prohibition "not only [against] overt discrimination, but also practices that are fair in form, but discriminatory in operation" (*County of Washington v. Gunther*, 1981, p. 170). When bringing a Title VII claim, then, plaintiffs need to establish "the existence of a discriminatory hiring pattern and practice" (*Franks v. Bowman Transportation Company*, 1976, p. 772). Proof of such a claim requires the plaintiffs to show a practice

or pattern, as opposed to an "isolated or 'accidental' or sporadic discriminatory acts" (*Melani v. Board of Higher Education*, 1983, p. 773). More specifically, the plaintiff in a Title VII case must prove that the plaintiff was a member of a protected class, the plaintiff was meeting the employer's legitimate expectations, the plaintiff suffered an adverse employment action, and the employer treated a similarly situated employee of the opposite sex more favorably (*Cullen v. Indiana University Board of Trustees*, 2003).

Although Title VII prohibits wage discrimination in general, the Equal Pay Act focuses on equal pay for substantially equal work (Perez-Arrieta, 2005). Claims under the Equal Pay Act generally arise when a man and woman perform substantially equal work for unequal pay (Brake, 2000). The Equal Pay Act (29 U.S.C. § 206(d)(1)) provides that:

> "No employer having employees subject to any provisions of this section shall discriminate, within any establishment in which such employees are employed, between employees on the basis of sex by paying wages to employees in such establishment at a rate less than the rate at which he pays wages to employees of the opposite sex in such establishment for equal work on jobs the performance of which requires equal skill, effort, and responsibility, and which are performed under similar working conditions..."

A plaintiff that brings an Equal Pay Act claim must prove that a wage differential was based upon sex and that there was the performance of equal work for unequal compensation. While the jobs in question need not be identical, they must be substantially equal (*Jacobs v. College of William and Mary*, 1980). The plaintiff must demonstrate that the jobs being compared are substantially equal based upon "actual job performance and content—not job titles, classifications, or descriptions" (*Markel v. Board of Regents of the University of Wisconsin System*, 2002, p. 913). In order to establish an Equal Pay Act case, the plaintiff must prove that higher wages were paid to an employee of the opposite sex; that there was equal work requiring substantially similar skill, effort, and responsibilities; and that the work was performed under similar working conditions (*Cullen v. Indiana University Board of Trustees*, 2003). Once the plaintiff establishes that a case can be made for possible wage discrimination, the burdens shift to the defendant to show that the wage differential is excused under one of four defenses (*Ende v. Board of Regents*, 1985; Hamburg, 1989).

The Equal Pay Act permits an employer to justify a wage disparity between the sexes if the differential in pay results from: (i) a seniority system; (ii) a merit system; (iii) a system which measures earnings by quantity or quality of production; or (iv) a differential based on any other factor other than sex. These affirmative defenses have also been

incorporated under Title VII's prohibition against wage discrimination based on gender through the Bennett Amendment (42 U.S.C.S. § 2000e-2(h)). Because the other-than-sex exception is rather broad, it has been the subject of litigation (see Perez-Arrieta, 2005). One court described this exception as a "broad 'catch-all' exception [that] embraces an almost limitless number of factors, so long as they do not involve sex" (*Dey v. Colt Construction and Development Company*, 1994, p. 1462). Keohane (1997) notes that the Equal Pay Act does not define the scope of the defense; nor does it state a standard for determining what qualifies as appropriate factors other than sex. The confusion over this defense has led courts to consider statements of peer judgments, collegial relationships, and individual merit when determining whether the other-than-sex defense applies in Equal Pay Act disputes (Keohane, 1997). Such has been the case with universities, which often rely on the other-than-sex exception defense in pay equity cases (29 U.S.C. § 206(d)(1)). In addition to the Equal Pay Act, other cases in academe have also focused on Title VII. The U.S. Supreme Court has not yet examined the Title VII or the Equal Pay Act parameters for analysis of adjustments made to achieve pay equity in universities. However, the U.S. Supreme Court's affirmative action decision in *Johnson v. Transportation Agency* (1987) provides some guidance in pay equity litigation under Title VII. Although the *Johnson* case was not directly on point, it has been relied on in the analysis of a few pay equity cases.

Because Title VII and the Equal Pay Act have been broadly interpreted, their intentions have been at the core of pay equity cases for both genders (e.g. *Board of Regents v. Dawes*, 1975; Luna, 2006; *Lyon v. Temple University*, 1982). Legal scholars have argued that Title VII was intended to have a broad remedial purpose (Brown, 1995). This was evident when the U.S. Supreme Court reasoned that Title VII had the broad purpose of prohibiting "all practices in whatever form which create inequality in employment opportunity due to discrimination on the basis of race, religion, sex, or national origin" (*Franks v. Bowman*, 1976, p. 763). In contrast, the Eighth Circuit noted that the Equal Pay Act was narrowly focused on the problem of wage differentials based on sex and its "broad remedial purpose is the elimination of sexual discrimination against women" (*Schultz v. American Can Co.-Dixie Products*, 1970, p. 360). The court reasoned in this case that the Equal Pay Act "sought to overcome the age-old belief in women's inferiority and to eliminate the depressing effects on living standards of reduced wages for female workers and the economic and social consequences which flow from it" (*Schultz v. American Can Co.-Dixie Products*, 1970, p. 360).

The Equal Pay Act and Title VII have led to numerous claims of pay discrimination across labor markets. An Equal Employment Opportunity Commission and state fair employment practices agencies study revealed that there have been 5357 charges of gender-based discrimination in the workplace (Euben, 2001). These cases include not only pay discrimination but also discrimination in hiring and other work practices. We conducted a similar search within the major legal databases, Lexis-Nexis and Westlaw, and found that there have been over 300 cases of gender-based discrimination in the academic workplace, and over 100 of these cases were focused specifically on pay discrimination in higher education. Not surprisingly, the vast majority of pay discrimination cases in academe have been raised on behalf of female faculty. Recent cases at St. Cloud State University, the University of Cincinnati, and the University of South Florida illustrate that pay discrimination proceedings are still being brought by female professors. These findings are not surprising considering reports showing that female faculty, on average, still earn substantially less than male faculty (Ehrenberg, 2003; Euben, 2001; Toutkoushian and Conley, 2005).

In these cases, multiple regression analysis has often been used to determine if females are paid less than comparable males, and if so, to determine how much money is needed to remove pay disparities (see *Maitland v. University of Minnesota*, 1998; *Melani v. Board of Higher Education*, 1983; *Smith v. Virginia Commonwealth University*, 1996). Regression analysis is a statistical application used to estimate the relationship between a faculty member's salary and a series of control variables such as years of service, discipline, and rank. A regression model can isolate the effects of gender on salary after controlling for specific factors, and thus is an ideal tool for examining the other-than-sex exception of the Equal Pay Act. The salary model can also be used to predict what a faculty member's salary should be, given the legitimate factors identified by the court, and then measure the difference to the person's actual salary (*Rudebusch v. Hughes*, 2002).

Most plaintiffs in pay discrimination cases use regression analysis to provide evidence about a university's practice of pay discrimination, while universities tend to criticize the plaintiff's regression models as incomplete or inaccurate (McKeown, 1992). The regression analyses begin with the specification of a salary model of the form:

$$Y_i = \beta_0 + \sum_{j=1}^{J} \beta_j X_{ji} + \varepsilon_i \quad (1)$$

where Y = salary, X_1 to X_J = set of J factors deemed legally appropriate for affecting salary, β_0 to β_J = set of coefficients to be estimated, and ε = random error term.[3] In the case of *Bazemore v. Friday* (1986), the U.S. Supreme Court reasoned that "it is clear that a regression analysis that includes less than 'all measurable variables' may serve to prove a plaintiff's case" (*Bazemore v. Friday*, 1986, pp. 400–401). The Supreme Court in this case reasoned that multiple regression analysis should have been admitted, even though the omission of variables from a regression analysis may render the analysis less probative than it otherwise may have been (McKeown, 1992). After the *Bazemore* decision, the courts became more accepting of regression analysis as a tool to help resolve legal disputes in pay equity cases (Rubinfeld, 1985; Luna, 2006).

After selecting the factors to use in the salary model, analysts must decide how to use the results to measure pay disparities for women. In the single-equation approach, a dummy variable for gender (G = 1 if female, 0 if male) is added to the salary model:

$$Y_i = \beta_0 + \sum_{j=1}^{J} \beta_j X_{ji} + \beta_{J+1} G_i + \varepsilon_i \tag{2}$$

and the estimate of the coefficient β_{J+1} represents the average amount by which female faculty are underpaid relative to comparable male faculty. This is referred to here as the average unexplained wage gap (UWG).

The multiple-equation approach for measuring pay inequity relies on the specification of three wage structures: what males currently receive for each factor in the model (β_{M0} to β_{MJ}), what females currently receive for each factor in the model (β_{F0} to β_{FJ}), and what all faculty would receive for each factor in the absence of discrimination (β_{N0} to β_{NJ}). For more details on these methods, see Oaxaca (1973), Reimers (1983), and Neumark (1988):

$$Y_{Mi} = \beta_{M0} + \sum_{j=1}^{J} \beta_{Mj} X_{Mji} + \varepsilon_{Mi} \quad \text{males only} \tag{3.1}$$

$$Y_{Fi} = \beta_{F0} + \sum_{j=1}^{J} \beta_{Fj} X_{Fji} + \varepsilon_{Fi} \quad \text{females only} \tag{3.2}$$

$$Y_{Ni} = \beta_{N0} + \sum_{j=1}^{J} \beta_{Nj} X_{Nji} + \varepsilon_{Ni} \quad \text{pooled model} \tag{3.3}$$

As noted in the case law, it is often presumed that discrimination arises solely from female faculty being underpaid, meaning that the male wage structure is the same as the no-discrimination wage structure ($\beta_N = \beta_M$). The average unexplained wage gap in the multiple-equation model for females can then be expressed as the mean of the unexplained wage gaps (UWG) for female faculty, as in

$$\begin{aligned} \text{Average UWG} &= \frac{1}{N_F} \sum_{i=1}^{N_F} \sum_{j=0}^{J} (\beta_{Mj} X_{ij} - \beta_{Fj} X_{ij}) \\ &= \hat{Y}(\text{average female as male}) - \hat{Y}(\text{average female as female}) \end{aligned} \tag{4}$$

where $\hat{Y}_i$ (average female as male) = average predicted salary for females if paid according to the factor weights that apply to males, and $\hat{Y}_i$ (average female as female) = average predicted salary for females if paid according to the factor weights that apply to females. The average UWG could also be found by subtracting the average actual salary for females from the average predicted salary for females if paid as males.[4]

OPTIONS FOR REMOVING FEMALE AND MALE PAY INEQUITIES

In both the single- and multiple-equation approaches, the average UWG often becomes the basis for not only determining whether female faculty are paid less than their male counterparts but also for calculating the amount of money needed to remove the average pay disparity between the genders. These adjustments could be made on an across-the-board basis, where every female faculty member receives the same salary adjustment, or on an individualized basis. In the latter case, the size of the salary adjustment can vary depending on the perceived level of pay inequity for each female faculty member. In some instances, such as at the University of Minnesota, female faculty received both an across-the-board and an individualized salary adjustment (*Maitland v. University of Minnesota*, 1998).

In the single-equation approach, each female's salary is increased by the magnitude of the gender coefficient β_{J+1} from Eq. (2):

$$\text{Adj(1a)} = \hat{Y}(\text{average female as male}) - \hat{Y}(\text{average female as female}) = \beta_{J+1} \tag{5.1a}$$

In this instance, each female's salary is increased by the difference between the average predicted salary for females if paid as males and the average predicted salary for females if paid as female. This is the simplest procedure to implement.

The multiple equation approach can also be used for making across-the-board salary adjustments, where each female faculty member's salary is increased by the differences in predicted salaries arising from the separate equations for males and females:

$$\begin{aligned}\text{Adj(1b)} &= \sum_{j=0}^{J}(\beta_{Mj} - \beta_{Fj})*\overline{X}_j \\ &= \hat{Y}(\text{average female as male}) - \hat{Y}(\text{average female as female})\end{aligned} \tag{5.1b}$$

While the adjustments could also be made in the single- or multiple-equation methods as follows:

$$\text{Adj(2)} = \hat{Y}(\text{average female as male}) - \overline{Y}(\text{female}) \tag{5.2}$$

the adjustments would be the same for everyone when actual salary and not the log of salary is used as the dependent variable in earnings equations since $\hat{Y}(\textbf{average female as female}) = \overline{Y}(\textbf{female})$. The across-the-board salary increase would then raise the intercept for the female wage structure so that a recomputation of the salary model would show that the average unexplained wage gap is now zero. Each female's new salary would be the sum of her predicted salary as if female, her residual from the female salary equation, and the equity adjustment in Eq. (5.1) or (5.2). However, the adjustments from Adj(1a) can differ from Adj(1b) in the single- and multiple-equation methods because the average predicted salaries are based on different regression models.

While the across-the-board approaches are straightforward and effective at eliminating the average unexplained wage gap, they have been criticized for giving the same salary adjustments to all females regardless of the extent to which they might be underpaid relative to males. As a result, institutions may opt to implement individualized salary adjustments, where the magnitudes of salary adjustments for females are permitted to differ depending on their estimated level of underpayment.

To see the different options that exist for removing individual-specific inequities, we use Eq. (1) to write expressions for how to make individualized salary adjustments for female faculty:

$$\text{Adj}(3) = \hat{Y}_i(\text{female as male}) - Y_i \tag{5.3}$$

$$\text{Adj}(4) = \hat{Y}_i(\text{female as male}) - \hat{Y}_i(\text{female as female}) \tag{5.4}$$

In Adj(3), each female's salary is adjusted by the difference between her current salary and what she would be predicted to receive if male. The fourth option, Adj(4), specifies that each female should receive the difference between what she would be predicted to earn if male and what she would be predicted to earn based on the salary model for females.

There are several important differences in these options that could have implications for the total cost to an institution of making equity adjustments. First, since political constraints would make it nearly impossible to impose salary reductions for females when Adj(3) or Adj(4) are negative, the total cost to the institution of making individualized salary adjustments will be greater than for making across-the-board salary adjustments using the same salary models. Second, note that Adj(3) relies on actual salaries for females whereas Adj(4) utilizes the predicted salaries of females. Since the distribution of predicted salaries is generally less variable than the distribution of actual salaries, Adj(3) would usually lead to higher costs than Adj(4) to the institution.

There is another very subtle, but important, difference between these two individualized approaches to making salary adjustments for females. In Adj(3), every female's new salary will now be equal to her predicted salary as a male. This is not true in the fourth option because the base for making adjustments is a female's predicted salary as female, which may be higher or lower than her actual salary. In this approach, the female's new salary may be above or below her predicted salary as a male because the residual (e_i) is retained in her salary.

It is also possible to generalize these salary adjustment approaches to both gender. By doing so, we can illustrate why individualized processes are more likely than across-the-board processes to raise concerns of reverse discrimination among male faculty. To see why this is true, we now write the four salary adjustment options in gender-neutral terms and add a fifth option:

$$\text{Adj}(1) = \hat{Y}_i(\text{average as male}) - \hat{Y}_i(\text{average as own gender}) \tag{6.1}$$

$$\text{Adj}(2) = \hat{Y}_i(\text{average as male}) - \overline{Y}(\text{as own gender}) \tag{6.2}$$

$$\text{Adj}(3) = \hat{Y}_i(\text{as male}) - Y_i \tag{6.3}$$

$$\text{Adj}(4) = \hat{Y}_i(\text{as male}) - \hat{Y}_i(\text{as own gender}) \tag{6.4}$$

$$\text{Adj}(5) = \hat{Y}_i(\text{as other gender}) - \hat{Y}_i(\text{as own gender}) \tag{6.5}$$

In the first two options, a strict application of the formula for males would result in no salary increases for them because their average salary would equal their average predicted salary as if male. Therefore, under an across-the-board salary adjustment process, male faculty would have difficulty claiming that the same process could have been applied to them. For the third option, because a substantial proportion of male faculty (approximately half) would have actual salaries that are below their predicted salaries according to the all-male earnings equation, some male faculty might be able to claim that they are entitled to salary increases if the process in Adj(3) was used to make salary adjustments for females. In the fourth case, the salary adjustments by definition would equal zero for each male since every male's predicted salary as male would equal their predicted salary for their own gender (male). It is crucial to note that these results hold regardless of the variables used in the salary model. Finally, it might be argued that if the predicted salaries of some males fall below their predicted salaries according to the all-female wage equation, then this is also a form of gender-based pay discrimination, and males should be entitled to these salary adjustments. Accordingly, a fifth option for making salary adjustments (Adj(5)) calls for each male to receive a salary adjustment when his predicted salary as male is less than his predicted salary as female. Since there are likely to be some male faculty whose predicted salaries as male are below their predicted salaries as female, Adj(5) may lead some males to claim that this salary process leads to reverse discrimination if it were not applied to them as well.

LEGAL CLAIMS BY MALES AGAINST SALARY ADJUSTMENT PROCESSES

Although there is no U.S. Supreme Court decision that specifically addresses male faculty claims against salary adjustment processes, there are a few circuit court decisions that do so. Among the circuit court cases, there is some conflict. Sometimes when federal circuit courts are in conflict with one another, the U.S. Supreme Court agrees to hear the case in order to settle the issue. If the pay equity issue conflict continues, perhaps the Supreme Court will step in to provide guidance for

courts and universities confronted with this issue. Until this occurs, the methods for measuring and removing pay inequities will continue to be debated.

While the methods for measuring and removing female pay inequities have been explored in the literature, little attention has been given to the possible unintended consequences for males that can arise from the way in which salary adjustments are made for females. Male faculty have challenged the salary adjustments made for their female colleagues to address equity concerns by questioning the regression model specification used to compute pay inequities. In several instances, however, male faculty members have gone so far as to initiate claims of reverse discrimination based on the way that their institutions implemented equity adjustments for female faculty.

Two Equal Pay Act cases addressed reverse discrimination in pay equity. In one case, the court found that the university's plan constituted unlawful discrimination (*Board of Regents v. Dawes*, 1975). In this case, the male professors argued that the university's voluntary affirmative action efforts treated the genders differently by not applying the same formula to males to set their level of pay. The Eighth Circuit agreed and reasoned that the university should not have used the formula for one sex but not the other.

In contrast, the Seventh Circuit upheld the University's salary adjustment plan that was implemented to remedy past discrimination (*Ende v. Board of Regents*, 1985). In *Ende*, the University's investigation revealed that, based on a multiple regression analysis, the aggregate amount of the discrepancy between annual salaries of male and female faculty members was approximately $150,000. Accordingly, the University created a salary formula that would, in the aggregate, pay female faculty members an additional $150,000 on a yearly basis.

The district court noted that the *Board of Regents v. Dawes* (1975) decision had significantly different facts from this case. The Seventh Circuit agreed finding the University's plan to be a valid "factor other than sex" because the university plan created isolated instances between males and females (*Ende v. Board of Regents*, 1985, p. 182). Specifically, the court stated that:

> "...we think that an increase which restores a victim of past discrimination to the salary level he/she would have enjoyed in the absence of the discrimination qualifies as defense (iv) even where the discrimination itself was based on sex. To conclude otherwise would create a wholly unnecessary tension between compliance with the anti-discrimination provisions of Title VII (and of the Equal Pay Act itself) with the Equal Pay Act" (*Ende v. Board of Regents*, 1985, pp. 182–183).

The court further reasoned that such an incremental adjustment to females' salary was needed to remedy the effects of past discrimination. The court also stated that the issue of whether such a plan unnecessarily trammels the interests of male faculty does not arise unless particular female faculty members were paid more than necessary to alleviate the pay imbalance attributable to gender. Thus, in this case, the pay equity formula brought females to a "salary level they would have reached in ordinary course if they had been men and not subjected to sex discrimination. It makes no sense to apply the formula to men in this context" (p. 181). The court also noted that the marketplace factor was one possible weakness of the formula used in the equity adjustment. The court stated that faculty members of any rank may command a higher salary in some departments than others. In an example, the court pointed out the difference in salary between an Elementary Education professor and a Business professor. Using this example, the court reasoned that the formula used by the university treated female faculty members of any rank alike for all departments. The equity adjustment, therefore, may have resulted in women in a higher paying department receiving a lower adjustment than they should have.

When courts analyze Title VII cases, some look to the *Johnson v. Transportation Agency* (1987) affirmative action decision. When applying *Johnson*, courts examine the following three factors: manifest imbalance, unnecessary trammeling, and adjustments necessary to obtain a balance (see *Rudebusch v. Hughes*, 2002). In addition, the *Johnson* (1987) decision also noted that once a plaintiff demonstrates that sex has been taken into account in an employer's employment decision, the burden shifts to the employer to articulate a nondiscriminatory rationale for its decision. The employer can establish such a rationale by pointing to an existing affirmative action plan. In other words, if such a plan is articulated as the basis for the employer's decision, the burden shifts back to the plaintiff to prove that the employer's justification is pretextual and that the plan is invalid. It is important to note that when bringing a prima facie Title VII claim, plaintiffs must be willing to prove intentional discrimination or disparate treatment. Proof of such discrimination can be difficult.

In a Title VII case, the Fourth Circuit relied on the *Johnson* analysis when male faculty challenged a university's salary adjustment process for female faculty (*Smith v. Virginia Commonwealth University*, 1996). The University had studied its pay structure to determine whether female professors were victims of sex-based discrimination. The study controlled for differences such as doctoral degrees, academic rank, tenure status, number of years of university experience and the number of

years of prior academic experience. Finding a disparity among salaries, the university approved more than $440,000 to increase female faculty salaries.

The Fourth Circuit noted that a voluntary affirmative action plan does not violate Title VII if the plan's purpose is to break down old patterns of discrimination; the plan does not unnecessarily trammel the rights of those outside the group that the plan is designed to protect; and the plan is designed to eliminate a manifest racial or sexual imbalance. The Fourth Circuit did, however, reverse the district court's decision because of the statistical disparity between female and male salaries where the university's multiple regression analysis failed to account for performance related variables that were important to the validity of the study to establish a manifest imbalance. In so doing, the court noted that "*Bazemore* and common sense require that any multiple regression analysis used to determine pay disparity must include all the major factors on which pay is determined" (*Smith v. Virginia Commonwealth University*, 1996, p. 676). Regarding regression analysis, the court in *Smith* did not take the same approach as the court did in *Ende*. Perhaps the *Bazemore* decision that was issued between the time of the *Ende* decision and the *Smith* decision caused confusion regarding the appropriate variables to use in a regression model. In *Smith*, the court relied on *Bazemore* to demonstrate that the regression model used by the university did not have key variables in it. In so doing, the court reasoned that the university's multiple regression analysis failed to account for important performance related variables that were crucial to the validity of the study in establishing a manifest imbalance.

The Eighth Circuit ruled in favor of the University in a similar Title VII lawsuit (*Maitland v. University of Minnesota*, 1998). In this case, a regression model was used to determine that female faculty were paid approximately 6% less than comparable male faculty. To eliminate this disparity, the University awarded female faculty an across-the-board salary increase of 3%, an additional increase proportional to the difference between each female's actual and predicted salary (2.5% average), and the remaining one-half of one percent was distributed to faculty who successfully petitioned the University for a larger increase. A male faculty member argued that had the University's salary adjustment plan been applied to him, then he would have also received a salary increase since his actual salary was lower than his predicted salary from the regression model. Because any academic employee, including male employees, was permitted to file a claim in order to seek a salary increase under the settlement, the court noted that the male faculty

member plaintiff in the case "did not avail himself of this opportunity" (*Maitland v. University of Minnesota*, 1998, p. 1015).

Unlike the previous two decisions that applied the *Johnson v. Transportation Agency* (1987), the court in *Rudebusch v. Hughes* (2002) viewed the *Johnson* decision in a different light. Specifically, the court in *Rudebusch* (2002) found the *Johnson* decision to have some significant conceptual differences because it was a case about affirmative action in the promotional context. After noting the difference, however, the court did examine the three factors laid out in the *Johnson* decision: manifest imbalance, unnecessary trammeling and adjustments necessary to obtain a balance.

In this Ninth Circuit case, the University also prevailed against male faculty members alleging reverse discrimination (*Rudebusch v. Hughes*, 2002). In *Rudebusch*, several white male professors at the University alleged a Title VII violation because the university failed to make pay adjustments for the white male professors, whose salaries were also below their predicted salaries from the same regression model. In analyzing whether the pay adjustments unnecessarily trammeled the rights of the male professors, the court noted that under the male professors' arguments there could never be any catch-up adjustments for females or minorities without a simultaneous adjustment of the entire faculty. Such a plan resulted in the "perpetuation, not elimination of pay disparity" (*Rudebusch v. Hughes*, 2002, p. 523).

AN APPLICATION

We now apply these approaches to faculty salary data from a single institution to show how the female and male salary adjustments differ across methods. The institution is a large, public, comprehensive institution that offers over 200 graduate degree programs, and is classified as a research-extensive university by the Carnegie Foundation's classification system. The dataset consists of approximately 1300 tenured and tenure-eligible faculty members from a single year at the institution. The dataset was used by the plaintiffs as part of a pay equity lawsuit to determine if female faculty were paid less than comparable male faculty. For the purpose of demonstration, we used the same independent variables that were used in this study, which include controls for highest degree, academic rank, years of previous experience and years of previous experience squared, years at the institution and years at the institution squared, length of academic appointment, and 114 dummy variables for academic department. The dependent variable is the annualized base salary for each faculty member. With the possible exception of academic

rank, which has been criticized by some as being tainted by gender bias in promotion (Becker and Toutkoushian, 2003), the variables used in the study are consistent with those used in many other institutional studies (see Barbezat, 2002; Becker and Toutkoushian, 2003; Ferber and Loeb, 2002; Ransom and Megdal, 1993). As we noted earlier, however, the choice of variables used in the salary model will not affect whether male faculty would be entitled to salary adjustments according to the alternatives we described here, nor will it affect the relative size of the cost of removing inequities for males and females. At the same time, the salary model specification could have a bearing on the absolute size of the salary adjustments to be awarded to male and female faculty. Table 1 provides descriptive statistics for the key variables in our analysis:

The data reveal that male faculty at the institution on average earn $13,046 more than female faculty. There is also reason to believe that some portion of the average pay gap is due to non-gender based factors that should affect compensation. On average, male faculty are more likely than their female counterparts to possess a doctorate degree and/or be employed at the Full Professor rank. Likewise, male faculty average approximately three more years of experience than females at the institution.

We began by estimating the same pooled salary equation and separate salary equations for male and female faculty used by the plaintiffs in the

TABLE 1. Descriptive Statistics for Selected Variables

	Male faculty		Female faculty	
Variable	Mean	Std. Dev.	Mean	Std. Dev.
Salary	68,073	20,472	55,027	15,384
Doctorate degree	.76	–	.61	–
Professional degree	.03	–	.03	–
Current experience	16.88	10.88	13.85	9.74
Prior experience	8.96	6.69	10.26	7.03
Full Professor	.48	–	.28	–
Associate Professor	.34	–	.41	–
Instructor	.002	–	.02	–
Sample size	889		439	

Notes: Salary = annual base salary. Doctorate degree = 1 if highest degree is doctorate, 0 otherwise. Professional degree = 1 if highest degree if Professional degree, 0 otherwise. Current experience = years at the institution. Prior experience = estimated years of experience prior to being employed by the institution (defined as years since highest degree minus Seniority). Full Professor = 1 if Full Professor, 0 otherwise. Associate Professor = 1 if Associate Professor, 0 otherwise. Instructor = 1 if Instructor, 0 otherwise.

lawsuit. The coefficients for selected variables from each model are reported in Table 2.

The results from the multiple regression analysis shows that faculty rank has a very large influence on an individual's predicted salary at this institution. The models each explain between 78 and 90 percent of the variations in salaries for faculty. Of the independent variables used in the analysis, current academic rank has the largest effect on salaries. It should be noted that the estimated coefficients on the various regressors in the model differ across the three equations. This is important because it will lead to differences in predicted salaries for individuals from each of the models and hence different estimates of financial damages.

The results from these equations can be used to estimate the unexplained wage gaps between the genders. In the single-equation model, female faculty on average earn approximately $1854 less than male

TABLE 2. Regression Results for Male and Female Salary Models

	Estimated coefficients		
Variable	Pooled model	Male only	Female only
Doctorate degree	−1613.50 (1008.1)	−2293.48 (1441.4)	−818.11 (1081.2)
Professional degree	−1621.03 (2504.9)	−4560.26 (3874.3)	7214.3* (2832.9)
Current experience	209.55 (116.1)	279.70 (161.0)	−37.75 (131.3)
(Current experience)^2	6.85* (2.9)	5.26 (3.9)	15.63** (3.49)
Prior experience	17.72 (119.5)	35.01 (165.4)	140.61 (136.9)
(Prior experience)^2	14.91** (4.2)	20.84** (5.8)	−2.313 (4.8)
Full Professor	23168.84** (1082.2)	24339.44** (1578.5)	18188.49**
Associate Professor	7844.34** (894.6)	8372.14** (1320.1)	7381.03** (881.2)
Instructor	−2327.47 (3085.3)	−151.29 (7490.9)	−3431.77 (2156.6)
Female	−1854.42** (637.4)	–	–
Constant	40905.02** (3395.3)	39072.30** (4662.2)	46708.49** (3822.7)
R-squared	.81	.78	.90
# Observations	1,328	889	439

Notes: $^{**}p < .01$, $^{*}p < .05$, two-tailed test. Standard errors are shown in parentheses. The dependent variable is the annual base salary of each faculty member. Doctorate degree = 1 if highest degree is doctorate, 0 otherwise. Professional degree = 1 if highest degree if Professional, 0 otherwise. Current experience = years at the institution. Prior experience = estimated years of experience prior to being employed by the institution (defined as years since highest degree minus Seniority). Full Professor = 1 if Full Professor, 0 otherwise. Associate Professor = 1 if Associate Professor, 0 otherwise. Instructor = 1 if Instructor, 0 otherwise. Each regression model also contains controls for length of academic appointment (3 variables), whether highest degree is unknown, and department (114 variables).

TABLE 3. Average Salaries for Groups of Faculty

Category	Average for males	Average for females
Actual salary	$68,073	$55,027
Predicted salary as male	$68,073	$56,738
Predicted salary as female	$64,425	$55,027

Notes: Predicted salaries as male are obtained by substituting each faculty member's characteristics into the male-only equation in Table 2. Predicted salaries as female are obtained by substituting each faculty member's characteristics into the female-only equation in Table 2.

faculty. When the two-equation model is used, the average female faculty member would be predicted to earn $56,738 if paid as male, which exceeds their average female salary by $1711 (Table 3). Taken together, this means that about 85% of the average salary difference between male and female faculty is accounted for by differences in the other independent variables in the salary model. Nonetheless, a substantial unexplained wage gap between the genders remains after removing the effects of these factors.

Table 4 provides information on the distribution of unexplained salary differences for male faculty using the individualized adjustment methods 3 and 5 (Eqs. (6.3) and (6.5), respectively). Note from Table 4 that over half of the male faculty have actual salaries that fall below

TABLE 4. Frequency Distribution of Unexplained Salary Differentials for Male Faculty from Two Individualized Methods

Percentile	Adj(3): Predicted salary as if male minus actual salary	Adj(5): Predicted salary as if female minus predicted salary as if male
10th	−$10,181	−$15,934
20th	−$5,411	−$7,671
30th	−$2,767	−$5,346
40th	−$1,071	−$4,024
50th	+$811	−$2,345
60th	+$2,819	−$1,047
70th	+$4,489	+$733
80th	+$6,486	+$2,594
90th	+$9,700	+$5,357
Mean	$0	−$3,648
Median	+$811	−$2,345
# Positive difference	485	301

their predicted salaries as if male, and approximately one-third of male faculty have predicted salaries as if male that are lower than their predicted salaries as if female. These distributions are also shown graphically in Figs. 1 and 2.

In Table 5, we calculated the total salary increases that would have to be awarded to male and female faculty members using the alternative methods described by Eqs. (6.1) through (6.5). In each instance, we use the same set of control variables as shown in Table 2, and salary adjustments were only made when it would result in an increase in an individual's salary. Adjustment methods 1 and 2 are based on the difference in average actual and/or predicted salaries. In the first row, all female faculty receive an across-the-board salary increase equal to the estimated coefficient on the female variable ($1854) from the single-equation model. In the second row, each female receives a salary adjustment equal to the difference in average predicted salaries for females from the all-male and all-female equation ($1711). The third row replaces the average predicted salary from the all-female model with the average female salary. Since these two values will be equal in a linear salary model, they result in the same salary adjustments for all female faculty. Note that male faculty are not entitled to salary adjustments under these methods since

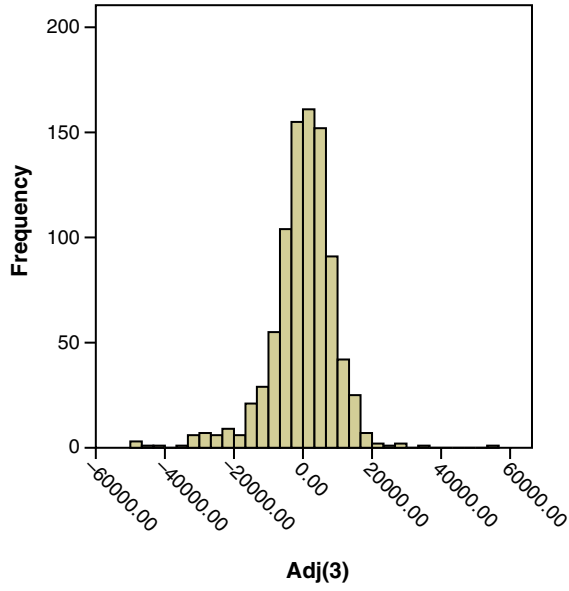

FIG. 1. Predicted salary as if male minus actual salary—males only [(Adj(3)].

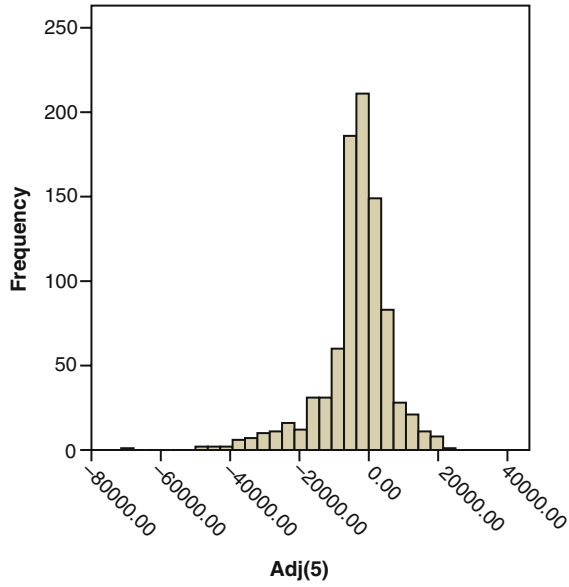

FIG. 2. Predicted salary as if female minus predicted salary as if male—males only [Adj(5)].

their average actual and predicted salaries for their own gender will equal the average predicted salary as male. In the fourth row, salary adjustments are awarded to male and female faculty when their actual salary is less than their predicted salary as male. The fifth row provides salary adjustments for individuals when their predicted salary for their own gender is less than their predicted salary as if male. By definition, these adjustments will be zero for all male faculty. Finally, in the last row salary adjustments are made when an individual's predicted salary for their own gender is below their predicted salary for the other gender. This introduces the possibility that some male faculty may be entitled to salary increases if their predicted salary as male is less than their predicted salary as female.

The first three rows document that when an across-the-board method is used to make salary adjustments for women, the resulting cost to the institution is notably lower than when individualized methods are used. This occurs because in the individualized methods, salaries cannot be reduced. Male faculty members would not be entitled to receive salary adjustments under any of the across-the-board methods because the average salary and average predicted salary for their gender—male—are the same as the average predicted salary as if male.

TABLE 5. Cost of Making Salary Equity Adjustments for Male and Female Faculty

Method	Total cost for males	Total cost for females	Total cost (male + female)
Average predicted salary as if male minus average predicted salary from own gender [Adj(1)]: Single-equation model	\$0 (n = 0)	\$813,906 (n = 439)	\$813,906 (n = 439)
Average predicted salary as if male minus average predicted salary from own gender [Adj(1)]: Two-equation model	\$0 (n = 0)	\$751,129 (n = 439)	\$751,129 (n = 439)
Average predicted salary as if male minus average actual salary [Adj(2)]: Two-equation model	\$0 (n = 0)	\$751,129 (n = 439)	\$751,129 (n = 439)
Predicted salary as if male minus actual salary [Adj(3)]	\$2,950,969 (n = 485)	\$1,848,016 (n = 257)	\$4,798,985 (n = 742)
Predicted salary as if male minus predicted salary from own gender [Adj(4)]	\$0 (n = 0)	\$1,560,825 (n = 245)	\$1,560,825 (n = 245)
Predicted salary from other gender minus predicted salary from own gender [Adj(5)]	\$1,480,795 (n = 301)	\$1,560,825 (n = 245)	\$3,041,620 (n = 546)

Notes: In Adj(3)–Adj(5), salary adjustments are only made when the differences are positive. Numbers in parentheses represent the number of faculty members who would receive salary adjustments using each method.

Turning to the individualized methods, when Adj(3) is used 59% percent of the females and 55% of the males would be entitled to salary adjustments since their actual salaries are below their predicted salaries as if male. This gives rise to the largest dollar total for the institutions, approximately $4.80 million. In the fourth option, males would not be entitled to any salary adjustments since their predicted salary based on their gender is the same as their predicted salary as if male. While slightly more females would be eligible for salary increases using this option, the total cost of adjusting female salaries is about $300,000 less. Taken together, the institution would be potentially liable for $1.56 million under this plan. Finally, if the salary adjustments are based on the differences in predicted salaries for the two genders, then a surprising number of males (approximately 34%) would still be eligible for salary increases because their predicted salary as males are less than their predicted salaries as females. The cost for females remains the same as in the fourth option, yielding a total cost of $3.04 million.

SUMMARY AND DISCUSSION

As more academic institutions conduct pay equity studies and implement salary adjustments for their female faculty in response to concerns about pay discrimination, more institutions risk the possibility of inviting claims against the salary adjustment process. If pay equity studies find that female faculty are earning less than their male counterparts, the universities may need to make adjustments. Especially in tight financial times, however, male faculty are likely to be critical of such adjustments on the grounds that the process used by the institution may not have been applied evenly across all faculty. These may lead to informal charges against the way in which the analysis was conducted, and in extreme cases, lead male faculty to file countersuits claiming that they have been subjected to reverse discrimination.

We show here that several prominent cases of reverse discrimination in pay have arisen in academe over the past 25 years, and contend that institutions need to carefully consider the legal and statistical implications of how they approach pay equity studies in order to reduce the chances of such claims arising on their campuses. While much attention has focused on the control variables that should be used in pay equity studies (e.g., Ferber and Loeb, 2002), and the ways in which salary disparities for females can be measured (e.g., Toutkoushian and Hoffman, 2002), virtually no discussion has arisen in the literature concerning how the salary adjustment process may raise concerns among male faculty of

reverse discrimination nor how these methods might be used to make similar salary adjustments for underpaid men.

We show here that although across-the-board methods for removing pay differentials for female faculty have not always been popular with analysts, they do have appeal in that they greatly reduce the chances of male faculty being able to successfully claim unequal treatment by the institution when salary adjustments are made. This occurs because it is more difficult for male faculty to argue that they would have been entitled to salary adjustments had the exact same procedure been applied to them. If universities used a more formulaic approach in making individual-specific pay adjustments for females, this process may raise concerns about reverse discrimination as evidenced in *Board of Regents v. Dawes* (1975), *Ende v. Board of Regents* (1985), *Maitland v. University of Minnesota* (1998), *Smith v. Virginia Commonwealth University* (1996), and *Rudebusch v. Hughes* (2002). As noted by Toutkoushian and Hoffman (2002), across-the-board salary adjustments for females also result in lower costs to the institution even though adjustments are made to more female faculty, some of whom may be earning more than their male counterparts. Here, we show that these cost differences are magnified when analysts take into account the possibility that male faculty may also be entitled to salary adjustments when individualized procedures are used. Likewise, by making the components of the salary determination process more transparent, an individualized salary adjustment process is more likely than an across-the-board salary adjustment to invite criticisms from male faculty.

In the empirical example we consider here, the individualized salary adjustments for females were nearly three times as large as when an across-the-board method was used. Within the individualized methods, an institution can be more successful at warding off claims of reverse discrimination if it uses predicted salaries according to one's gender, as opposed to actual salaries, as the starting point for computing salary adjustments. Not only will this reduce the amount of money to be paid to female faculty, but it can substantially reduce—or eliminate—the prescribed salary adjustments for males depending on the option used.

Whether a university adopts an across-the-board pay increase or a more individualized approach, there are important factors to consider. As noted, the main intent of this paper is to highlight the impact on males of the way in which pay equity adjustments are made in academe and to raise questions for debate regarding options for universities and courts involved in pay equity cases. The final decision on how to implement a salary adjustment plan for an institution will likely involve multiple factors in addition to the cost of removing salary inequities for

females and whether the plan leaves the institution vulnerable to charges of reverse discrimination. Likewise, regardless of how an institution corrects pay inequities when they are found, the possibility always exists that some faculty may challenge the legality of an institution's salary adjustment plan on grounds such as the misspecification of the salary model. The case law in this paper demonstrates that the courts tend to favor an individualized approach when adjusting female salaries in pay equity cases. As stated by the court in *Ende v. Board of Regents* (1985), the "incremental adjustment to females' salary was necessary to remedy the effects of past sex discrimination and eliminate sex as a determiner of salary" (p. 181). Likewise in *Rudebusch v. Hughes* (2002), the court noted that "the school must at some point ensure that the adjustments given are somehow correlated to individual merit" (p. 517). Further, as noted in this paper, the dissenting opinion in *Smith v. Virginia Commonwealth University* (1996) also stressed this point.

Although the courts have tended to favor this more individualized approach, such an approach may indeed bring more reverse pay discrimination cases by males. Specifically, an individualized approach for women makes it easier for men to argue that they have the same qualifications as some of the females who received an adjustment and they are therefore entitled to the same pay increase. This argument would be harder to make under an across-the-board approach. Under an across-the-board approach, it would be difficult for males to allege inequity if the adjustment was only related to correcting a gender pay imbalance for all female faculty. Hopefully, the approaches that we reviewed here will provide institutions with information about the possible impacts of different approaches to resolving pay inequities and thus select the most appropriate model to adopt in their specific situation. We therefore recommend that institutions should simulate the impacts of alternative salary adjustment plans on both male and female faculty before choosing an option to pursue.

END NOTES

1. While some plaintiffs have also brought their claims under 42 U.S.C. § 1981 (Section 1981), 42 U.S.C. § 1983 (Section 1983), or state anti-discrimination laws, the focus of this paper will be on the Equal Pay Act and Title VII.
2. In addition to litigation, the Equal Employment Opportunity Commission (EEOC) is the federal agency that administratively enforces the principal federal statutes prohibiting employment discrimination (42 U.S.C.A. § 2000e-5(a), 2002). Title VII is included in the list of principal statutes. Unlike the court system, the EEOC's regulatory powers are statutorily limited to only procedural issues (42 U.S.C.A. § 2000e-12(a), 2002). Before filing a Title VII case in court, claimants are required to demonstrate that they have complied

with the statutory and regulatory conditions first (*Jackson v. Seaboard Coast Line R.R. Company*, 1982).

3. Most salary studies use a semilogarithmic functional form for the earnings equation, where the natural log of salary is used as the dependent variable. In this paper, we use the linear form for ease of exposition. All of the methods described here can be applied to a semilogarithmic salary model by converting the predicted log of salary for each individual into his or her predicted salary. However, the nonlinear transformation introduces some subtle differences in the calculations. See Becker and Toutkoushian (1995) for more details on these complications and their effects in financial damage calculations.
4. In a salary model where Y = salary, these will yield identical results; however, when the salary model uses Y = natural log of salary, the results will be slightly different because of the skewness of the salary distribution.

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